Full wwPDB X-ray Structure Validation Report (i)

Aug 14, 2023 – 06:11 pm BST

PDB ID	:	8AQ6
Title	:	NanoLuc luciferase with bound furimamide in surface allosteric site
Authors	:	Nemergut, M.; Marek, M.
Deposited on	:	2022-08-11
Resolution	:	1.69 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the (i) symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

The following versions of software and data (see references (i)) were used in the production of this report:

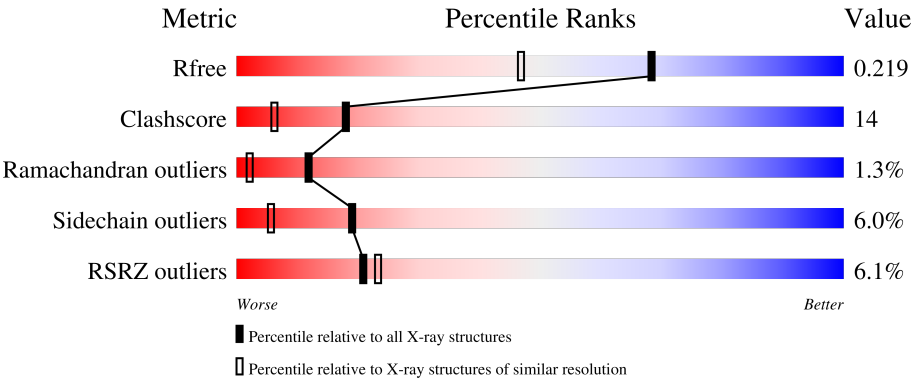
MolProbity	:	4.02b-467
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.35
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.35

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 1.69 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



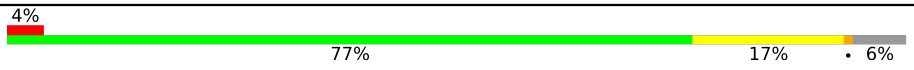
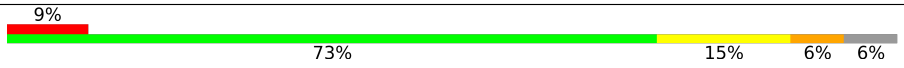
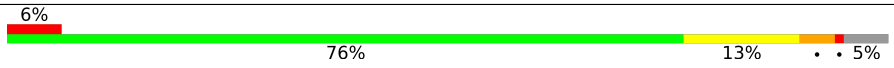
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	4298 (1.70-1.70)
Clashscore	141614	4695 (1.70-1.70)
Ramachandran outliers	138981	4610 (1.70-1.70)
Sidechain outliers	138945	4610 (1.70-1.70)
RSRZ outliers	127900	4222 (1.70-1.70)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	181	6% 61% 27% 6% • 6%
1	B	181	4% 72% 20% • 6%
1	C	181	% 69% 21% • 6%
1	D	181	9% 74% 17% • • 6%
1	E	181	8% 62% 27% • • 6%

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
1	F	181	
1	G	181	
1	H	181	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	GOL	H	201	-	-	X	-
3	PG4	A	204	-	-	X	-
3	PG4	E	201	-	-	X	-
4	OXY	A	205	-	-	X	-
7	NT0	G	301	-	-	X	-

2 Entry composition (i)

There are 8 unique types of molecules in this entry. The entry contains 11762 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called NanoLuc luciferase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	171	Total	C	N	O	S	0	1	0
			1355	874	226	250	5			
1	B	171	Total	C	N	O	S	0	0	0
			1349	871	225	249	4			
1	C	171	Total	C	N	O	S	0	0	0
			1349	871	225	249	4			
1	D	171	Total	C	N	O	S	0	1	0
			1355	874	226	250	5			
1	E	171	Total	C	N	O	S	0	0	0
			1349	871	225	249	4			
1	F	171	Total	C	N	O	S	0	1	0
			1357	876	228	249	4			
1	G	171	Total	C	N	O	S	0	1	0
			1355	874	226	250	5			
1	H	172	Total	C	N	O	S	0	0	0
			1357	875	227	251	4			

There are 224 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-11	MET	-	initiating methionine	UNP Q9GV45
A	-10	HIS	-	expression tag	UNP Q9GV45
A	-9	HIS	-	expression tag	UNP Q9GV45
A	-8	HIS	-	expression tag	UNP Q9GV45
A	-7	HIS	-	expression tag	UNP Q9GV45
A	-6	HIS	-	expression tag	UNP Q9GV45
A	-5	HIS	-	expression tag	UNP Q9GV45
A	-4	SER	-	expression tag	UNP Q9GV45
A	-3	ASP	-	expression tag	UNP Q9GV45
A	-2	ASN	-	expression tag	UNP Q9GV45
A	-1	MET	-	expression tag	UNP Q9GV45
A	0	VAL	-	expression tag	UNP Q9GV45
A	4	GLU	ALA	engineered mutation	UNP Q9GV45

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
A	11	ARG	GLN	engineered mutation	UNP Q9GV45
A	18	LEU	GLN	engineered mutation	UNP Q9GV45
A	27	VAL	LEU	engineered mutation	UNP Q9GV45
A	33	ASN	ALA	engineered mutation	UNP Q9GV45
A	43	ARG	LYS	engineered mutation	UNP Q9GV45
A	44	ILE	VAL	engineered mutation	UNP Q9GV45
A	54	ILE	ALA	engineered mutation	UNP Q9GV45
A	68	ASP	PHE	engineered mutation	UNP Q9GV45
A	72	GLN	LEU	engineered mutation	UNP Q9GV45
A	75	LYS	MET	engineered mutation	UNP Q9GV45
A	90	VAL	ILE	engineered mutation	UNP Q9GV45
A	115	GLU	PRO	engineered mutation	UNP Q9GV45
A	124	LYS	GLN	engineered mutation	UNP Q9GV45
A	138	ILE	TYR	engineered mutation	UNP Q9GV45
A	166	ARG	ASN	engineered mutation	UNP Q9GV45
B	-11	MET	-	initiating methionine	UNP Q9GV45
B	-10	HIS	-	expression tag	UNP Q9GV45
B	-9	HIS	-	expression tag	UNP Q9GV45
B	-8	HIS	-	expression tag	UNP Q9GV45
B	-7	HIS	-	expression tag	UNP Q9GV45
B	-6	HIS	-	expression tag	UNP Q9GV45
B	-5	HIS	-	expression tag	UNP Q9GV45
B	-4	SER	-	expression tag	UNP Q9GV45
B	-3	ASP	-	expression tag	UNP Q9GV45
B	-2	ASN	-	expression tag	UNP Q9GV45
B	-1	MET	-	expression tag	UNP Q9GV45
B	0	VAL	-	expression tag	UNP Q9GV45
B	4	GLU	ALA	engineered mutation	UNP Q9GV45
B	11	ARG	GLN	engineered mutation	UNP Q9GV45
B	18	LEU	GLN	engineered mutation	UNP Q9GV45
B	27	VAL	LEU	engineered mutation	UNP Q9GV45
B	33	ASN	ALA	engineered mutation	UNP Q9GV45
B	43	ARG	LYS	engineered mutation	UNP Q9GV45
B	44	ILE	VAL	engineered mutation	UNP Q9GV45
B	54	ILE	ALA	engineered mutation	UNP Q9GV45
B	68	ASP	PHE	engineered mutation	UNP Q9GV45
B	72	GLN	LEU	engineered mutation	UNP Q9GV45
B	75	LYS	MET	engineered mutation	UNP Q9GV45
B	90	VAL	ILE	engineered mutation	UNP Q9GV45
B	115	GLU	PRO	engineered mutation	UNP Q9GV45
B	124	LYS	GLN	engineered mutation	UNP Q9GV45
B	138	ILE	TYR	engineered mutation	UNP Q9GV45

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
B	166	ARG	ASN	engineered mutation	UNP Q9GV45
C	-11	MET	-	initiating methionine	UNP Q9GV45
C	-10	HIS	-	expression tag	UNP Q9GV45
C	-9	HIS	-	expression tag	UNP Q9GV45
C	-8	HIS	-	expression tag	UNP Q9GV45
C	-7	HIS	-	expression tag	UNP Q9GV45
C	-6	HIS	-	expression tag	UNP Q9GV45
C	-5	HIS	-	expression tag	UNP Q9GV45
C	-4	SER	-	expression tag	UNP Q9GV45
C	-3	ASP	-	expression tag	UNP Q9GV45
C	-2	ASN	-	expression tag	UNP Q9GV45
C	-1	MET	-	expression tag	UNP Q9GV45
C	0	VAL	-	expression tag	UNP Q9GV45
C	4	GLU	ALA	engineered mutation	UNP Q9GV45
C	11	ARG	GLN	engineered mutation	UNP Q9GV45
C	18	LEU	GLN	engineered mutation	UNP Q9GV45
C	27	VAL	LEU	engineered mutation	UNP Q9GV45
C	33	ASN	ALA	engineered mutation	UNP Q9GV45
C	43	ARG	LYS	engineered mutation	UNP Q9GV45
C	44	ILE	VAL	engineered mutation	UNP Q9GV45
C	54	ILE	ALA	engineered mutation	UNP Q9GV45
C	68	ASP	PHE	engineered mutation	UNP Q9GV45
C	72	GLN	LEU	engineered mutation	UNP Q9GV45
C	75	LYS	MET	engineered mutation	UNP Q9GV45
C	90	VAL	ILE	engineered mutation	UNP Q9GV45
C	115	GLU	PRO	engineered mutation	UNP Q9GV45
C	124	LYS	GLN	engineered mutation	UNP Q9GV45
C	138	ILE	TYR	engineered mutation	UNP Q9GV45
C	166	ARG	ASN	engineered mutation	UNP Q9GV45
D	-11	MET	-	initiating methionine	UNP Q9GV45
D	-10	HIS	-	expression tag	UNP Q9GV45
D	-9	HIS	-	expression tag	UNP Q9GV45
D	-8	HIS	-	expression tag	UNP Q9GV45
D	-7	HIS	-	expression tag	UNP Q9GV45
D	-6	HIS	-	expression tag	UNP Q9GV45
D	-5	HIS	-	expression tag	UNP Q9GV45
D	-4	SER	-	expression tag	UNP Q9GV45
D	-3	ASP	-	expression tag	UNP Q9GV45
D	-2	ASN	-	expression tag	UNP Q9GV45
D	-1	MET	-	expression tag	UNP Q9GV45
D	0	VAL	-	expression tag	UNP Q9GV45
D	4	GLU	ALA	engineered mutation	UNP Q9GV45

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
D	11	ARG	GLN	engineered mutation	UNP Q9GV45
D	18	LEU	GLN	engineered mutation	UNP Q9GV45
D	27	VAL	LEU	engineered mutation	UNP Q9GV45
D	33	ASN	ALA	engineered mutation	UNP Q9GV45
D	43	ARG	LYS	engineered mutation	UNP Q9GV45
D	44	ILE	VAL	engineered mutation	UNP Q9GV45
D	54	ILE	ALA	engineered mutation	UNP Q9GV45
D	68	ASP	PHE	engineered mutation	UNP Q9GV45
D	72	GLN	LEU	engineered mutation	UNP Q9GV45
D	75	LYS	MET	engineered mutation	UNP Q9GV45
D	90	VAL	ILE	engineered mutation	UNP Q9GV45
D	115	GLU	PRO	engineered mutation	UNP Q9GV45
D	124	LYS	GLN	engineered mutation	UNP Q9GV45
D	138	ILE	TYR	engineered mutation	UNP Q9GV45
D	166	ARG	ASN	engineered mutation	UNP Q9GV45
E	-11	MET	-	initiating methionine	UNP Q9GV45
E	-10	HIS	-	expression tag	UNP Q9GV45
E	-9	HIS	-	expression tag	UNP Q9GV45
E	-8	HIS	-	expression tag	UNP Q9GV45
E	-7	HIS	-	expression tag	UNP Q9GV45
E	-6	HIS	-	expression tag	UNP Q9GV45
E	-5	HIS	-	expression tag	UNP Q9GV45
E	-4	SER	-	expression tag	UNP Q9GV45
E	-3	ASP	-	expression tag	UNP Q9GV45
E	-2	ASN	-	expression tag	UNP Q9GV45
E	-1	MET	-	expression tag	UNP Q9GV45
E	0	VAL	-	expression tag	UNP Q9GV45
E	4	GLU	ALA	engineered mutation	UNP Q9GV45
E	11	ARG	GLN	engineered mutation	UNP Q9GV45
E	18	LEU	GLN	engineered mutation	UNP Q9GV45
E	27	VAL	LEU	engineered mutation	UNP Q9GV45
E	33	ASN	ALA	engineered mutation	UNP Q9GV45
E	43	ARG	LYS	engineered mutation	UNP Q9GV45
E	44	ILE	VAL	engineered mutation	UNP Q9GV45
E	54	ILE	ALA	engineered mutation	UNP Q9GV45
E	68	ASP	PHE	engineered mutation	UNP Q9GV45
E	72	GLN	LEU	engineered mutation	UNP Q9GV45
E	75	LYS	MET	engineered mutation	UNP Q9GV45
E	90	VAL	ILE	engineered mutation	UNP Q9GV45
E	115	GLU	PRO	engineered mutation	UNP Q9GV45
E	124	LYS	GLN	engineered mutation	UNP Q9GV45
E	138	ILE	TYR	engineered mutation	UNP Q9GV45

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
E	166	ARG	ASN	engineered mutation	UNP Q9GV45
F	-11	MET	-	initiating methionine	UNP Q9GV45
F	-10	HIS	-	expression tag	UNP Q9GV45
F	-9	HIS	-	expression tag	UNP Q9GV45
F	-8	HIS	-	expression tag	UNP Q9GV45
F	-7	HIS	-	expression tag	UNP Q9GV45
F	-6	HIS	-	expression tag	UNP Q9GV45
F	-5	HIS	-	expression tag	UNP Q9GV45
F	-4	SER	-	expression tag	UNP Q9GV45
F	-3	ASP	-	expression tag	UNP Q9GV45
F	-2	ASN	-	expression tag	UNP Q9GV45
F	-1	MET	-	expression tag	UNP Q9GV45
F	0	VAL	-	expression tag	UNP Q9GV45
F	4	GLU	ALA	engineered mutation	UNP Q9GV45
F	11	ARG	GLN	engineered mutation	UNP Q9GV45
F	18	LEU	GLN	engineered mutation	UNP Q9GV45
F	27	VAL	LEU	engineered mutation	UNP Q9GV45
F	33	ASN	ALA	engineered mutation	UNP Q9GV45
F	43	ARG	LYS	engineered mutation	UNP Q9GV45
F	44	ILE	VAL	engineered mutation	UNP Q9GV45
F	54	ILE	ALA	engineered mutation	UNP Q9GV45
F	68	ASP	PHE	engineered mutation	UNP Q9GV45
F	72	GLN	LEU	engineered mutation	UNP Q9GV45
F	75	LYS	MET	engineered mutation	UNP Q9GV45
F	90	VAL	ILE	engineered mutation	UNP Q9GV45
F	115	GLU	PRO	engineered mutation	UNP Q9GV45
F	124	LYS	GLN	engineered mutation	UNP Q9GV45
F	138	ILE	TYR	engineered mutation	UNP Q9GV45
F	166	ARG	ASN	engineered mutation	UNP Q9GV45
G	-11	MET	-	initiating methionine	UNP Q9GV45
G	-10	HIS	-	expression tag	UNP Q9GV45
G	-9	HIS	-	expression tag	UNP Q9GV45
G	-8	HIS	-	expression tag	UNP Q9GV45
G	-7	HIS	-	expression tag	UNP Q9GV45
G	-6	HIS	-	expression tag	UNP Q9GV45
G	-5	HIS	-	expression tag	UNP Q9GV45
G	-4	SER	-	expression tag	UNP Q9GV45
G	-3	ASP	-	expression tag	UNP Q9GV45
G	-2	ASN	-	expression tag	UNP Q9GV45
G	-1	MET	-	expression tag	UNP Q9GV45
G	0	VAL	-	expression tag	UNP Q9GV45
G	4	GLU	ALA	engineered mutation	UNP Q9GV45

Continued on next page...

Continued from previous page...

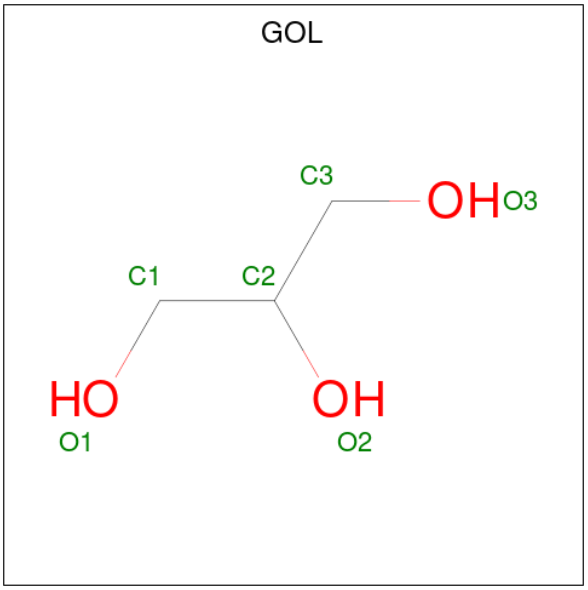
Chain	Residue	Modelled	Actual	Comment	Reference
G	11	ARG	GLN	engineered mutation	UNP Q9GV45
G	18	LEU	GLN	engineered mutation	UNP Q9GV45
G	27	VAL	LEU	engineered mutation	UNP Q9GV45
G	33	ASN	ALA	engineered mutation	UNP Q9GV45
G	43	ARG	LYS	engineered mutation	UNP Q9GV45
G	44	ILE	VAL	engineered mutation	UNP Q9GV45
G	54	ILE	ALA	engineered mutation	UNP Q9GV45
G	68	ASP	PHE	engineered mutation	UNP Q9GV45
G	72	GLN	LEU	engineered mutation	UNP Q9GV45
G	75	LYS	MET	engineered mutation	UNP Q9GV45
G	90	VAL	ILE	engineered mutation	UNP Q9GV45
G	115	GLU	PRO	engineered mutation	UNP Q9GV45
G	124	LYS	GLN	engineered mutation	UNP Q9GV45
G	138	ILE	TYR	engineered mutation	UNP Q9GV45
G	166	ARG	ASN	engineered mutation	UNP Q9GV45
H	-11	MET	-	initiating methionine	UNP Q9GV45
H	-10	HIS	-	expression tag	UNP Q9GV45
H	-9	HIS	-	expression tag	UNP Q9GV45
H	-8	HIS	-	expression tag	UNP Q9GV45
H	-7	HIS	-	expression tag	UNP Q9GV45
H	-6	HIS	-	expression tag	UNP Q9GV45
H	-5	HIS	-	expression tag	UNP Q9GV45
H	-4	SER	-	expression tag	UNP Q9GV45
H	-3	ASP	-	expression tag	UNP Q9GV45
H	-2	ASN	-	expression tag	UNP Q9GV45
H	-1	MET	-	expression tag	UNP Q9GV45
H	0	VAL	-	expression tag	UNP Q9GV45
H	4	GLU	ALA	engineered mutation	UNP Q9GV45
H	11	ARG	GLN	engineered mutation	UNP Q9GV45
H	18	LEU	GLN	engineered mutation	UNP Q9GV45
H	27	VAL	LEU	engineered mutation	UNP Q9GV45
H	33	ASN	ALA	engineered mutation	UNP Q9GV45
H	43	ARG	LYS	engineered mutation	UNP Q9GV45
H	44	ILE	VAL	engineered mutation	UNP Q9GV45
H	54	ILE	ALA	engineered mutation	UNP Q9GV45
H	68	ASP	PHE	engineered mutation	UNP Q9GV45
H	72	GLN	LEU	engineered mutation	UNP Q9GV45
H	75	LYS	MET	engineered mutation	UNP Q9GV45
H	90	VAL	ILE	engineered mutation	UNP Q9GV45
H	115	GLU	PRO	engineered mutation	UNP Q9GV45
H	124	LYS	GLN	engineered mutation	UNP Q9GV45
H	138	ILE	TYR	engineered mutation	UNP Q9GV45

Continued on next page...

Continued from previous page...

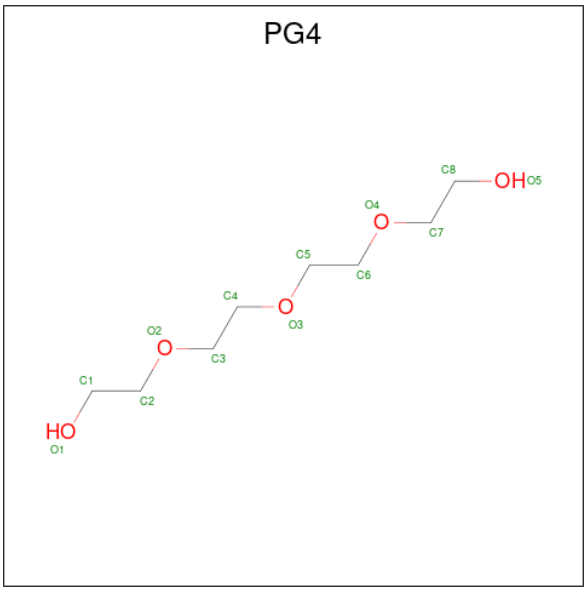
Chain	Residue	Modelled	Actual	Comment	Reference
H	166	ARG	ASN	engineered mutation	UNP Q9GV45

- Molecule 2 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$) (labeled as "Ligand of Interest" by depositor).



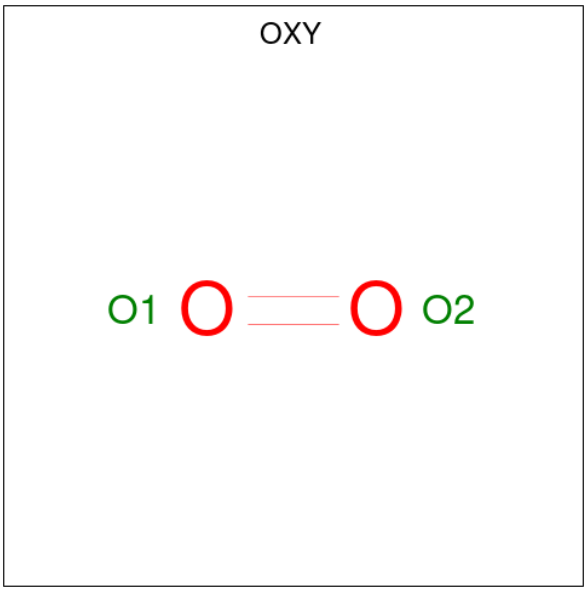
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total C O 6 3 3	0	0
2	H	1	Total C O 6 3 3	0	0

- Molecule 3 is TETRAETHYLENE GLYCOL (three-letter code: PG4) (formula: $C_8H_{18}O_5$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C O 13 8 5	0	0
3	A	1	Total C O 13 8 5	0	0
3	A	1	Total C O 13 8 5	0	0
3	B	1	Total C O 13 8 5	0	0
3	C	1	Total C O 13 8 5	0	0
3	E	1	Total C O 13 8 5	0	0
3	E	1	Total C O 13 8 5	0	0

- Molecule 4 is OXYGEN MOLECULE (three-letter code: OXY) (formula: O_2) (labeled as "Ligand of Interest" by depositor).

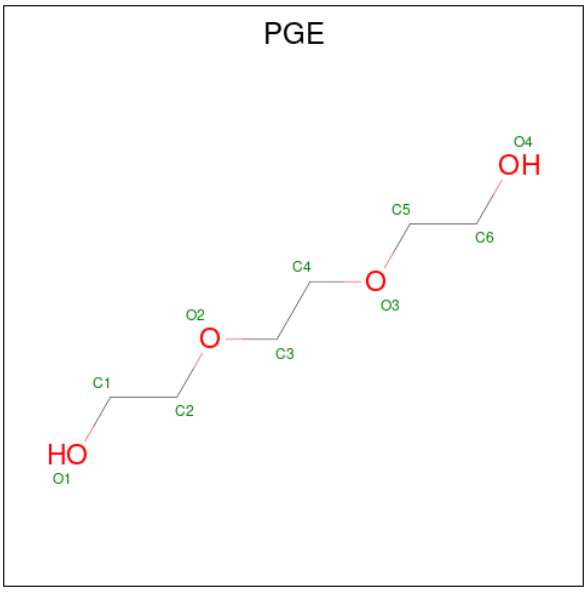


Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total O 2 2	0	0

- Molecule 5 is CHLORIDE ION (three-letter code: CL) (formula: Cl) (labeled as "Ligand of Interest" by depositor).

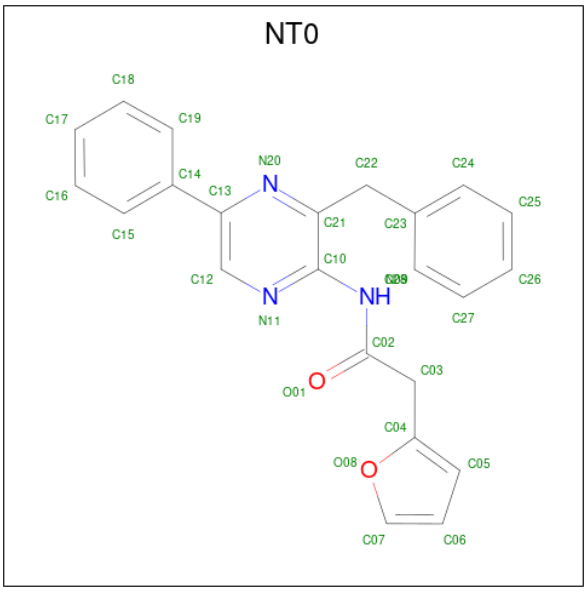
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	3	Total Cl 3 3	0	0
5	B	3	Total Cl 3 3	0	0
5	C	2	Total Cl 2 2	0	0
5	D	2	Total Cl 2 2	0	0
5	E	4	Total Cl 4 4	0	0
5	F	2	Total Cl 2 2	0	0
5	G	4	Total Cl 4 4	0	0
5	H	2	Total Cl 2 2	0	0

- Molecule 6 is TRIETHYLENE GLYCOL (three-letter code: PGE) (formula: $C_6H_{14}O_4$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	D	1	Total C O 10 6 4	0	0

- Molecule 7 is N-(3-Benzyl-5-phenylpyrazin-2-yl)-2-(furan-2-yl)acetamide (three-letter code: NT0) (formula: $C_{23}H_{19}N_3O_2$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	G	1	Total C N O 28 23 3 2	0	0

- Molecule 8 is water.

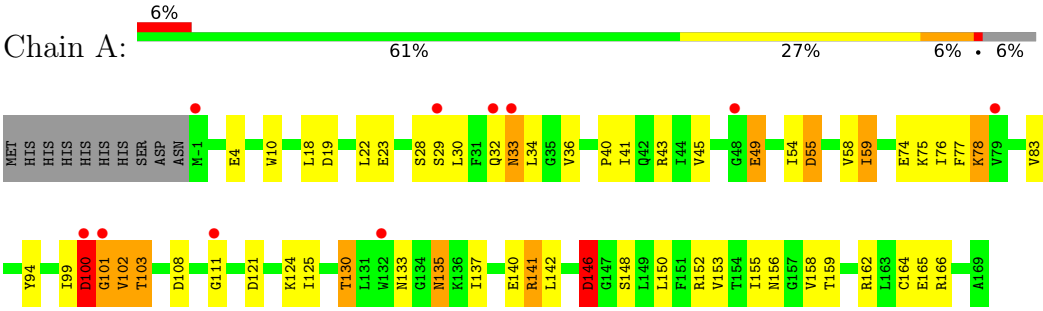
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	A	79	Total O 79 79	0	0
8	B	93	Total O 93 93	0	0
8	C	96	Total O 96 96	0	0
8	D	86	Total O 86 86	0	0
8	E	101	Total O 101 101	0	0
8	F	101	Total O 101 101	0	0
8	G	110	Total O 111 111	0	1
8	H	104	Total O 104 104	0	0

3 Residue-property plots (i)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density (RSRZ > 2). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

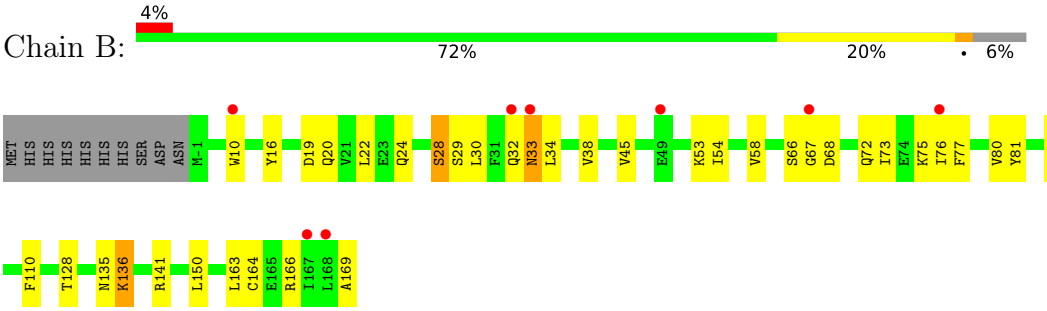
• Molecule 1: NanoLuc luciferase

Chain A:



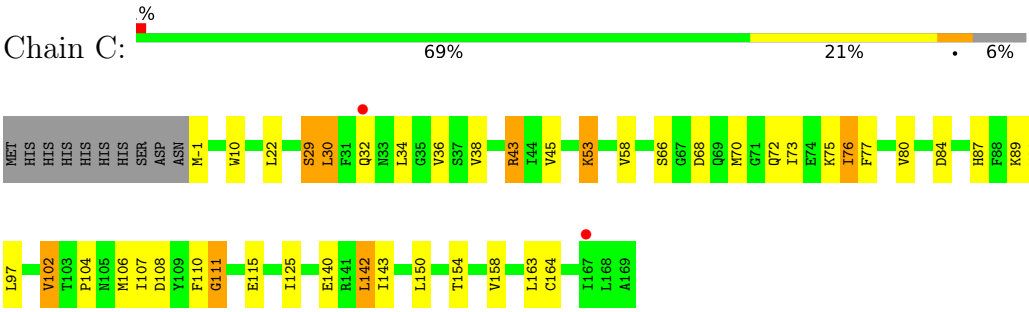
• Molecule 1: NanoLuc luciferase

Chain B:



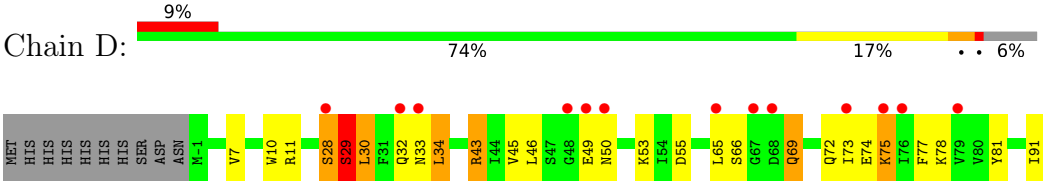
• Molecule 1: NanoLuc luciferase

Chain C:



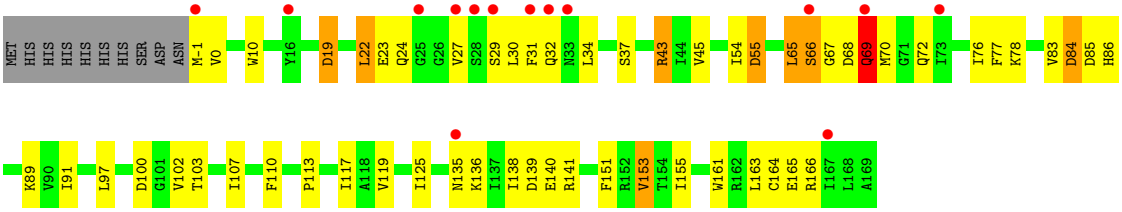
• Molecule 1: NanoLuc luciferase

Chain D:



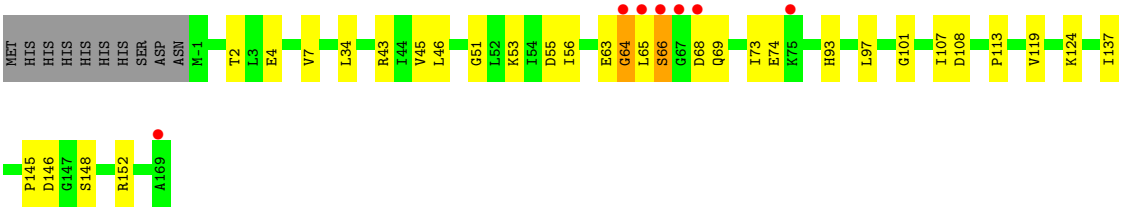
• Molecule 1: NanoLuc luciferase

Chain E:



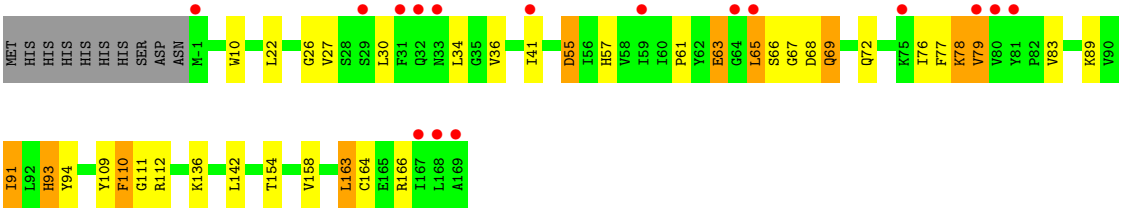
• Molecule 1: NanoLuc luciferase

Chain F:



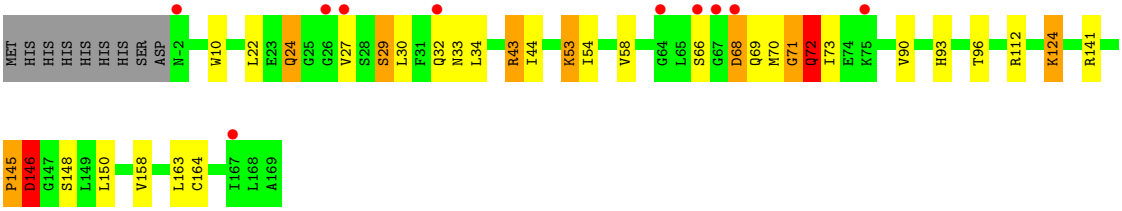
• Molecule 1: NanoLuc luciferase

Chain G:



• Molecule 1: NanoLuc luciferase

Chain H:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	86.91Å 87.49Å 191.76Å 90.00° 90.09° 90.00°	Depositor
Resolution (Å)	47.94 – 1.69 47.94 – 1.69	Depositor EDS
% Data completeness (in resolution range)	97.7 (47.94-1.69) 98.5 (47.94-1.69)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.31 (at 1.69Å)	Xtriage
Refinement program	REFMAC 5.8.0238	Depositor
R, R_{free}	0.135 , 0.183 0.166 , 0.219	Depositor DCC
R_{free} test set	8057 reflections (5.08%)	wwPDB-VP
Wilson B-factor (Å^2)	25.0	Xtriage
Anisotropy	0.130	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.36 , 48.7	EDS
L-test for twinning[2]	$< \|L\| > = 0.48$, $< L^2 > = 0.32$	Xtriage
Estimated twinning fraction	0.034 for k,h,-l 0.024 for -k,-h,-l 0.057 for -h,-k,l	Xtriage
Reported twinning fraction	0.606 for H, K, L 0.214 for h,-k,-l 0.089 for K, H, -L 0.090 for -K, -H, -L	Depositor
Outliers	0 of 158493 reflections	Xtriage
F_o,F_c correlation	0.96	EDS
Total number of atoms	11762	wwPDB-VP
Average B, all atoms (Å^2)	33.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 45.48 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 1.3129e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: PG4, OXY, NT0, PGE, GOL, CL

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#$\|Z\|$ >5	RMSZ	#$\|Z\|$ >5
1	A	1.24	4/1384 (0.3%)	1.14	7/1878 (0.4%)
1	B	0.96	1/1378 (0.1%)	1.12	2/1870 (0.1%)
1	C	0.99	2/1378 (0.1%)	1.11	2/1870 (0.1%)
1	D	0.93	0/1384	1.15	3/1878 (0.2%)
1	E	0.92	1/1378 (0.1%)	1.10	4/1870 (0.2%)
1	F	0.99	2/1389 (0.1%)	1.18	1/1884 (0.1%)
1	G	0.90	0/1384	1.12	3/1878 (0.2%)
1	H	0.96	2/1386 (0.1%)	1.13	5/1881 (0.3%)
All	All	0.99	12/11061 (0.1%)	1.13	27/15009 (0.2%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand.A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	1	0
1	C	0	1
1	D	0	1
1	E	0	1
1	F	0	4
1	G	0	1
All	All	1	8

All (12) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	74	GLU	CD-OE1	23.89	1.51	1.25
1	A	74	GLU	CD-OE2	18.78	1.46	1.25
1	A	165	GLU	CD-OE1	-6.78	1.18	1.25
1	B	66	SER	CB-OG	6.01	1.50	1.42

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	F	51	GLY	C-O	5.97	1.33	1.23
1	E	165	GLU	CD-OE1	-5.87	1.19	1.25
1	C	111	GLY	C-O	5.79	1.32	1.23
1	H	72	GLN	CD-NE2	5.63	1.47	1.32
1	F	137	ILE	C-O	5.53	1.33	1.23
1	C	90	VAL	C-O	5.35	1.33	1.23
1	H	72	GLN	CD-OE1	5.28	1.35	1.24
1	A	49	GLU	CD-OE2	5.24	1.31	1.25

All (27) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	E	43	ARG	CG-CD-NE	8.20	129.01	111.80
1	H	43	ARG	NE-CZ-NH1	7.50	124.05	120.30
1	E	166	ARG	NE-CZ-NH1	-7.47	116.56	120.30
1	D	93	HIS	CB-CA-C	-7.47	95.46	110.40
1	A	166	ARG	NE-CZ-NH1	-7.45	116.57	120.30
1	G	93	HIS	CB-CA-C	-7.29	95.82	110.40
1	A	166	ARG	NE-CZ-NH2	7.12	123.86	120.30
1	H	68	ASP	CB-CA-C	6.69	123.78	110.40
1	A	100	ASP	CB-CA-C	6.46	123.31	110.40
1	A	141	ARG	NE-CZ-NH1	6.36	123.48	120.30
1	B	166	ARG	NE-CZ-NH2	6.21	123.41	120.30
1	A	146	ASP	CB-CA-C	-5.93	98.54	110.40
1	G	166	ARG	NE-CZ-NH1	-5.64	117.48	120.30
1	D	11	ARG	NE-CZ-NH1	5.55	123.07	120.30
1	E	84	ASP	CB-CA-C	-5.46	99.48	110.40
1	C	70	MET	CG-SD-CE	-5.43	91.51	100.20
1	H	112	ARG	NE-CZ-NH1	-5.43	117.58	120.30
1	H	93	HIS	CB-CA-C	-5.42	99.55	110.40
1	E	83	VAL	C-N-CA	5.35	135.09	121.70
1	G	110	PHE	CB-CA-C	5.35	121.10	110.40
1	H	145	PRO	C-N-CA	5.35	135.06	121.70
1	B	93	HIS	CB-CA-C	-5.32	99.76	110.40
1	A	43	ARG	NE-CZ-NH2	-5.17	117.72	120.30
1	D	43	ARG	NE-CZ-NH2	-5.11	117.74	120.30
1	C	43	ARG	NE-CZ-NH1	5.07	122.84	120.30
1	F	66	SER	C-N-CA	5.03	132.87	122.30
1	A	100	ASP	N-CA-CB	5.00	119.60	110.60

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
1	A	100	ASP	CA

All (8) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	C	68	ASP	Peptide
1	D	66	SER	Peptide
1	E	69	GLN	Peptide
1	F	63	GLU	Peptide
1	F	66	SER	Peptide
1	F	68	ASP	Peptide
1	F	69	GLN	Peptide
1	G	63	GLU	Peptide

5.2 Too-close contacts (i)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1355	0	1357	52	0
1	B	1349	0	1353	33	0
1	C	1349	0	1353	38	0
1	D	1355	0	1357	34	0
1	E	1349	0	1353	51	0
1	F	1357	0	1366	20	0
1	G	1355	0	1357	50	0
1	H	1357	0	1359	24	0
2	A	6	0	8	3	0
2	H	6	0	8	4	0
3	A	39	0	54	8	0
3	B	13	0	18	2	0
3	C	13	0	18	5	0
3	E	26	0	36	14	0
4	A	2	0	0	2	0
5	A	3	0	0	0	0
5	B	3	0	0	0	0
5	C	2	0	0	0	0
5	D	2	0	0	0	0
5	E	4	0	0	3	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	F	2	0	0	0	0
5	G	4	0	0	0	0
5	H	2	0	0	1	0
6	D	10	0	14	2	0
7	G	28	0	0	15	0
8	A	79	0	0	9	0
8	B	93	0	0	2	0
8	C	96	0	0	0	0
8	D	86	0	0	4	0
8	E	101	0	0	4	0
8	F	101	0	0	5	0
8	G	111	0	0	1	0
8	H	104	0	0	8	0
All	All	11762	0	11011	298	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 14.

All (298) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:34:LEU:HD11	1:F:73:ILE:HD11	1.27	1.12
1:G:91:ILE:HD11	7:G:301:NT0:C05	1.88	1.03
7:G:301:NT0:C15	5:H:202:CL:CL	2.46	1.01
1:G:41:ILE:HD13	7:G:301:NT0:C18	1.95	0.96
1:D:74:GLU:HB3	1:D:78:LYS:O	1.67	0.94
1:E:89:LYS:HZ3	3:E:201:PG4:H22	1.34	0.90
1:A:164[B]:CYS:SG	8:A:328:HOH:O	2.34	0.86
1:E:30:LEU:HD21	1:E:77:PHE:HE2	1.41	0.85
2:H:201:GOL:H11	8:H:343:HOH:O	1.77	0.83
1:H:72:GLN:HA	1:H:72:GLN:OE1	1.79	0.82
1:A:78:LYS:HA	8:A:310:HOH:O	1.81	0.80
1:A:59:ILE:N	1:A:59:ILE:HD12	1.98	0.79
1:A:59:ILE:N	1:A:59:ILE:CD1	2.46	0.79
1:E:19:ASP:OD2	1:E:32:GLN:HB2	1.83	0.78
1:G:30:LEU:CD1	1:G:77:PHE:CE2	2.65	0.78
1:A:89:LYS:HZ1	3:A:204:PG4:H62	1.48	0.78
1:E:163:LEU:HD11	1:G:63:GLU:O	1.84	0.77
1:A:100:ASP:O	1:A:102:VAL:HG13	1.85	0.76
1:C:89:LYS:HZ3	3:C:201:PG4:H41	1.51	0.76
1:G:65:LEU:HD22	1:G:65:LEU:H	1.50	0.74

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:34:LEU:CD1	1:F:73:ILE:HD11	2.15	0.74
1:A:101:GLY:O	1:A:103:THR:HG23	1.88	0.73
1:H:24:GLN:HA	1:H:24:GLN:NE2	2.03	0.72
1:E:24:GLN:O	1:E:135:ASN:ND2	2.24	0.71
1:H:43:ARG:NH2	8:H:301:HOH:O	2.23	0.71
1:E:65:LEU:O	1:E:67:GLY:N	2.24	0.70
1:G:30:LEU:HD11	1:G:77:PHE:CE2	2.26	0.70
1:G:65:LEU:HD22	1:G:65:LEU:N	2.06	0.70
1:A:78:LYS:CB	8:A:304:HOH:O	2.39	0.70
1:E:45:VAL:HG12	1:F:43[A]:ARG:NH1	2.07	0.69
1:C:29:SER:HB3	1:C:32:GLN:CG	2.22	0.69
1:H:53:LYS:NZ	8:H:301:HOH:O	2.26	0.69
1:C:29:SER:HB3	1:C:32:GLN:HG2	1.74	0.69
1:G:89:LYS:NZ	7:G:301:NT0:N09	2.42	0.68
1:F:152:ARG:HD2	8:F:308:HOH:O	1.94	0.67
1:H:22:LEU:HD22	1:H:27:VAL:HG11	1.77	0.67
1:E:91:ILE:HD11	3:E:201:PG4:H81	1.76	0.67
1:A:135:ASN:OD1	1:A:156:ASN:ND2	2.25	0.67
1:E:66:SER:OG	1:E:69:GLN:HB3	1.95	0.67
1:A:78:LYS:HB2	8:A:304:HOH:O	1.94	0.66
1:B:29:SER:OG	1:B:32:GLN:HB2	1.96	0.66
1:B:45:VAL:HG22	1:B:53:LYS:HB3	1.78	0.66
1:E:151:PHE:CE1	1:E:153:VAL:HG22	2.31	0.66
1:B:28:SER:HB3	1:B:33:ASN:OD1	1.95	0.66
1:H:150:LEU:HD13	1:H:163:LEU:HD22	1.78	0.65
1:B:45:VAL:CG2	1:B:53:LYS:HB3	2.26	0.65
1:G:89:LYS:HE2	7:G:301:NT0:C25	2.27	0.65
1:H:150:LEU:CD1	1:H:163:LEU:CD2	2.75	0.65
1:B:34:LEU:HD21	1:B:72:GLN:CB	2.27	0.64
1:H:24:GLN:HG2	1:H:158:VAL:HG21	1.79	0.64
1:A:89:LYS:NZ	3:A:204:PG4:H62	2.12	0.64
1:C:97:LEU:CD2	1:C:107:ILE:HD11	2.27	0.64
1:D:72:GLN:O	1:D:75:LYS:N	2.29	0.64
1:F:148:SER:HB3	8:F:301:HOH:O	1.98	0.64
1:C:29:SER:CB	1:C:32:GLN:HG2	2.27	0.64
1:E:161:TRP:CZ3	1:G:65:LEU:HD21	2.33	0.64
5:E:205:CL:CL	1:F:45:VAL:HG13	2.34	0.64
3:E:202:PG4:H82	1:F:146:ASP:O	1.97	0.63
1:E:30:LEU:HD21	1:E:77:PHE:CE2	2.27	0.63
1:D:30:LEU:HD13	1:D:77:PHE:CE1	2.33	0.63
1:E:163:LEU:HD21	1:G:63:GLU:OE1	1.98	0.63

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:16:TYR:OH	1:B:163:LEU:HD12	1.99	0.63
1:C:10:TRP:HB3	1:C:164:CYS:HB3	1.81	0.62
1:B:67:GLY:HA3	1:B:68:ASP:HB2	1.81	0.62
1:E:91:ILE:HD11	3:E:201:PG4:C8	2.30	0.62
1:H:72:GLN:OE1	1:H:72:GLN:CA	2.48	0.62
1:C:95:GLY:HA3	1:C:107:ILE:HD13	1.81	0.62
1:E:22:LEU:HD12	1:E:27:VAL:HG23	1.82	0.61
1:B:28:SER:O	1:B:76:ILE:HD13	2.00	0.61
1:D:157:GLY:N	8:D:302:HOH:O	2.28	0.61
1:G:34:LEU:HD21	1:G:69:GLN:HG2	1.83	0.61
3:E:202:PG4:H52	1:F:145:PRO:O	2.01	0.61
1:D:91:ILE:HG21	1:D:94:TYR:HB2	1.82	0.60
1:G:55:ASP:OD1	1:G:57:HIS:HD2	1.84	0.60
1:D:74:GLU:CB	1:D:78:LYS:O	2.45	0.60
1:A:162:ARG:HH12	2:A:201:GOL:H11	1.66	0.59
1:H:150:LEU:CD1	1:H:163:LEU:HD22	2.32	0.59
1:G:89:LYS:HZ2	7:G:301:NT0:C04	2.15	0.59
1:H:29:SER:O	1:H:33:ASN:HB2	2.01	0.59
1:B:67:GLY:CA	1:B:68:ASP:HB2	2.32	0.59
1:B:19:ASP:HB3	1:B:32:GLN:HE21	1.67	0.59
1:D:77:PHE:CE2	1:D:92:LEU:CD2	2.86	0.59
1:G:83:VAL:HG22	7:G:301:NT0:C25	2.32	0.59
1:A:89:LYS:CE	3:A:204:PG4:H41	2.32	0.59
1:E:89:LYS:NZ	3:E:201:PG4:H42	2.17	0.59
1:F:56:ILE:HG23	8:F:348:HOH:O	2.01	0.58
1:B:53:LYS:NZ	1:B:94:TYR:OH	2.33	0.58
1:D:77:PHE:CE2	1:D:92:LEU:HD22	2.38	0.58
1:F:34:LEU:HD11	1:F:73:ILE:CD1	2.18	0.58
1:B:128:THR:HG23	8:B:558:HOH:O	2.03	0.58
1:E:45:VAL:HG12	1:F:43[B]:ARG:HH11	1.69	0.57
1:C:30:LEU:HD23	1:C:34:LEU:HD12	1.87	0.57
1:D:32:GLN:OE1	1:D:32:GLN:HA	2.05	0.56
1:D:77:PHE:HE2	1:D:92:LEU:HD22	1.71	0.56
1:D:128:THR:HG23	8:D:342:HOH:O	2.05	0.56
1:E:161:TRP:CE3	1:G:65:LEU:HD21	2.40	0.56
1:E:54:ILE:HG21	1:E:141:ARG:NH2	2.21	0.56
1:C:97:LEU:HD23	1:C:107:ILE:HD11	1.87	0.56
1:E:10:TRP:HB3	1:E:164:CYS:HB3	1.87	0.55
1:B:24:GLN:O	1:B:135:ASN:OD1	2.23	0.55
1:E:107:ILE:O	1:E:113:PRO:HA	2.06	0.55
1:G:30:LEU:CD1	1:G:77:PHE:CZ	2.89	0.55

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:40:PRO:HD3	2:A:201:GOL:H32	1.89	0.55
1:G:30:LEU:CD1	1:G:77:PHE:HE2	2.18	0.55
1:E:85:ASP:HB2	3:E:202:PG4:H72	1.87	0.55
1:A:18:LEU:O	1:A:22:LEU:HG	2.07	0.55
1:D:164[B]:CYS:SG	8:D:344:HOH:O	2.41	0.55
1:G:78:LYS:CD	1:G:111:GLY:O	2.55	0.55
1:C:29:SER:OG	1:C:32:GLN:HG2	2.07	0.54
1:B:68:ASP:O	1:B:72:GLN:HG3	2.07	0.54
1:B:150:LEU:HD13	1:B:163:LEU:HD21	1.89	0.54
1:C:45:VAL:HG12	1:D:43:ARG:NE	2.21	0.54
1:B:77:PHE:CE2	1:B:90:VAL:HG11	2.43	0.54
1:H:30:LEU:HA	1:H:34:LEU:HD13	1.90	0.54
1:E:84:ASP:OD1	3:E:202:PG4:H81	2.08	0.54
1:E:89:LYS:HZ3	3:E:201:PG4:H42	1.72	0.54
1:B:28:SER:HB2	1:B:76:ILE:HG12	1.90	0.54
1:F:56:ILE:CG2	8:F:348:HOH:O	2.55	0.53
1:G:93:HIS:CE1	1:G:109:TYR:HE1	2.26	0.53
1:E:151:PHE:HE1	1:E:153:VAL:HG22	1.74	0.53
1:G:142:LEU:C	1:G:142:LEU:HD12	2.29	0.53
1:A:125:ILE:O	1:A:140:GLU:HA	2.09	0.52
1:B:34:LEU:HD21	1:B:72:GLN:HB2	1.91	0.52
1:D:28:SER:O	1:D:29:SER:HB3	2.08	0.52
1:A:30:LEU:HG	1:A:77:PHE:CZ	2.45	0.52
1:C:72:GLN:O	1:C:76:ILE:HG23	2.10	0.52
1:G:65:LEU:O	1:G:67:GLY:N	2.34	0.52
3:A:202:PG4:O1	3:A:203:PG4:H12	2.10	0.52
1:B:10:TRP:HB3	1:B:164:CYS:HB3	1.91	0.52
1:C:150:LEU:HD13	1:C:163:LEU:CD2	2.40	0.52
1:F:65:LEU:HD11	8:H:396:HOH:O	2.10	0.51
1:F:101:GLY:HA2	1:F:119:VAL:HG12	1.92	0.51
1:A:30:LEU:HG	1:A:77:PHE:HZ	1.76	0.51
1:C:97:LEU:HD21	1:C:107:ILE:HD11	1.93	0.51
1:B:19:ASP:CB	1:B:32:GLN:HE21	2.23	0.51
1:E:89:LYS:NZ	3:E:201:PG4:H22	2.16	0.51
1:G:91:ILE:CD1	7:G:301:NT0:C05	2.76	0.51
1:G:41:ILE:HD13	7:G:301:NT0:C17	2.40	0.51
1:G:89:LYS:HZ2	7:G:301:NT0:C02	2.24	0.51
1:H:146:ASP:HB3	1:H:148:SER:H	1.75	0.50
1:B:34:LEU:HD21	1:B:72:GLN:HB3	1.92	0.50
1:D:53:LYS:NZ	8:D:304:HOH:O	2.43	0.50
1:A:4:GLU:OE2	3:B:401:PG4:H11	2.11	0.50

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:150:LEU:HD13	1:B:163:LEU:CD2	2.42	0.50
1:D:128:THR:HG22	1:D:138:ILE:HD12	1.94	0.50
1:A:34:LEU:HB3	1:A:36:VAL:HG23	1.93	0.50
1:G:10:TRP:HB3	1:G:164[B]:CYS:HB3	1.93	0.49
1:H:10:TRP:HB3	1:H:164:CYS:HB3	1.94	0.49
1:C:108:ASP:OD1	1:C:111:GLY:HA2	2.11	0.49
1:D:69:GLN:HE21	6:D:201:PGE:C6	2.24	0.49
1:G:30:LEU:HB3	1:G:36:VAL:HG13	1.93	0.49
1:C:43:ARG:NH2	1:D:45:VAL:HG12	2.27	0.49
1:A:152:ARG:NH1	8:A:302:HOH:O	2.38	0.49
1:H:54:ILE:HG21	1:H:141:ARG:NH2	2.27	0.49
1:A:75:LYS:HD3	1:E:102:VAL:HG12	1.95	0.49
1:C:53:LYS:HE2	1:C:94:TYR:OH	2.13	0.49
1:D:91:ILE:CG2	1:D:94:TYR:HB2	2.43	0.49
1:C:76:ILE:HD11	1:C:77:PHE:CE1	2.48	0.49
1:G:93:HIS:CE1	1:G:109:TYR:CE1	3.01	0.49
1:C:45:VAL:HG21	1:D:45:VAL:HG11	1.95	0.49
1:A:55:ASP:HB2	1:A:94:TYR:HD1	1.78	0.48
1:E:85:ASP:HB2	3:E:202:PG4:C7	2.44	0.48
1:F:2:THR:OG1	1:F:4:GLU:HG2	2.12	0.48
1:A:30:LEU:HD21	1:A:77:PHE:CE1	2.48	0.48
1:E:84:ASP:HB3	1:E:86:HIS:H	1.78	0.48
1:E:43:ARG:HD2	5:E:206:CL:CL	2.51	0.48
1:G:30:LEU:HD12	1:G:77:PHE:HE2	1.79	0.48
1:A:58:VAL:C	1:A:59:ILE:HD12	2.33	0.48
1:A:83:VAL:HG22	3:A:204:PG4:H61	1.96	0.48
1:C:30:LEU:HD21	1:C:73:ILE:HG12	1.96	0.48
1:G:89:LYS:HE2	7:G:301:NT0:C24	2.44	0.48
1:C:43:ARG:HH22	1:D:45:VAL:HG12	1.78	0.47
1:G:30:LEU:HD13	1:G:77:PHE:CZ	2.48	0.47
1:G:72:GLN:O	1:G:76:ILE:HG23	2.14	0.47
1:A:45:VAL:HG13	4:A:205:OXY:O1	2.14	0.47
1:H:44:ILE:HG12	1:H:54:ILE:HD12	1.96	0.47
1:A:10:TRP:HB3	1:A:164[A]:CYS:HB3	1.96	0.47
1:A:133:ASN:OD1	1:A:135:ASN:HB2	2.15	0.47
1:B:16:TYR:CE1	1:B:163:LEU:HD12	2.49	0.47
1:G:55:ASP:HB2	1:G:94:TYR:CD2	2.50	0.47
1:H:145:PRO:HD2	8:H:302:HOH:O	2.14	0.47
1:A:59:ILE:N	1:A:59:ILE:HD13	2.28	0.47
1:B:54:ILE:HG21	1:B:141:ARG:NH2	2.29	0.47
1:G:65:LEU:H	1:G:65:LEU:CD2	2.25	0.47

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:78:LYS:HB2	1:A:111:GLY:HA3	1.97	0.47
1:C:89:LYS:HZ1	3:C:201:PG4:H71	1.79	0.47
1:A:55:ASP:HB2	1:A:94:TYR:CD1	2.50	0.47
2:A:201:GOL:H31	8:A:345:HOH:O	2.14	0.47
1:A:130:THR:HG21	8:A:372:HOH:O	2.15	0.46
1:E:29:SER:OG	1:E:32:GLN:N	2.36	0.46
1:H:22:LEU:HD22	1:H:27:VAL:CG1	2.45	0.46
1:G:83:VAL:HG22	7:G:301:NT0:C24	2.46	0.46
1:E:66:SER:OG	1:E:69:GLN:CB	2.62	0.46
1:F:107:ILE:O	1:F:113:PRO:HA	2.16	0.46
1:A:99:ILE:O	1:A:101:GLY:N	2.47	0.46
1:D:163:LEU:C	1:D:163:LEU:HD13	2.36	0.46
1:G:10:TRP:HB3	1:G:164[A]:CYS:HB3	1.97	0.46
1:C:84:ASP:OD1	1:C:87:HIS:HD2	2.00	0.45
1:A:89:LYS:HE3	3:A:204:PG4:H41	1.97	0.45
8:E:328:HOH:O	2:H:201:GOL:C1	2.65	0.45
1:G:76:ILE:HD11	1:G:77:PHE:CE2	2.51	0.45
1:A:89:LYS:HE2	3:A:204:PG4:C6	2.47	0.45
1:E:54:ILE:HD12	1:E:97:LEU:HD11	1.98	0.45
1:H:124:LYS:HG3	8:H:333:HOH:O	2.16	0.45
1:A:19:ASP:HB2	8:A:346:HOH:O	2.16	0.45
1:A:141:ARG:HA	1:A:150:LEU:O	2.16	0.45
1:F:7:VAL:HG21	1:F:46:LEU:HG	1.99	0.45
1:D:34:LEU:HD11	1:D:72:GLN:NE2	2.32	0.45
1:B:136:LYS:HD3	8:B:544:HOH:O	2.16	0.45
1:E:23:GLU:HA	8:E:379:HOH:O	2.17	0.45
1:A:41:ILE:HD11	1:B:169:ALA:HA	1.99	0.44
1:A:41:ILE:HD11	1:B:169:ALA:CB	2.46	0.44
1:C:30:LEU:HD22	1:C:36:VAL:HB	1.99	0.44
1:D:81:TYR:N	1:D:81:TYR:CD1	2.85	0.44
1:G:89:LYS:CE	7:G:301:NT0:C24	2.95	0.44
1:C:104:PRO:HB3	1:C:115:GLU:HG3	1.99	0.44
1:C:102:VAL:O	1:C:104:PRO:HD3	2.17	0.44
1:D:142:LEU:C	1:D:142:LEU:HD12	2.37	0.44
1:D:50:ASN:N	1:D:50:ASN:OD1	2.50	0.44
1:E:139:ASP:C	1:E:139:ASP:OD1	2.56	0.44
1:B:22:LEU:HD21	1:B:110:PHE:CZ	2.53	0.44
1:A:33:ASN:HD22	1:A:76:ILE:HD11	1.82	0.44
1:A:146:ASP:HB3	1:A:148:SER:H	1.82	0.44
1:B:81:TYR:CD2	3:B:401:PG4:H12	2.53	0.44
1:G:30:LEU:HB3	1:G:36:VAL:CG1	2.48	0.44

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:201:GOL:H2	8:H:308:HOH:O	2.18	0.44
1:A:54:ILE:HG21	1:A:141:ARG:NH2	2.33	0.44
1:A:101:GLY:C	1:A:103:THR:H	2.21	0.44
1:C:108:ASP:OD1	1:C:111:GLY:CA	2.66	0.44
1:C:89:LYS:NZ	3:C:201:PG4:H71	2.32	0.43
1:G:26:GLY:O	1:G:112:ARG:NH2	2.51	0.43
1:A:155:ILE:O	1:A:158:VAL:HG22	2.18	0.43
1:D:65:LEU:HD23	1:D:69:GLN:HG2	2.00	0.43
1:G:41:ILE:HD13	7:G:301:NT0:C19	2.45	0.43
1:D:34:LEU:HD11	1:D:72:GLN:HE21	1.83	0.43
1:A:29:SER:HB3	1:A:32:GLN:HG3	2.01	0.43
4:A:205:OXY:O2	1:B:53:LYS:NZ	2.51	0.43
1:B:30:LEU:HD22	1:B:73:ILE:HG12	2.01	0.43
1:C:150:LEU:HD13	1:C:163:LEU:HD23	1.99	0.43
1:C:154:THR:HA	1:C:158:VAL:O	2.19	0.43
8:E:328:HOH:O	2:H:201:GOL:H12	2.18	0.43
1:H:71:GLY:C	1:H:73:ILE:H	2.21	0.43
1:A:89:LYS:CE	3:A:204:PG4:H62	2.49	0.43
1:A:121:ASP:C	1:A:121:ASP:OD1	2.54	0.43
1:F:93:HIS:HA	1:F:108:ASP:O	2.18	0.43
1:G:79:VAL:HG23	1:G:91:ILE:HB	2.00	0.43
1:C:22:LEU:HD21	1:C:110:PHE:CZ	2.54	0.43
1:A:91:ILE:HG21	1:A:94:TYR:HB2	2.00	0.43
1:E:54:ILE:HG22	1:E:55:ASP:N	2.34	0.43
1:C:89:LYS:NZ	3:C:201:PG4:H21	2.34	0.42
1:C:89:LYS:NZ	3:C:201:PG4:H41	2.29	0.42
1:D:69:GLN:HE21	6:D:201:PGE:H6	1.84	0.42
1:G:55:ASP:OD2	7:G:301:NT0:O01	2.37	0.42
1:C:38:VAL:HB	1:C:58:VAL:HG11	2.01	0.42
1:E:19:ASP:OD2	1:E:32:GLN:CB	2.62	0.42
1:C:76:ILE:C	1:C:76:ILE:HD12	2.39	0.42
1:E:119:VAL:HG23	5:E:204:CL:CL	2.57	0.42
3:E:201:PG4:H11	8:F:328:HOH:O	2.19	0.42
1:G:22:LEU:HD22	1:G:27:VAL:CG1	2.49	0.42
1:H:53:LYS:HG3	1:H:96:THR:OG1	2.20	0.42
1:D:72:GLN:C	1:D:74:GLU:N	2.73	0.42
1:G:55:ASP:OD1	1:G:55:ASP:C	2.58	0.42
1:G:163:LEU:HD13	1:G:163:LEU:C	2.40	0.42
1:E:110:PHE:CD1	1:E:110:PHE:N	2.88	0.42
1:E:22:LEU:CD1	1:E:27:VAL:HG23	2.50	0.42
1:F:65:LEU:CD1	8:H:396:HOH:O	2.67	0.42

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:38:VAL:CG2	1:B:58:VAL:HG11	2.50	0.42
1:E:54:ILE:HD13	1:E:141:ARG:CZ	2.51	0.41
1:C:150:LEU:HD13	1:C:163:LEU:HD21	2.03	0.41
1:D:77:PHE:O	1:D:78:LYS:HB3	2.20	0.41
1:E:30:LEU:O	1:E:34:LEU:HB2	2.20	0.41
1:H:58:VAL:HG22	1:H:90:VAL:HB	2.02	0.41
1:E:100:ASP:OD2	1:E:103:THR:OG1	2.36	0.41
1:E:136:LYS:O	1:E:155:ILE:HA	2.20	0.41
1:H:24:GLN:HG2	1:H:158:VAL:CG2	2.49	0.41
1:A:28:SER:HB3	1:A:33:ASN:HD21	1.86	0.41
1:D:29:SER:OG	1:D:32:GLN:HG2	2.19	0.41
1:E:91:ILE:HD11	3:E:201:PG4:H82	2.03	0.41
1:F:64:GLY:O	1:F:65:LEU:CB	2.69	0.41
1:B:19:ASP:HB3	1:B:32:GLN:NE2	2.34	0.41
1:D:7:VAL:HG21	1:D:46:LEU:HG	2.02	0.41
1:G:61:PRO:HD3	8:G:417:HOH:O	2.21	0.41
1:G:68:ASP:O	1:G:69:GLN:HB2	2.20	0.41
1:A:78:LYS:HB3	8:A:304:HOH:O	2.15	0.41
1:D:10:TRP:HB3	1:D:164[A]:CYS:HB3	2.02	0.41
1:E:31:PHE:CE1	1:E:37:SER:HA	2.56	0.41
1:H:70:MET:C	1:H:72:GLN:N	2.74	0.41
3:E:201:PG4:H51	3:E:201:PG4:H71	1.83	0.40
1:A:153:VAL:O	1:A:159:THR:HA	2.21	0.40
1:E:66:SER:O	1:E:69:GLN:HB2	2.20	0.40
1:E:136:LYS:HE3	1:E:138:ILE:HD11	2.03	0.40
1:E:125:ILE:O	1:E:140:GLU:HA	2.22	0.40
1:G:27:VAL:HG21	1:G:110:PHE:HB3	2.04	0.40
1:C:142:LEU:HG	1:C:143:ILE:N	2.37	0.40
1:E:43:ARG:NH2	8:E:311:HOH:O	2.50	0.40
1:C:125:ILE:O	1:C:140:GLU:HA	2.22	0.40
1:E:72:GLN:O	1:E:76:ILE:HG13	2.21	0.40
1:G:154:THR:HA	1:G:158:VAL:O	2.22	0.40

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries

of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	A	170/181 (94%)	159 (94%)	6 (4%)	5 (3%)	4 0
1	B	169/181 (93%)	159 (94%)	10 (6%)	0	100 100
1	C	169/181 (93%)	162 (96%)	7 (4%)	0	100 100
1	D	170/181 (94%)	159 (94%)	9 (5%)	2 (1%)	13 3
1	E	169/181 (93%)	159 (94%)	6 (4%)	4 (2%)	6 1
1	F	170/181 (94%)	161 (95%)	8 (5%)	1 (1%)	25 11
1	G	170/181 (94%)	163 (96%)	6 (4%)	1 (1%)	25 11
1	H	170/181 (94%)	156 (92%)	10 (6%)	4 (2%)	6 1
All	All	1357/1448 (94%)	1278 (94%)	62 (5%)	17 (1%)	12 2

All (17) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	100	ASP
1	D	29	SER
1	E	66	SER
1	E	69	GLN
1	G	66	SER
1	H	68	ASP
1	H	71	GLY
1	H	146	ASP
1	A	49	GLU
1	A	101	GLY
1	A	78	LYS
1	E	0	VAL
1	E	70	MET
1	H	72	GLN
1	D	49	GLU
1	F	64	GLY
1	A	102	VAL

5.3.2 Protein sidechains (i)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	A	149/158 (94%)	137 (92%)	12 (8%)	11 2
1	B	148/158 (94%)	142 (96%)	6 (4%)	30 12
1	C	148/158 (94%)	137 (93%)	11 (7%)	13 3
1	D	149/158 (94%)	139 (93%)	10 (7%)	16 4
1	E	148/158 (94%)	138 (93%)	10 (7%)	16 4
1	F	149/158 (94%)	144 (97%)	5 (3%)	37 18
1	G	149/158 (94%)	141 (95%)	8 (5%)	22 7
1	H	149/158 (94%)	140 (94%)	9 (6%)	19 6
All	All	1189/1264 (94%)	1118 (94%)	71 (6%)	19 6

All (71) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	23	GLU
1	A	33	ASN
1	A	55	ASP
1	A	59	ILE
1	A	103	THR
1	A	108	ASP
1	A	124	LYS
1	A	130	THR
1	A	135	ASN
1	A	137	ILE
1	A	142	LEU
1	A	146	ASP
1	B	20	GLN
1	B	28	SER
1	B	33	ASN
1	B	75	LYS
1	B	80	VAL
1	B	136	LYS
1	C	-1	MET
1	C	29	SER
1	C	30	LEU
1	C	53	LYS
1	C	66	SER
1	C	75	LYS

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	C	76	ILE
1	C	80	VAL
1	C	102	VAL
1	C	106	MET
1	C	142	LEU
1	D	28	SER
1	D	29	SER
1	D	30	LEU
1	D	33	ASN
1	D	34	LEU
1	D	55	ASP
1	D	69	GLN
1	D	73	ILE
1	D	75	LYS
1	D	124	LYS
1	E	-1	MET
1	E	19	ASP
1	E	22	LEU
1	E	55	ASP
1	E	65	LEU
1	E	68	ASP
1	E	69	GLN
1	E	78	LYS
1	E	117	ILE
1	E	153	VAL
1	F	53	LYS
1	F	55	ASP
1	F	74	GLU
1	F	97	LEU
1	F	124	LYS
1	G	55	ASP
1	G	65	LEU
1	G	69	GLN
1	G	78	LYS
1	G	79	VAL
1	G	91	ILE
1	G	136	LYS
1	G	163	LEU
1	H	24	GLN
1	H	29	SER
1	H	32	GLN
1	H	53	LYS

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	H	66	SER
1	H	69	GLN
1	H	72	GLN
1	H	124	LYS
1	H	146	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (13) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	32	GLN
1	A	50	ASN
1	A	135	ASN
1	A	156	ASN
1	B	32	GLN
1	C	87	HIS
1	D	72	GLN
1	F	33	ASN
1	F	69	GLN
1	F	135	ASN
1	F	144	ASN
1	G	57	HIS
1	H	144	ASN

5.3.3 RNA

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates

There are no monosaccharides in this entry.

5.6 Ligand geometry

Of 34 ligands modelled in this entry, 22 are monoatomic - leaving 12 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
3	PG4	A	202	-	12,12,12	0.61	0	11,11,11	0.87	0
3	PG4	E	201	-	12,12,12	0.71	0	11,11,11	1.56	2 (18%)
3	PG4	A	203	-	12,12,12	0.64	0	11,11,11	0.98	1 (9%)
4	OXY	A	205	-	1,1,1	0.09	0	-		
2	GOL	A	201	-	5,5,5	1.00	0	5,5,5	1.34	1 (20%)
7	NT0	G	301	-	27,31,31	2.71	14 (51%)	34,41,41	3.80	14 (41%)
3	PG4	E	202	-	12,12,12	0.92	1 (8%)	11,11,11	1.16	2 (18%)
3	PG4	A	204	-	12,12,12	0.91	0	11,11,11	1.46	2 (18%)
6	PGE	D	201	-	9,9,9	0.26	0	8,8,8	0.12	0
2	GOL	H	201	-	5,5,5	0.39	0	5,5,5	1.11	0
3	PG4	B	401	-	12,12,12	0.59	0	11,11,11	1.36	2 (18%)
3	PG4	C	201	-	12,12,12	0.87	0	11,11,11	1.65	3 (27%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	PG4	A	202	-	-	6/10/10/10	-
3	PG4	E	201	-	-	7/10/10/10	-
3	PG4	A	203	-	-	3/10/10/10	-
2	GOL	A	201	-	-	3/4/4/4	-
7	NT0	G	301	-	-	4/14/16/16	0/4/4/4
3	PG4	E	202	-	-	7/10/10/10	-
3	PG4	A	204	-	-	6/10/10/10	-
6	PGE	D	201	-	-	4/7/7/7	-
2	GOL	H	201	-	-	2/4/4/4	-
3	PG4	B	401	-	-	6/10/10/10	-
3	PG4	C	201	-	-	5/10/10/10	-

All (15) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
7	G	301	NT0	C03-C04	-6.11	1.46	1.51
7	G	301	NT0	C10-N11	-5.48	1.26	1.35
7	G	301	NT0	C14-C13	4.19	1.55	1.48
7	G	301	NT0	C02-N09	4.16	1.44	1.35
7	G	301	NT0	C21-N20	-3.78	1.27	1.34
7	G	301	NT0	C28-C23	-3.73	1.30	1.38
7	G	301	NT0	C26-C25	-2.99	1.30	1.38
7	G	301	NT0	C27-C28	-2.81	1.33	1.38
7	G	301	NT0	C03-C02	2.41	1.57	1.51
7	G	301	NT0	C22-C21	2.30	1.53	1.51
7	G	301	NT0	C12-C13	-2.27	1.33	1.39
3	E	202	PG4	O3-C5	-2.17	1.32	1.42
7	G	301	NT0	C05-C04	-2.14	1.36	1.39
7	G	301	NT0	C17-C16	-2.09	1.32	1.38
7	G	301	NT0	C25-C24	-2.03	1.34	1.38

All (27) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
7	G	301	NT0	C21-C10-N09	9.03	130.81	118.40
7	G	301	NT0	C03-C02-N09	8.11	131.53	114.77
7	G	301	NT0	C21-C10-N11	-7.52	115.23	122.25
7	G	301	NT0	C13-N20-C21	7.41	124.78	118.35
7	G	301	NT0	C23-C22-C21	6.71	129.62	112.40
7	G	301	NT0	C22-C21-N20	-5.52	105.36	116.25
7	G	301	NT0	C14-C13-N20	5.27	123.51	116.02
7	G	301	NT0	O01-C02-N09	-4.84	114.79	123.63
7	G	301	NT0	C04-C03-C02	4.52	122.39	113.39
7	G	301	NT0	C12-C13-N20	-4.11	114.55	119.82
7	G	301	NT0	C16-C15-C14	3.91	125.47	120.56
7	G	301	NT0	O01-C02-C03	-3.81	113.36	122.03
7	G	301	NT0	C12-N11-C10	3.77	123.61	116.05
3	E	201	PG4	C3-O2-C2	3.58	128.81	113.29
3	C	201	PG4	O2-C3-C4	-3.15	96.19	110.39
3	A	204	PG4	O3-C4-C3	2.95	123.69	110.39
3	A	204	PG4	O4-C6-C5	2.90	123.49	110.39
3	C	201	PG4	C3-O2-C2	2.77	125.31	113.29
3	B	401	PG4	C7-O4-C6	2.75	125.21	113.29
7	G	301	NT0	C05-C06-C07	-2.54	103.90	112.92
3	E	201	PG4	O4-C6-C5	2.40	121.23	110.39
2	A	201	GOL	O2-C2-C1	2.40	119.70	109.12
3	E	202	PG4	O5-C8-C7	-2.35	98.20	111.81

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	E	202	PG4	C3-O2-C2	2.19	122.79	113.29
3	C	201	PG4	O4-C6-C5	-2.11	100.87	110.39
3	A	203	PG4	O1-C1-C2	-2.08	99.73	111.81
3	B	401	PG4	O3-C5-C6	-2.06	101.11	110.39

There are no chirality outliers.

All (53) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	201	GOL	C1-C2-C3-O3
2	H	201	GOL	C1-C2-C3-O3
2	H	201	GOL	O2-C2-C3-O3
7	G	301	NT0	C10-C21-C22-C23
7	G	301	NT0	N20-C21-C22-C23
3	E	201	PG4	C5-C6-O4-C7
3	B	401	PG4	C8-C7-O4-C6
3	A	204	PG4	C6-C5-O3-C4
3	A	203	PG4	O2-C3-C4-O3
3	B	401	PG4	O2-C3-C4-O3
3	E	201	PG4	O3-C5-C6-O4
3	C	201	PG4	O2-C3-C4-O3
6	D	201	PGE	O2-C3-C4-O3
2	A	201	GOL	O2-C2-C3-O3
3	B	401	PG4	O3-C5-C6-O4
3	E	201	PG4	C4-C3-O2-C2
3	E	202	PG4	C6-C5-O3-C4
3	A	204	PG4	O4-C7-C8-O5
3	B	401	PG4	O4-C7-C8-O5
3	A	202	PG4	O2-C3-C4-O3
3	E	202	PG4	O1-C1-C2-O2
3	A	203	PG4	O3-C5-C6-O4
3	C	201	PG4	O3-C5-C6-O4
3	A	202	PG4	O3-C5-C6-O4
3	E	202	PG4	O2-C3-C4-O3
3	A	202	PG4	O4-C7-C8-O5
3	E	201	PG4	O4-C7-C8-O5
3	C	201	PG4	O1-C1-C2-O2
3	A	203	PG4	C1-C2-O2-C3
6	D	201	PGE	C6-C5-O3-C4
3	A	204	PG4	C8-C7-O4-C6
3	E	202	PG4	C1-C2-O2-C3
3	B	401	PG4	C3-C4-O3-C5

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms
3	B	401	PG4	C6-C5-O3-C4
3	E	202	PG4	C3-C4-O3-C5
3	A	202	PG4	C6-C5-O3-C4
3	E	202	PG4	C5-C6-O4-C7
3	E	201	PG4	O1-C1-C2-O2
3	A	202	PG4	C8-C7-O4-C6
6	D	201	PGE	O3-C5-C6-O4
3	A	202	PG4	C5-C6-O4-C7
3	A	204	PG4	C4-C3-O2-C2
6	D	201	PGE	C1-C2-O2-C3
3	E	201	PG4	C3-C4-O3-C5
3	A	204	PG4	O3-C5-C6-O4
3	C	201	PG4	C4-C3-O2-C2
3	E	202	PG4	O4-C7-C8-O5
3	E	201	PG4	C8-C7-O4-C6
3	C	201	PG4	C5-C6-O4-C7
7	G	301	NT0	N09-C02-C03-C04
7	G	301	NT0	O01-C02-C03-C04
2	A	201	GOL	O1-C1-C2-C3
3	A	204	PG4	O2-C3-C4-O3

There are no ring outliers.

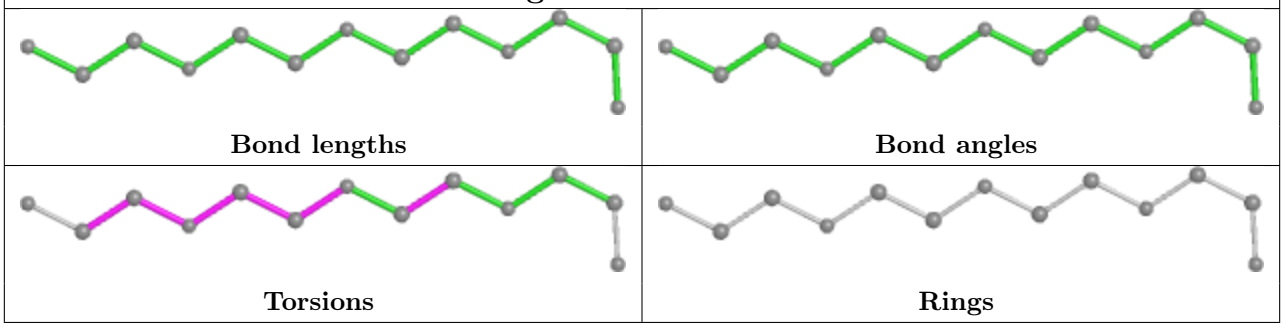
12 monomers are involved in 55 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	202	PG4	1	0
3	E	201	PG4	9	0
3	A	203	PG4	1	0
4	A	205	OXY	2	0
2	A	201	GOL	3	0
7	G	301	NT0	15	0
3	E	202	PG4	5	0
3	A	204	PG4	7	0
6	D	201	PGE	2	0
2	H	201	GOL	4	0
3	B	401	PG4	2	0
3	C	201	PG4	5	0

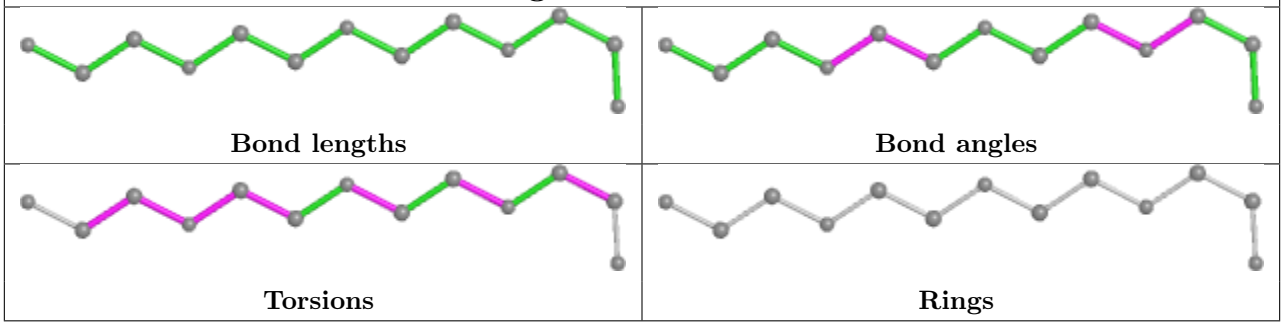
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is

within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

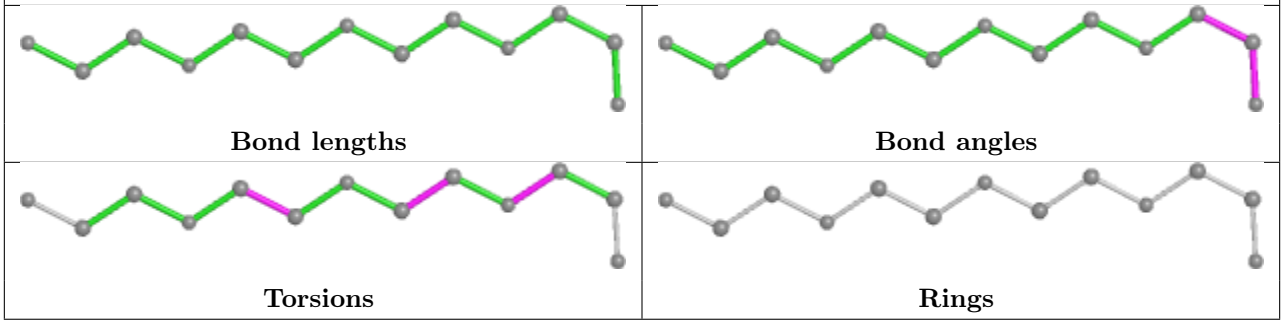
Ligand PG4 A 202



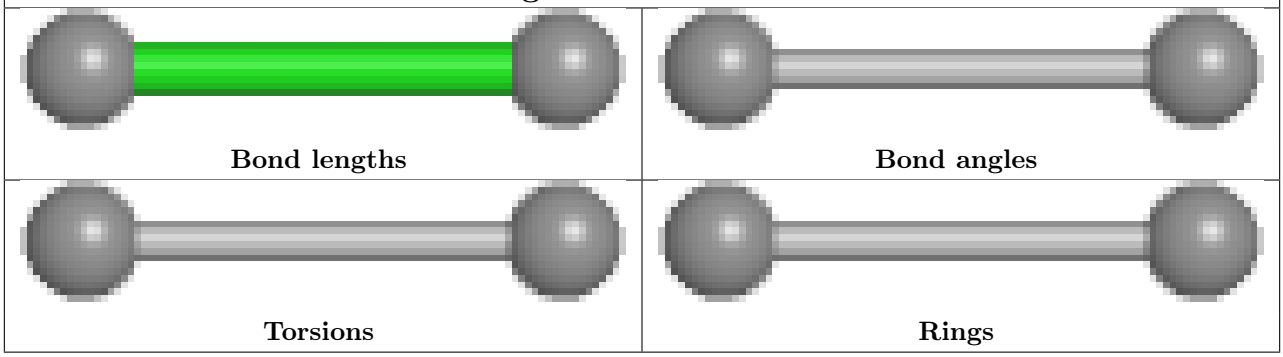
Ligand PG4 E 201



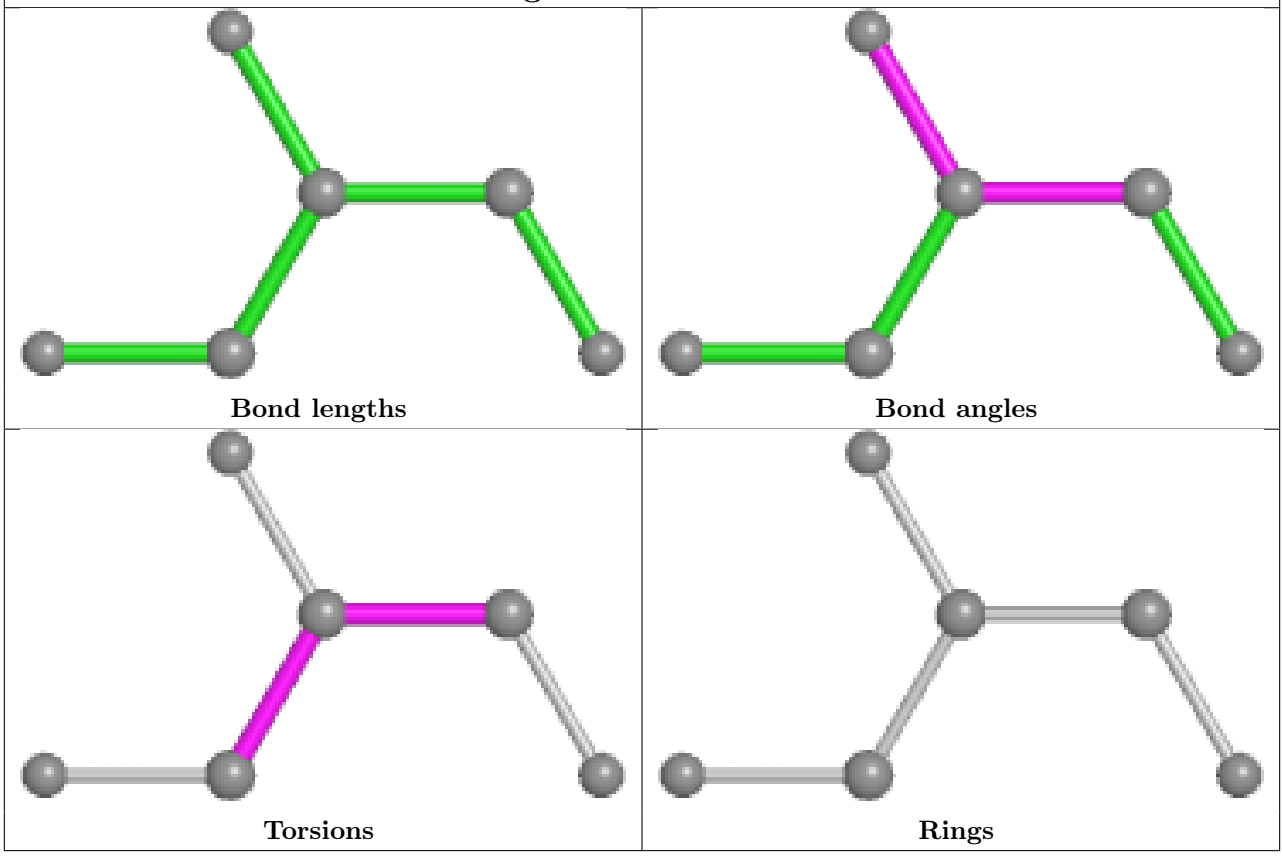
Ligand PG4 A 203



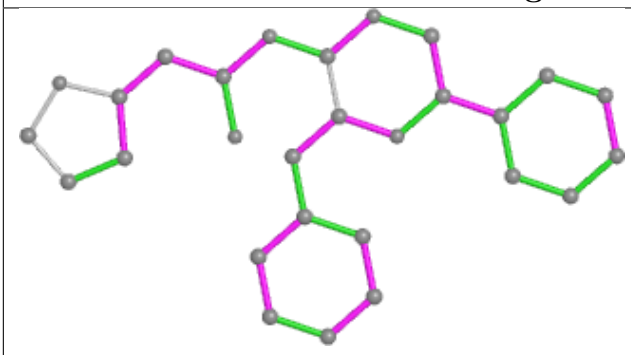
Ligand OXY A 205



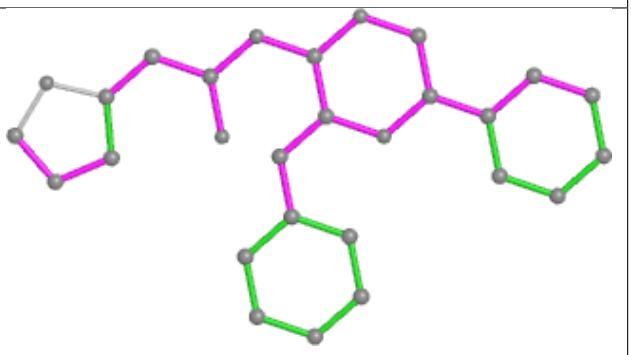
Ligand GOL A 201



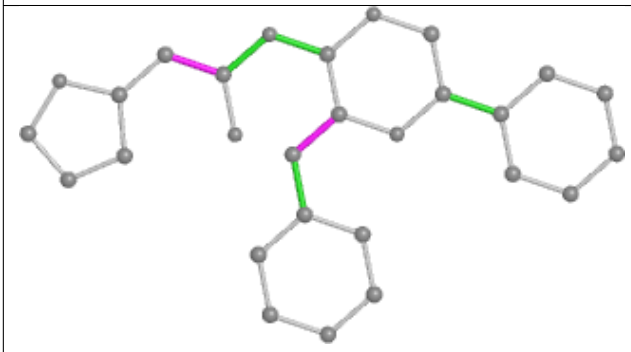
Ligand NT0 G 301



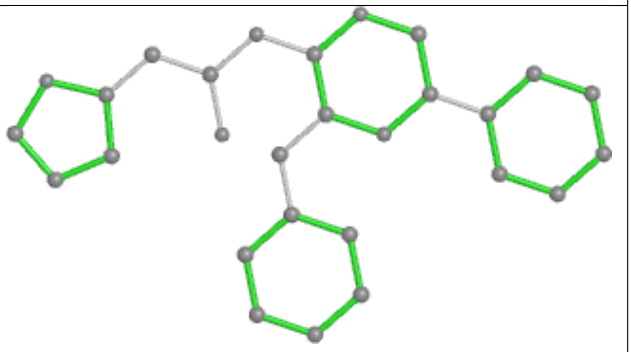
Bond lengths



Bond angles

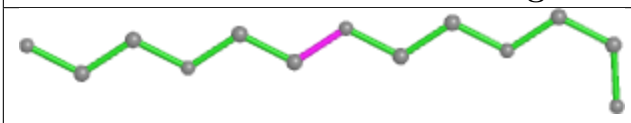


Torsions

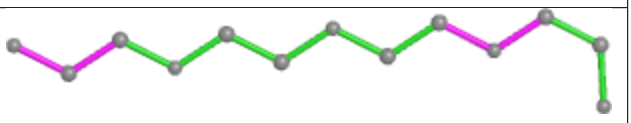


Rings

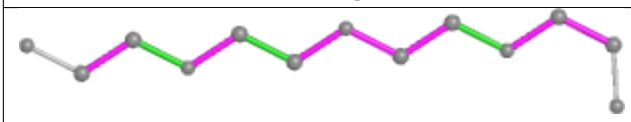
Ligand PG4 E 202



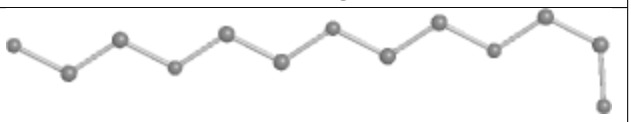
Bond lengths



Bond angles

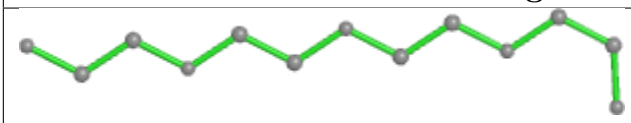


Torsions

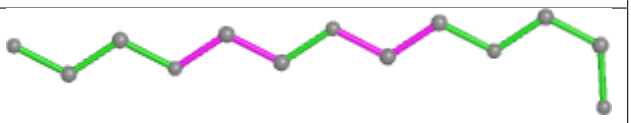


Rings

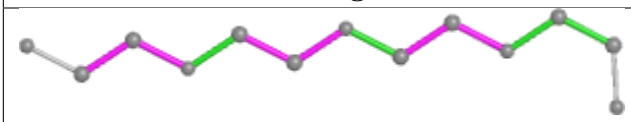
Ligand PG4 A 204



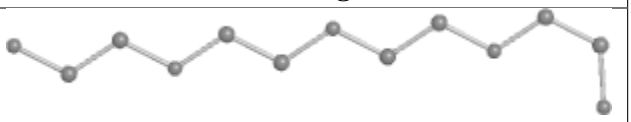
Bond lengths



Bond angles

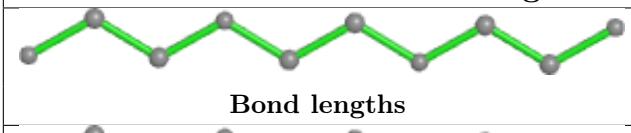


Torsions

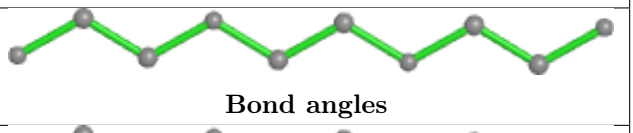


Rings

Ligand PGE D 201

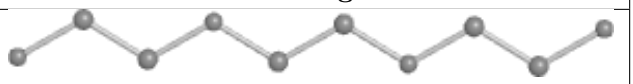


Bond lengths



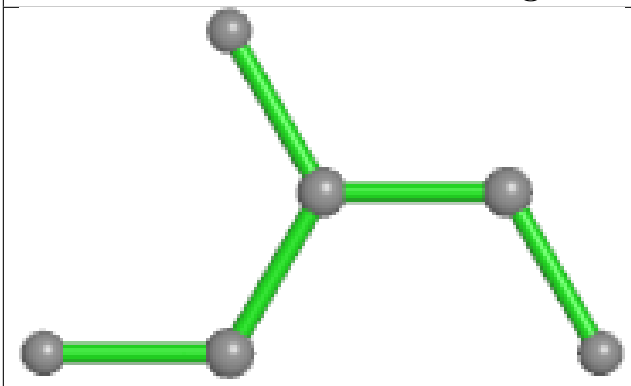
Bond angles

Torsions

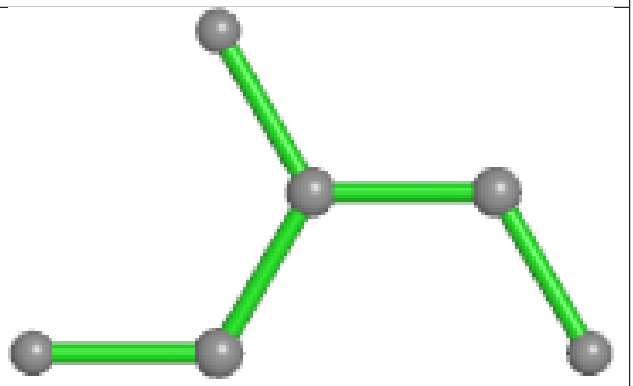


Rings

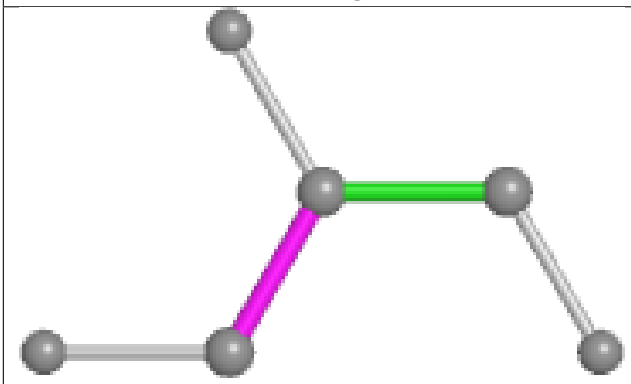
Ligand GOL H 201



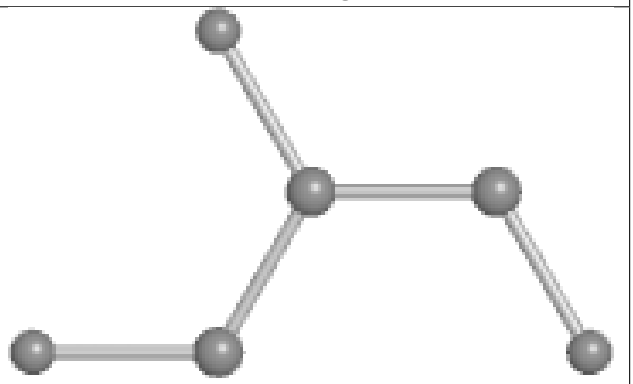
Bond lengths



Bond angles

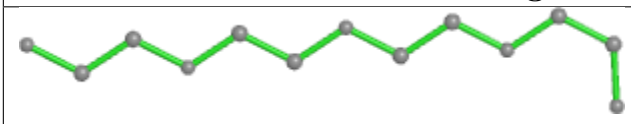


Torsions

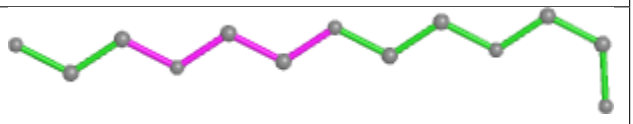


Rings

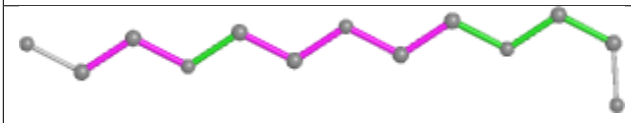
Ligand PG4 B 401



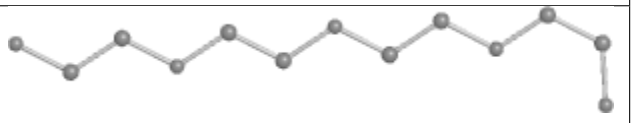
Bond lengths



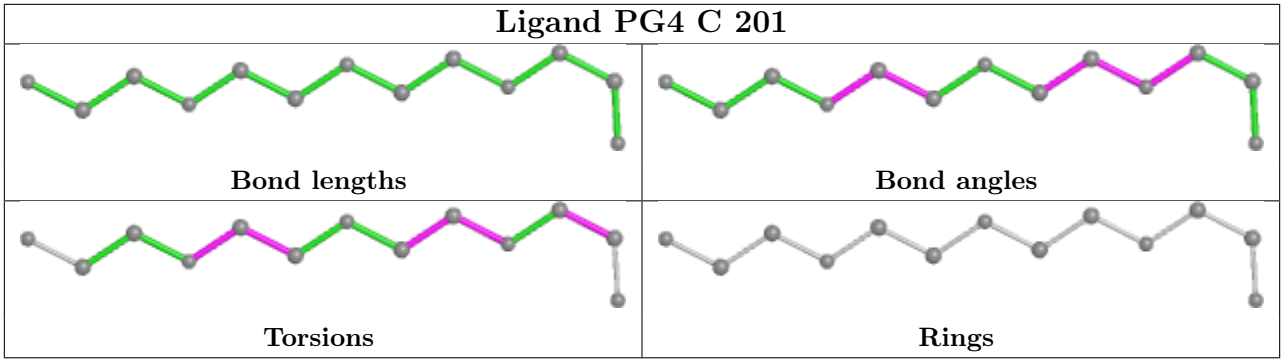
Bond angles



Torsions



Rings



5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95^{th} percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled 'Q< 0.9' lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å^2)	Q<0.9
1	A	171/181 (94%)	0.42	10 (5%) 23 25	20, 37, 56, 93	0
1	B	171/181 (94%)	0.27	8 (4%) 31 35	19, 31, 52, 70	0
1	C	171/181 (94%)	0.14	2 (1%) 79 82	18, 31, 49, 96	0
1	D	171/181 (94%)	0.38	16 (9%) 8 9	17, 30, 57, 127	0
1	E	171/181 (94%)	0.45	14 (8%) 11 13	19, 33, 59, 126	0
1	F	171/181 (94%)	0.11	7 (4%) 37 41	18, 29, 46, 78	0
1	G	171/181 (94%)	0.29	16 (9%) 8 9	17, 28, 55, 97	0
1	H	172/181 (95%)	0.28	10 (5%) 23 25	17, 30, 53, 88	0
All	All	1369/1448 (94%)	0.29	83 (6%) 21 23	17, 31, 55, 127	0

All (83) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	G	65	LEU	12.3
1	H	67	GLY	7.6
1	D	76	ILE	6.7
1	D	33	ASN	6.4
1	E	32	GLN	6.0
1	E	33	ASN	5.2
1	F	65	LEU	4.7
1	B	32	GLN	4.6
1	H	32	GLN	4.4
1	A	79	VAL	4.0
1	E	167	ILE	3.9
1	A	-1	MET	3.9
1	H	64	GLY	3.9
1	E	29	SER	3.8
1	E	31	PHE	3.8
1	D	79	VAL	3.6

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	H	66	SER	3.5
1	A	101	GLY	3.4
1	E	28	SER	3.3
1	A	48	GLY	3.3
1	G	29	SER	3.3
1	C	32	GLN	3.2
1	G	33	ASN	3.2
1	B	33	ASN	3.2
1	D	48	GLY	3.2
1	H	26	GLY	3.2
1	F	64	GLY	3.1
1	F	67	GLY	3.1
1	B	76	ILE	3.0
1	F	169	ALA	3.0
1	G	31	PHE	3.0
1	A	100	ASP	2.9
1	D	28	SER	2.8
1	D	32	GLN	2.8
1	D	65	LEU	2.8
1	H	68	ASP	2.8
1	D	49	GLU	2.8
1	H	-2	ASN	2.7
1	D	167	ILE	2.7
1	G	32	GLN	2.7
1	E	25	GLY	2.7
1	F	68	ASP	2.7
1	H	27	VAL	2.7
1	D	75	LYS	2.7
1	G	64	GLY	2.6
1	H	167	ILE	2.6
1	G	75	LYS	2.6
1	E	69	GLN	2.6
1	G	80	VAL	2.6
1	D	168	LEU	2.5
1	B	67	GLY	2.5
1	G	169	ALA	2.5
1	E	16	TYR	2.5
1	G	79	VAL	2.5
1	E	-1	MET	2.4
1	E	27	VAL	2.4
1	G	81	TYR	2.4
1	E	73	ILE	2.3

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	G	-1	MET	2.3
1	B	168	LEU	2.3
1	G	41	ILE	2.3
1	G	168	LEU	2.3
1	B	49	GLU	2.3
1	A	132	TRP	2.3
1	A	29	SER	2.2
1	F	66	SER	2.2
1	D	169	ALA	2.2
1	D	67	GLY	2.2
1	B	10	TRP	2.2
1	D	50	ASN	2.2
1	D	68	ASP	2.2
1	C	167	ILE	2.2
1	D	73	ILE	2.2
1	G	59	ILE	2.2
1	F	75	LYS	2.2
1	A	32	GLN	2.1
1	A	33	ASN	2.1
1	H	75	LYS	2.1
1	E	66	SER	2.1
1	G	167	ILE	2.1
1	A	111	GLY	2.0
1	E	135	ASN	2.0
1	B	167	ILE	2.0

6.2 Non-standard residues in protein, DNA, RNA chains (i)

There are no non-standard protein/DNA/RNA residues in this entry.

6.3 Carbohydrates (i)

There are no monosaccharides in this entry.

6.4 Ligands (i)

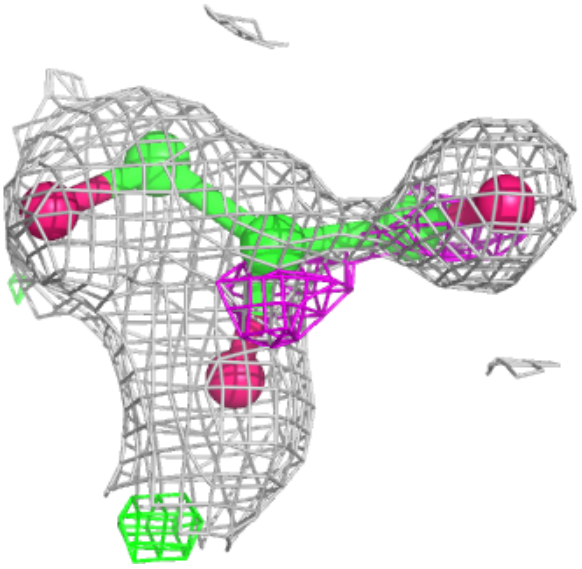
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

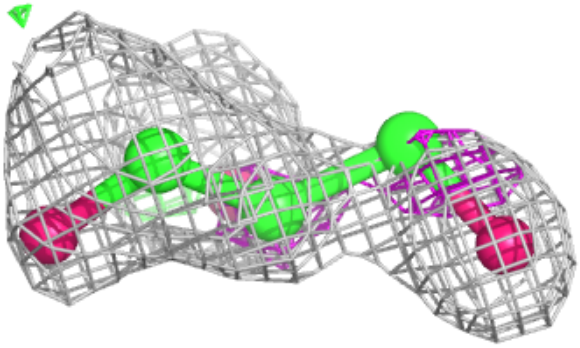
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	GOL	H	201	6/6	0.67	0.24	30,36,42,62	0
3	PG4	B	401	13/13	0.81	0.15	36,40,46,47	0
3	PG4	A	204	13/13	0.82	0.15	34,42,51,52	0
7	NT0	G	301	28/28	0.82	0.18	24,35,50,54	0
3	PG4	A	203	13/13	0.84	0.16	41,45,53,56	0
2	GOL	A	201	6/6	0.86	0.17	33,43,45,49	0
3	PG4	E	201	13/13	0.87	0.15	28,40,58,59	0
3	PG4	A	202	13/13	0.91	0.11	34,47,66,70	0
6	PGE	D	201	10/10	0.92	0.09	43,48,54,54	0
3	PG4	E	202	13/13	0.92	0.20	26,29,31,33	0
3	PG4	C	201	13/13	0.94	0.10	32,43,49,57	0
4	OXY	A	205	2/2	0.94	0.10	32,32,32,41	0
5	CL	G	303	1/1	0.97	0.05	33,33,33,33	0
5	CL	F	202	1/1	0.98	0.05	33,33,33,33	0
5	CL	B	404	1/1	0.98	0.06	34,34,34,34	0
5	CL	G	304	1/1	0.98	0.06	32,32,32,32	0
5	CL	E	206	1/1	0.98	0.10	30,30,30,30	0
5	CL	F	201	1/1	0.98	0.06	31,31,31,31	0
5	CL	E	205	1/1	0.99	0.03	46,46,46,46	0
5	CL	A	207	1/1	0.99	0.05	32,32,32,32	0
5	CL	A	208	1/1	0.99	0.04	32,32,32,32	0
5	CL	A	206	1/1	0.99	0.04	31,31,31,31	0
5	CL	G	302	1/1	0.99	0.06	26,26,26,26	0
5	CL	D	202	1/1	0.99	0.04	26,26,26,26	0
5	CL	D	203	1/1	0.99	0.06	26,26,26,26	0
5	CL	G	305	1/1	0.99	0.08	28,28,28,28	0
5	CL	H	202	1/1	0.99	0.05	29,29,29,29	0
5	CL	H	203	1/1	0.99	0.05	34,34,34,34	0
5	CL	E	203	1/1	0.99	0.14	22,22,22,22	0
5	CL	E	204	1/1	0.99	0.04	34,34,34,34	0
5	CL	B	403	1/1	1.00	0.06	32,32,32,32	0
5	CL	B	402	1/1	1.00	0.13	22,22,22,22	1
5	CL	C	202	1/1	1.00	0.10	21,21,21,21	1
5	CL	C	203	1/1	1.00	0.03	31,31,31,31	0

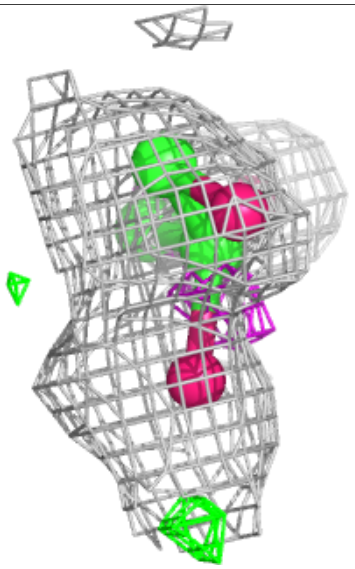
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

Electron density around GOL H 201:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

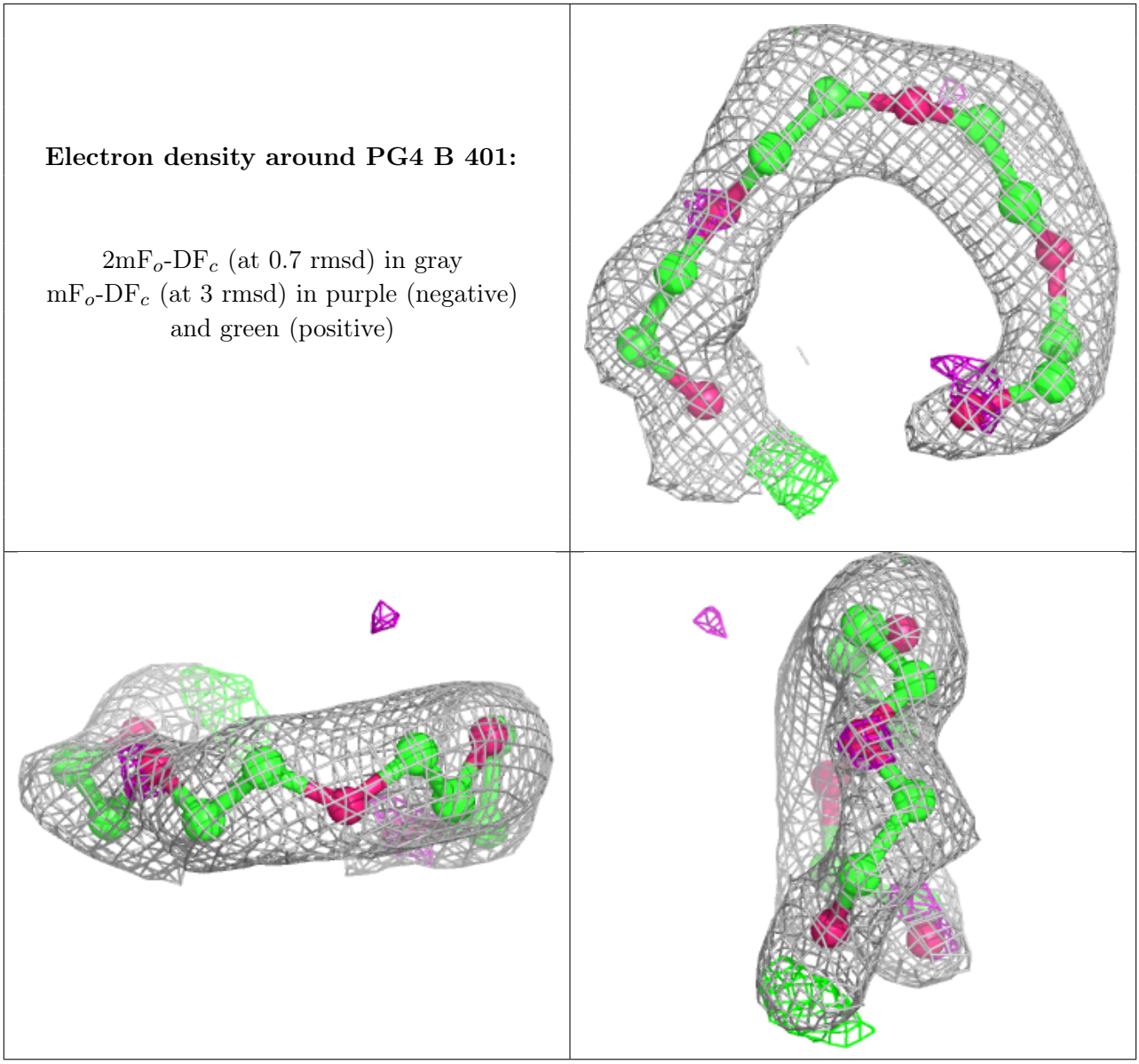






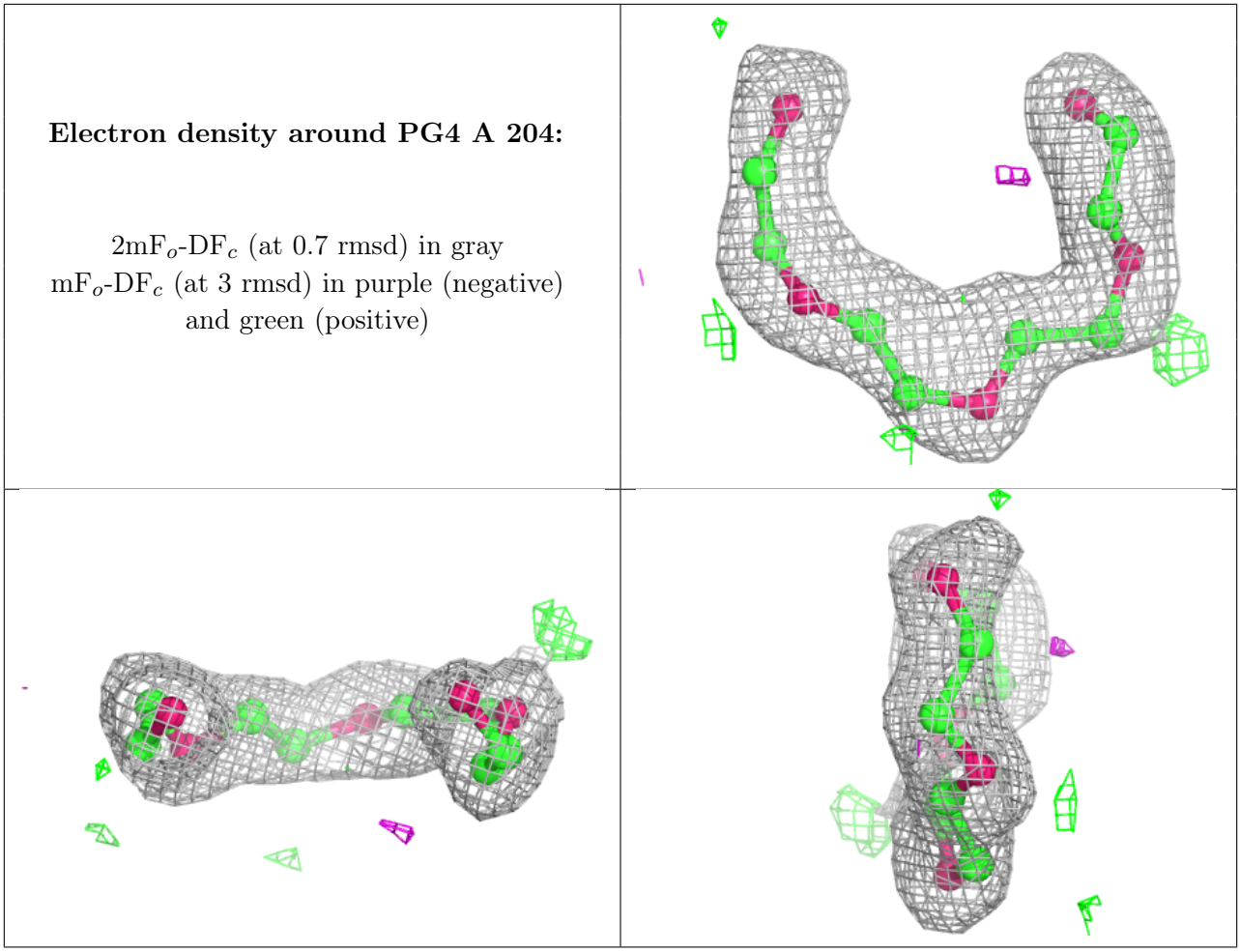
Electron density around PG4 B 401:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



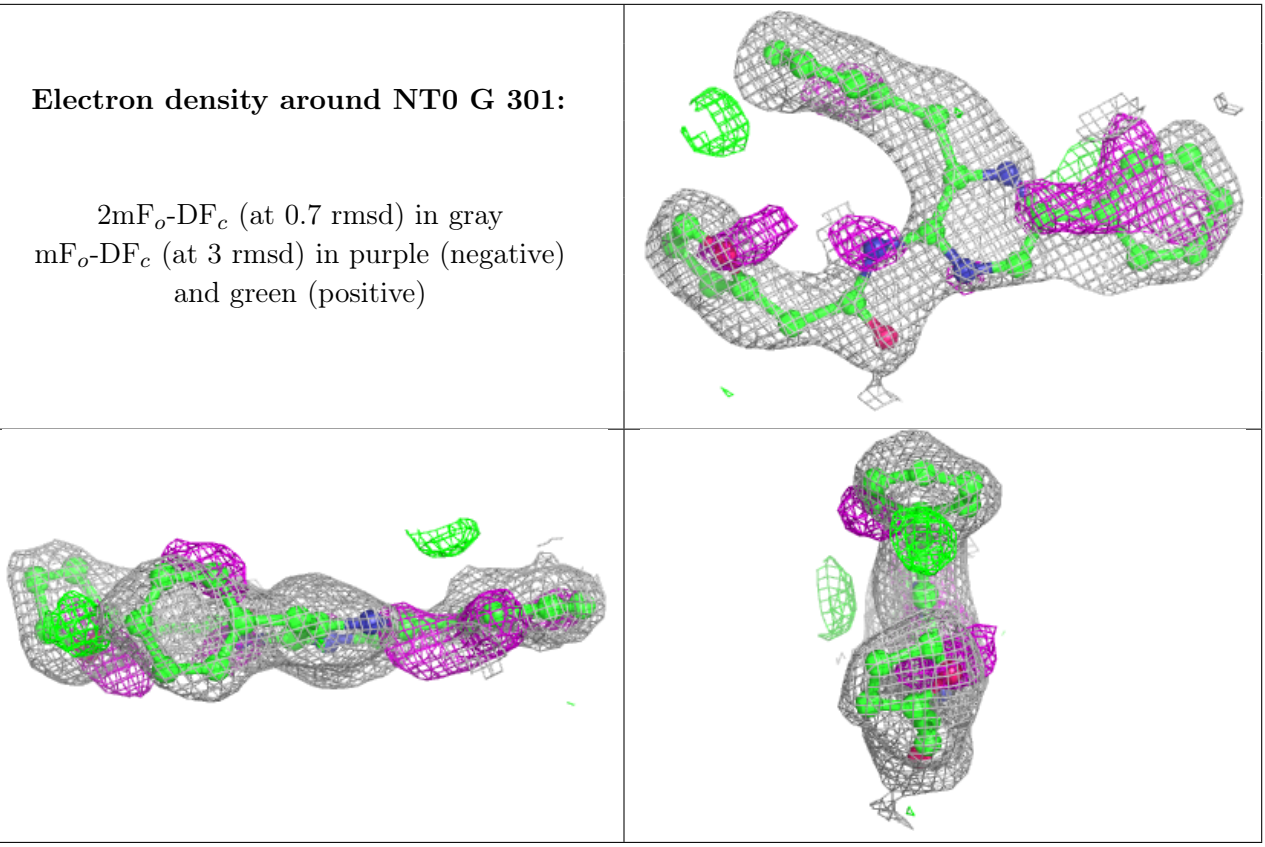
Electron density around PG4 A 204:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



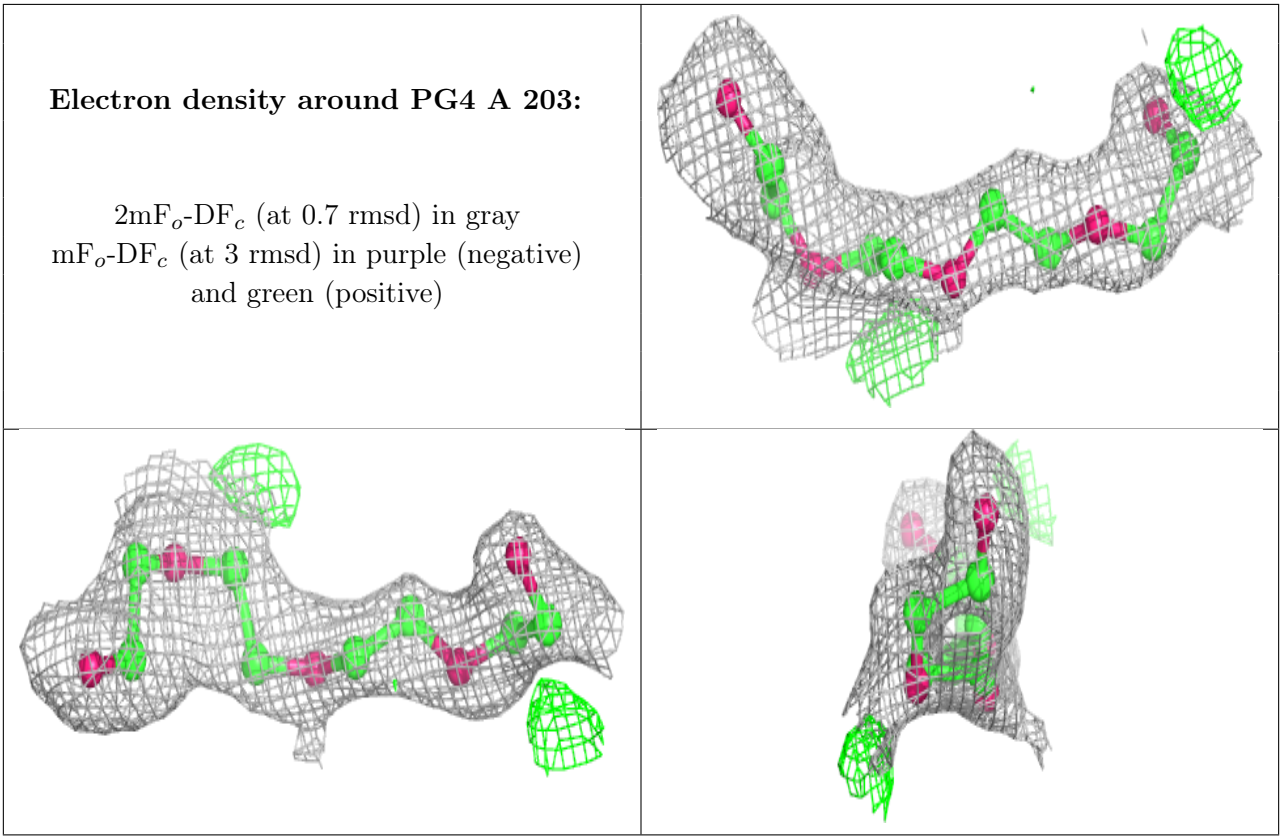
Electron density around NT0 G 301:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



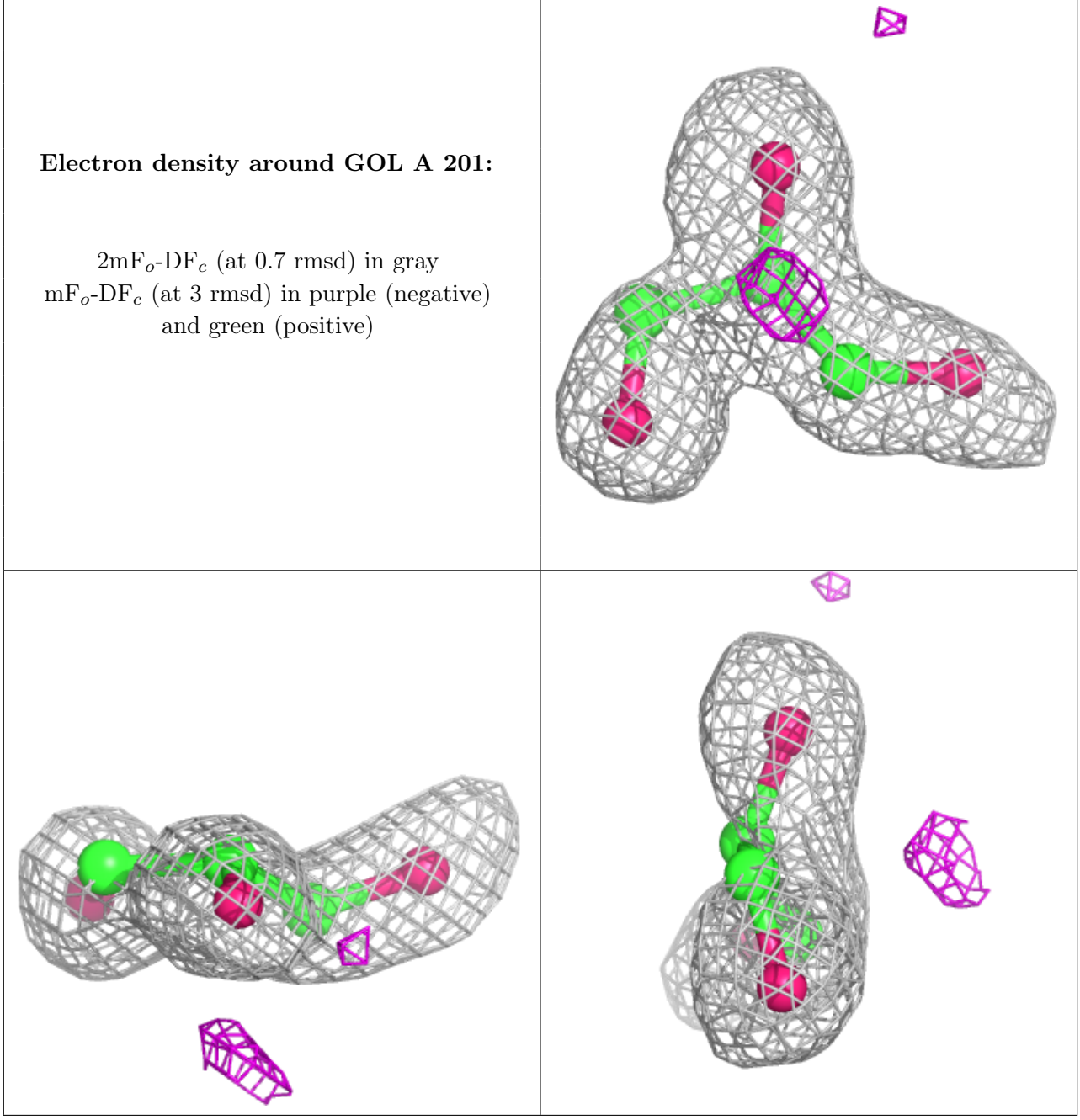
Electron density around PG4 A 203:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



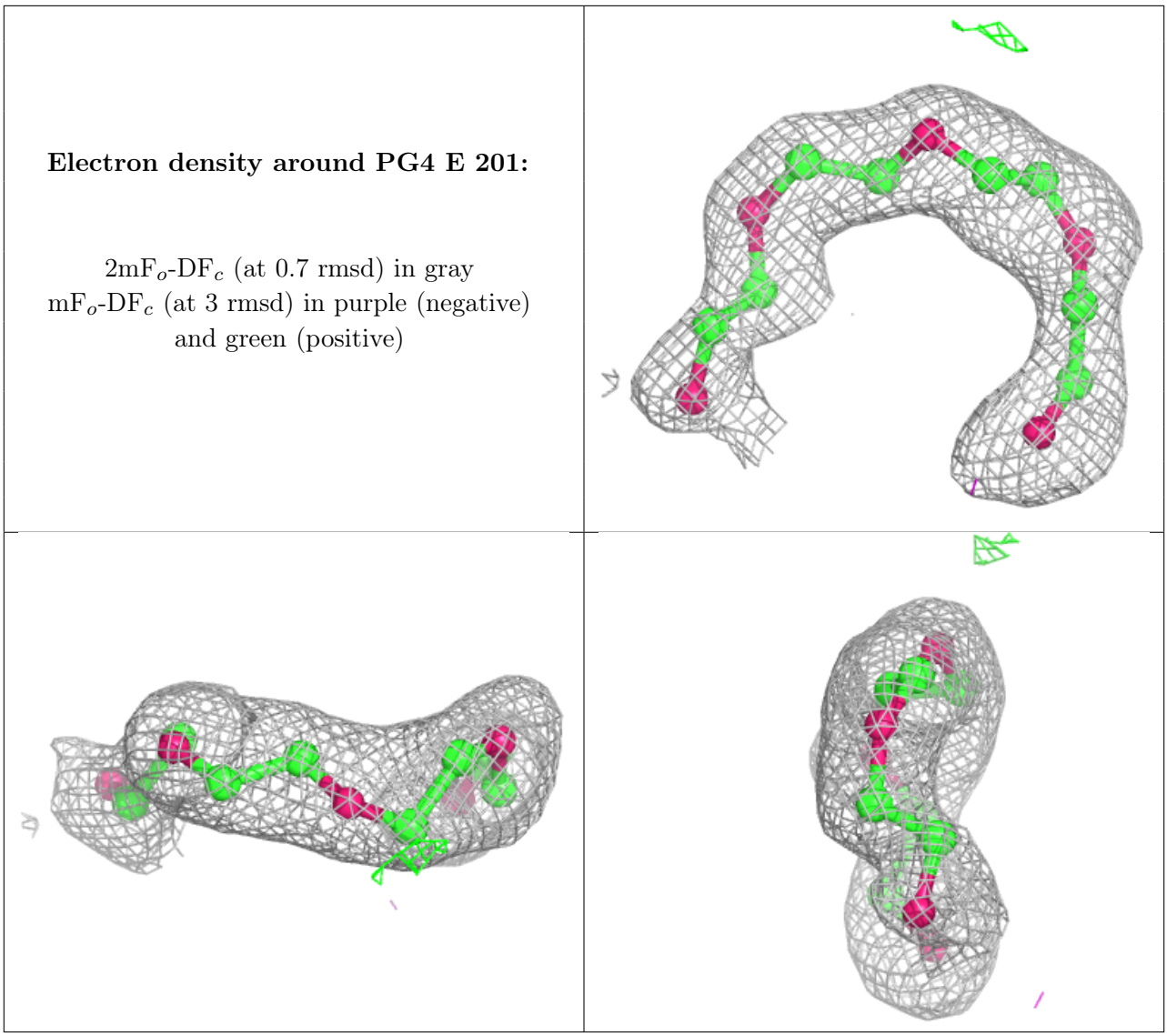
Electron density around GOL A 201:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



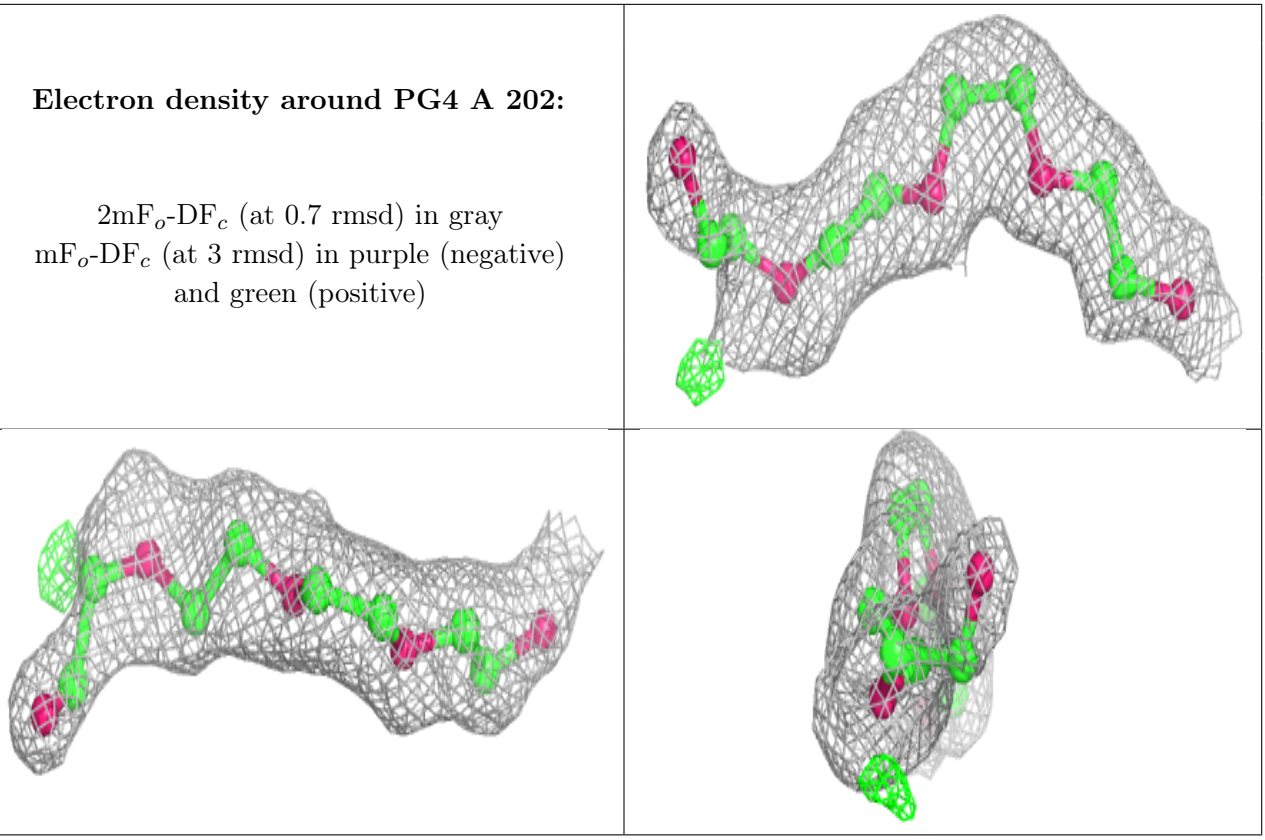
Electron density around PG4 E 201:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



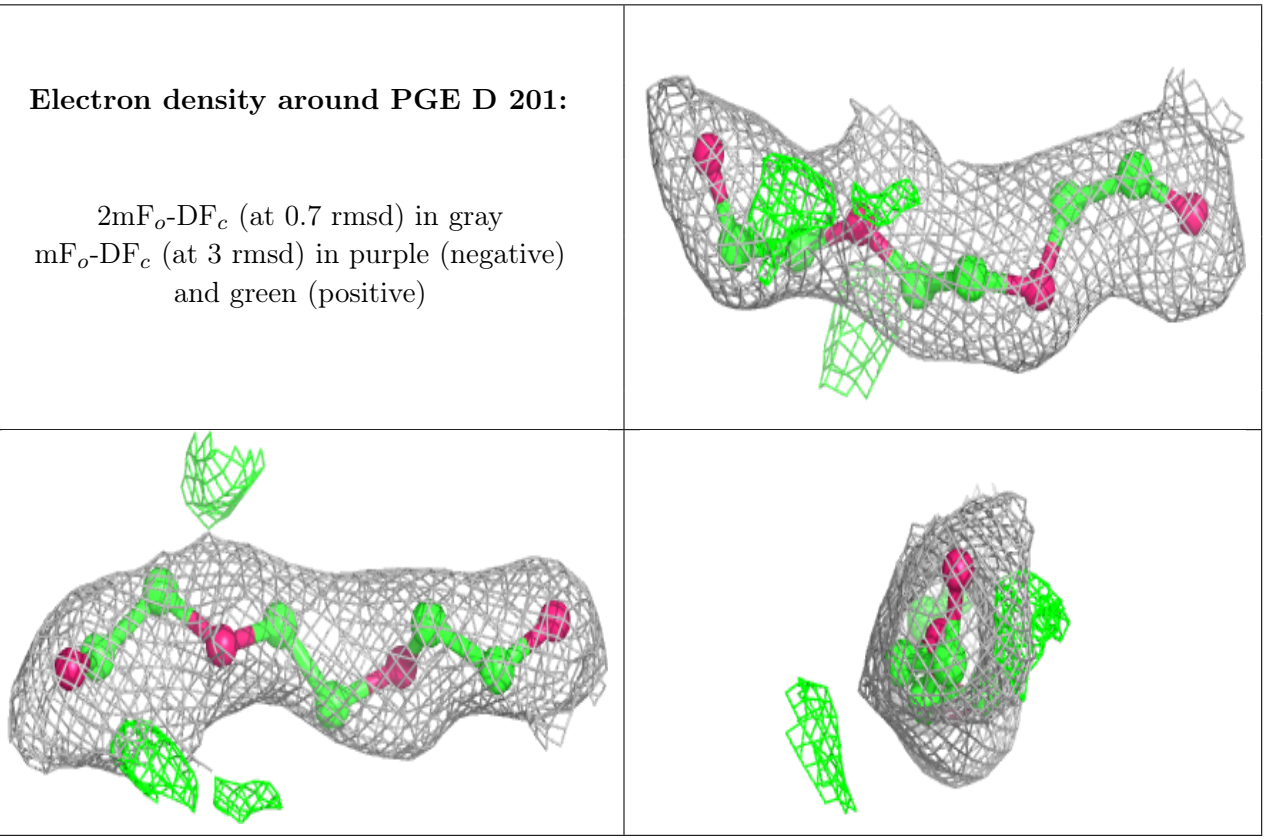
Electron density around PG4 A 202:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



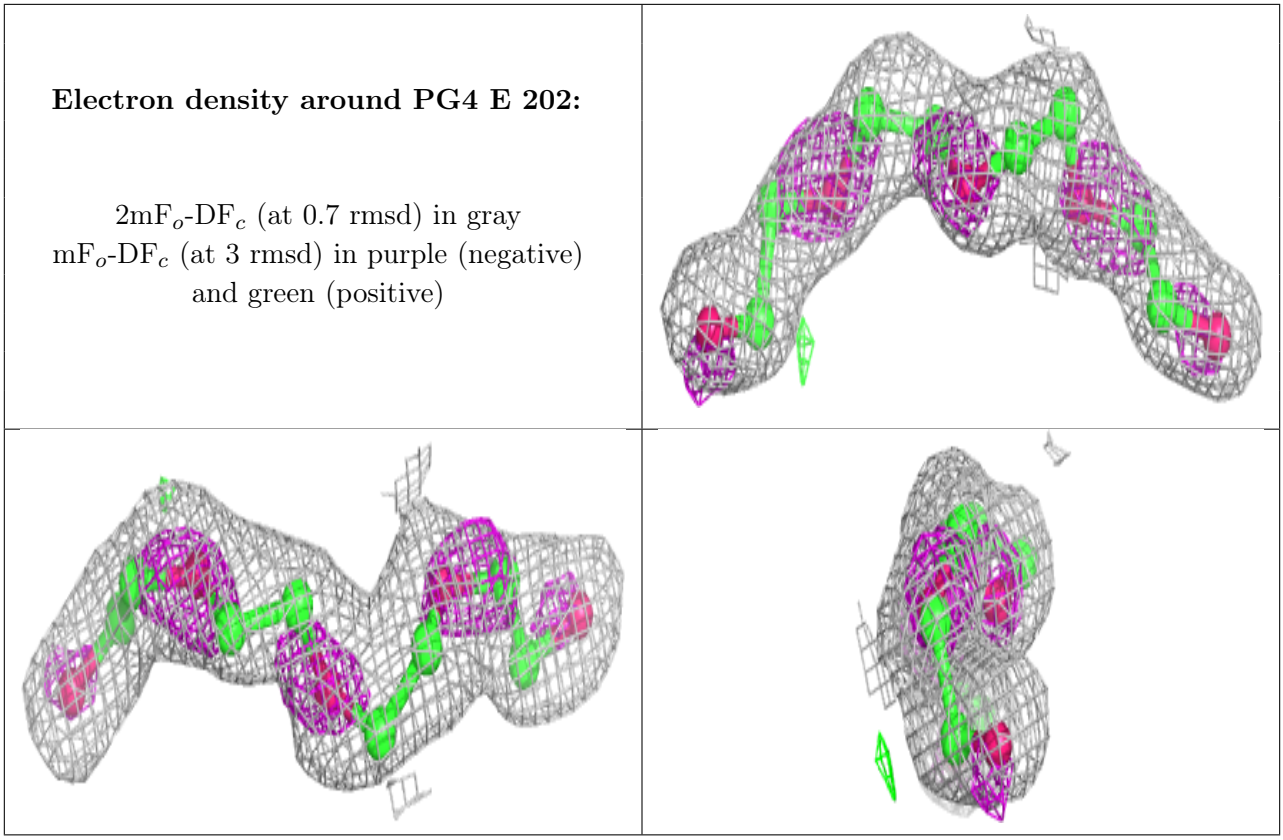
Electron density around PGE D 201:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



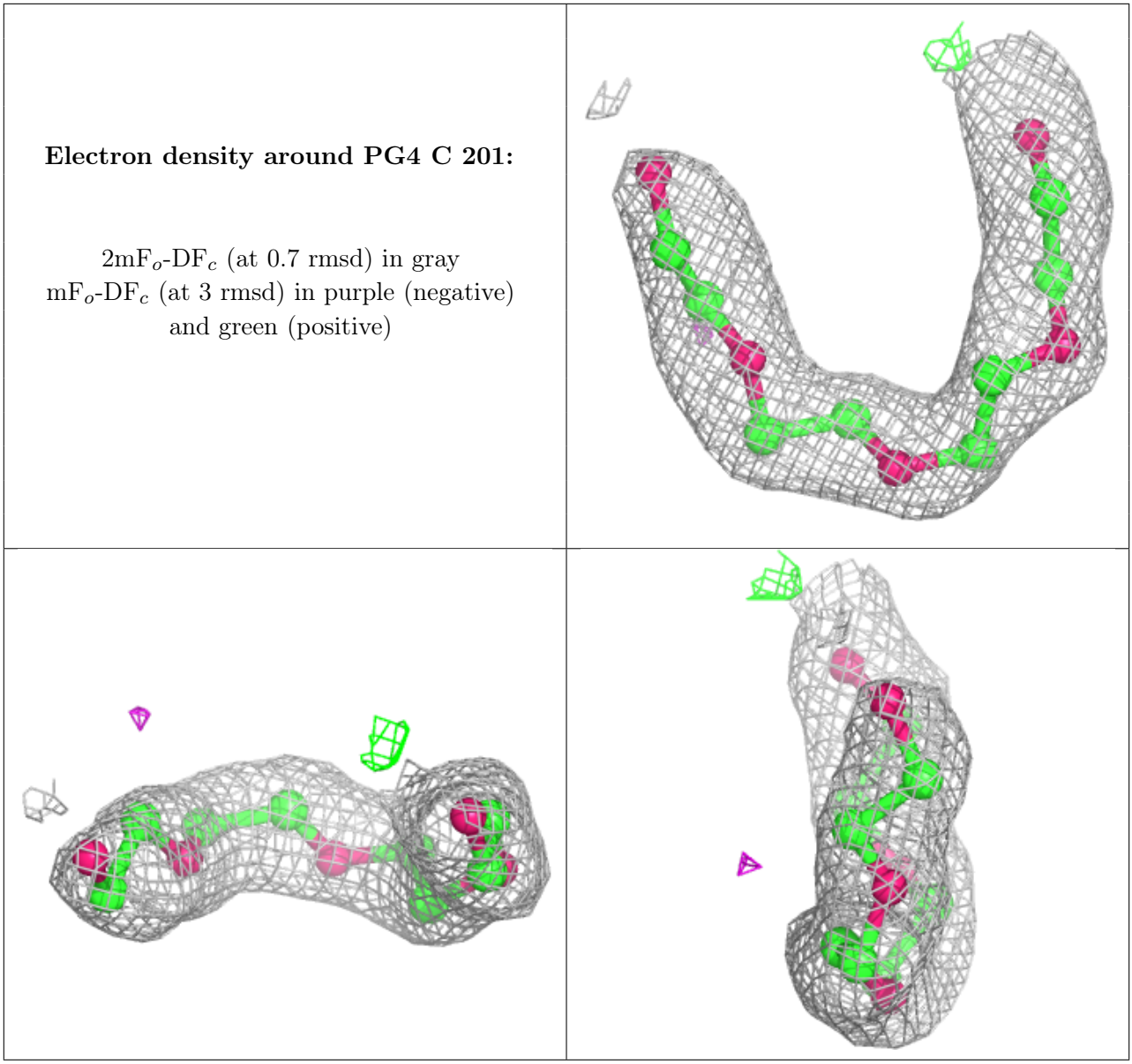
Electron density around PG4 E 202:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



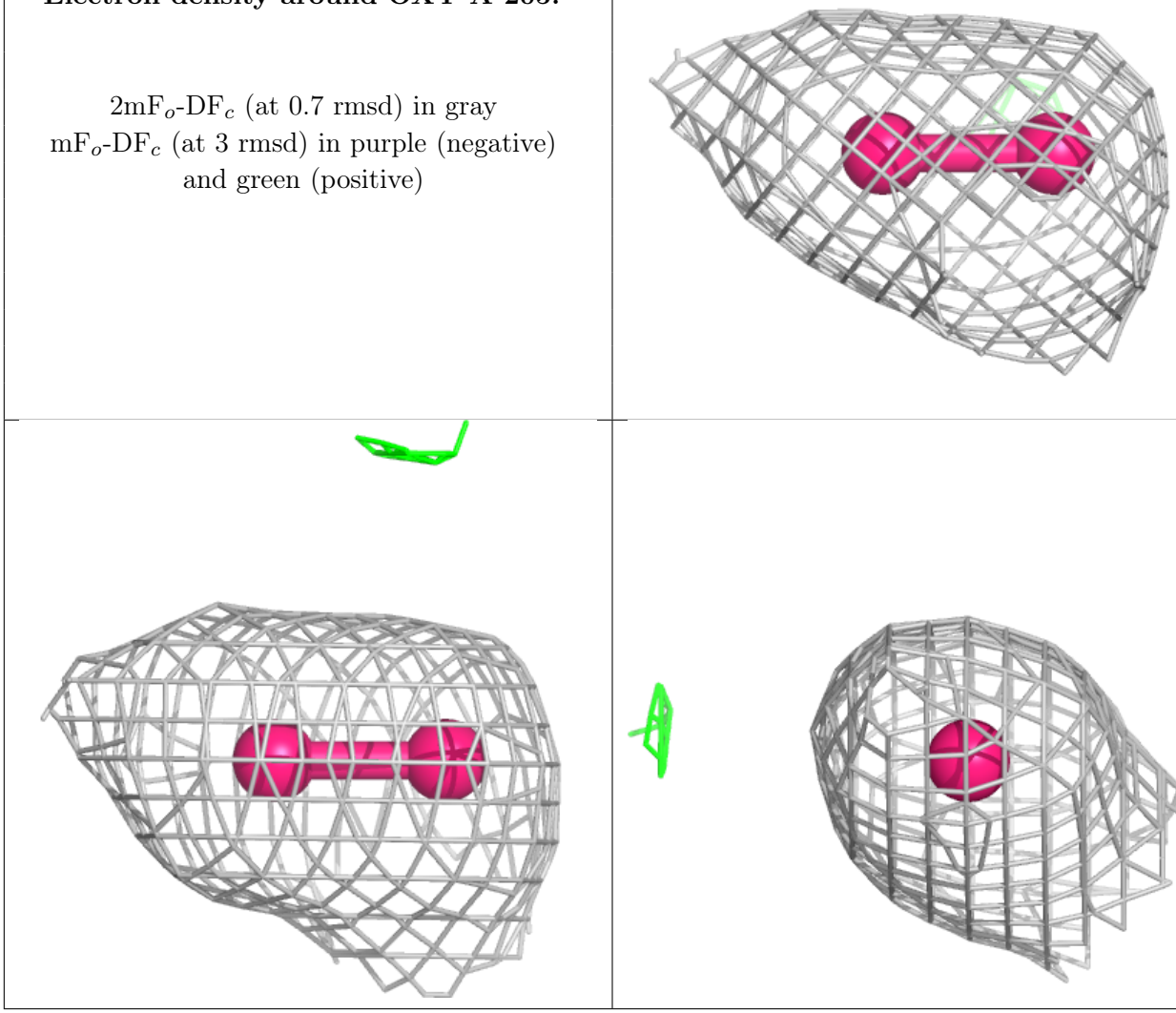
Electron density around PG4 C 201:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



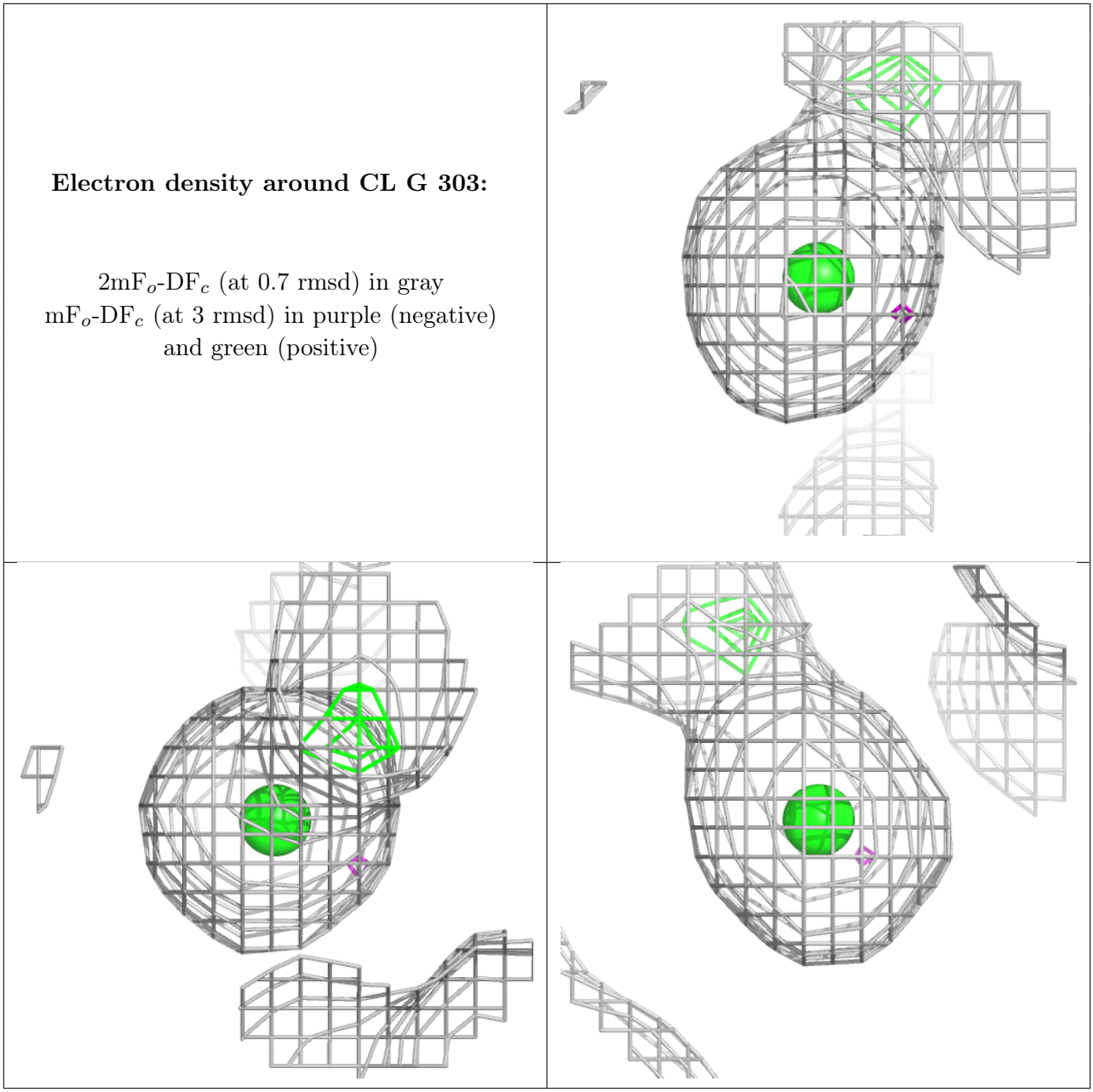
Electron density around OXY A 205:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



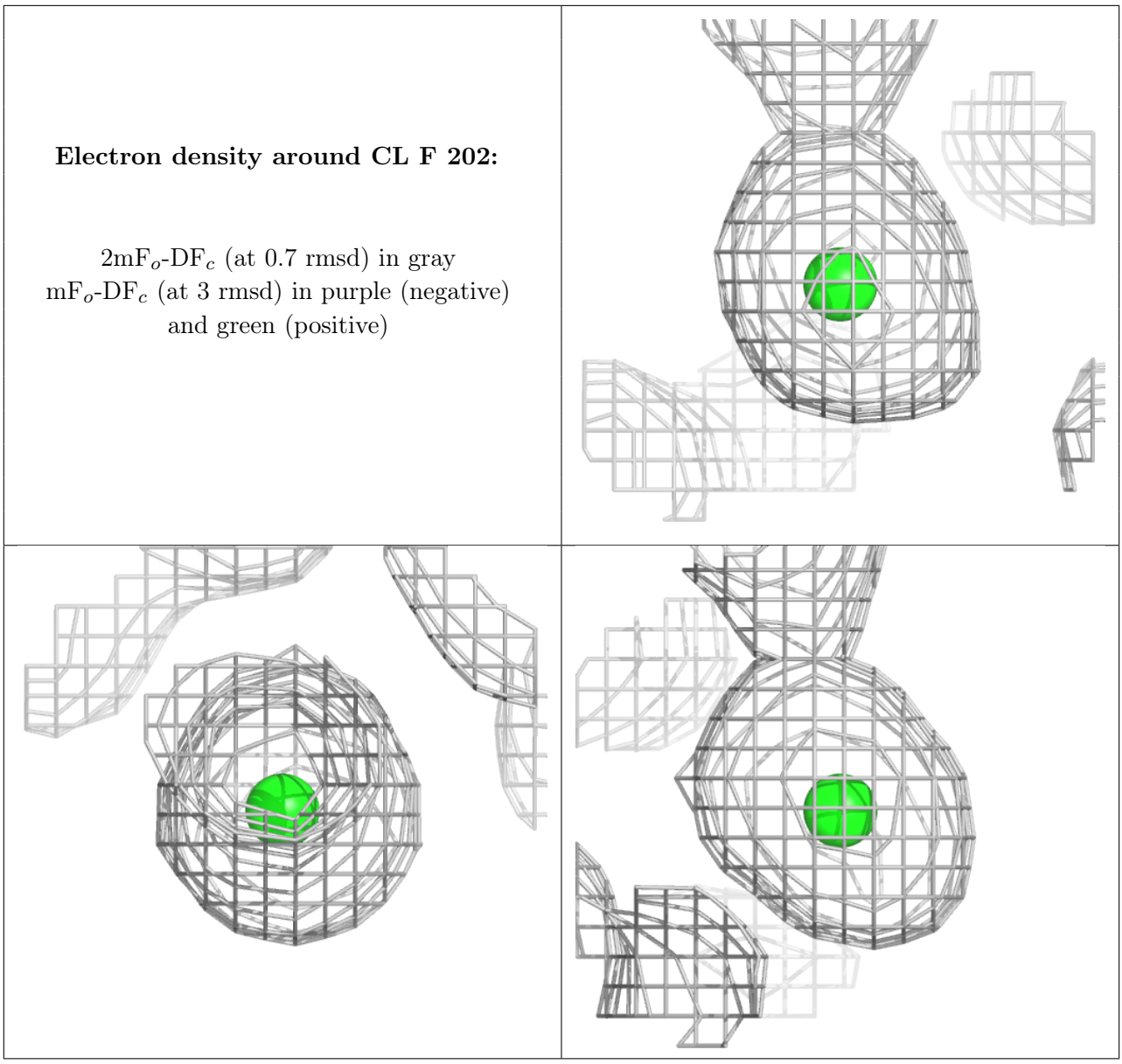
Electron density around CL G 303:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



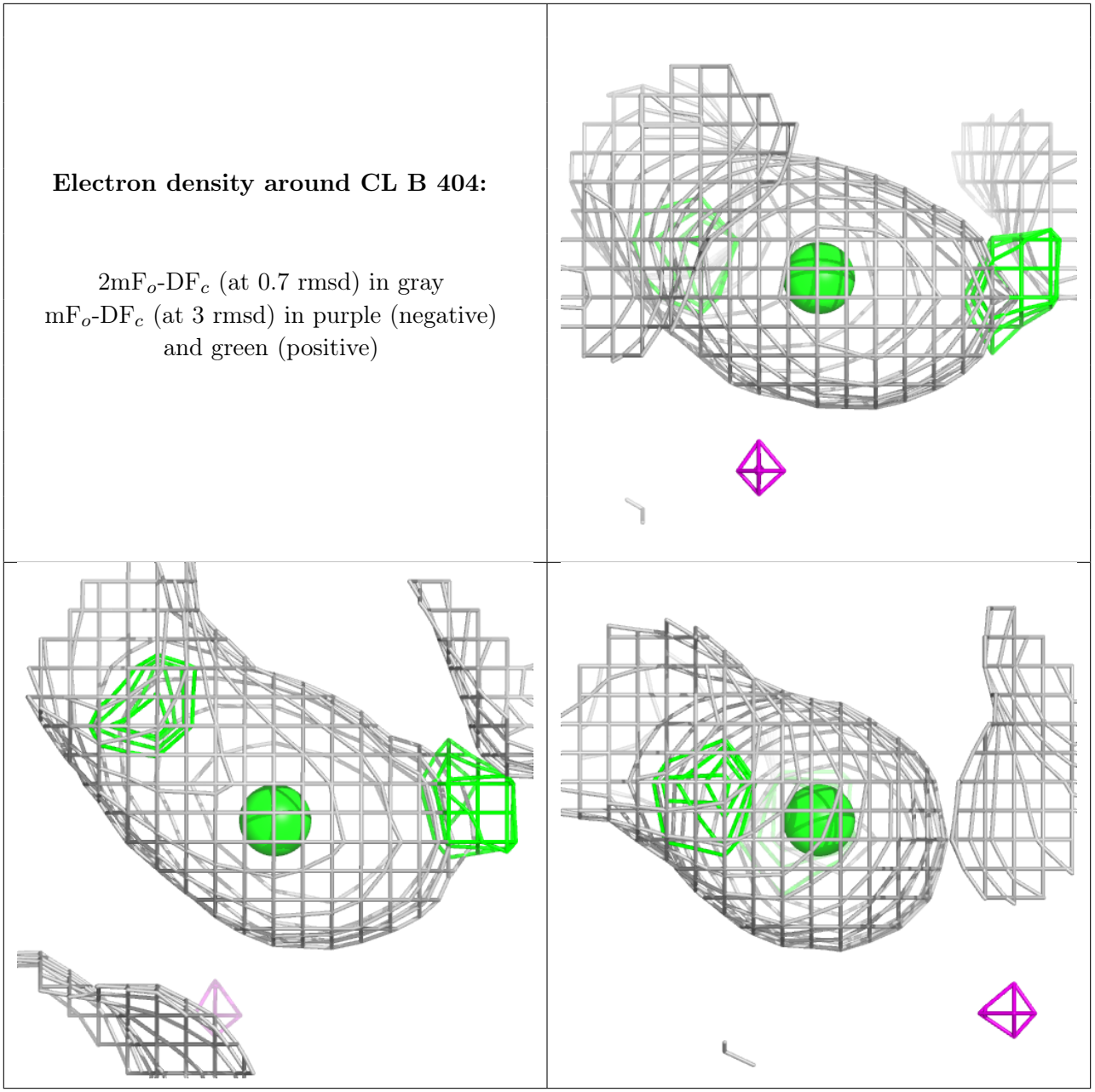
Electron density around CL F 202:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



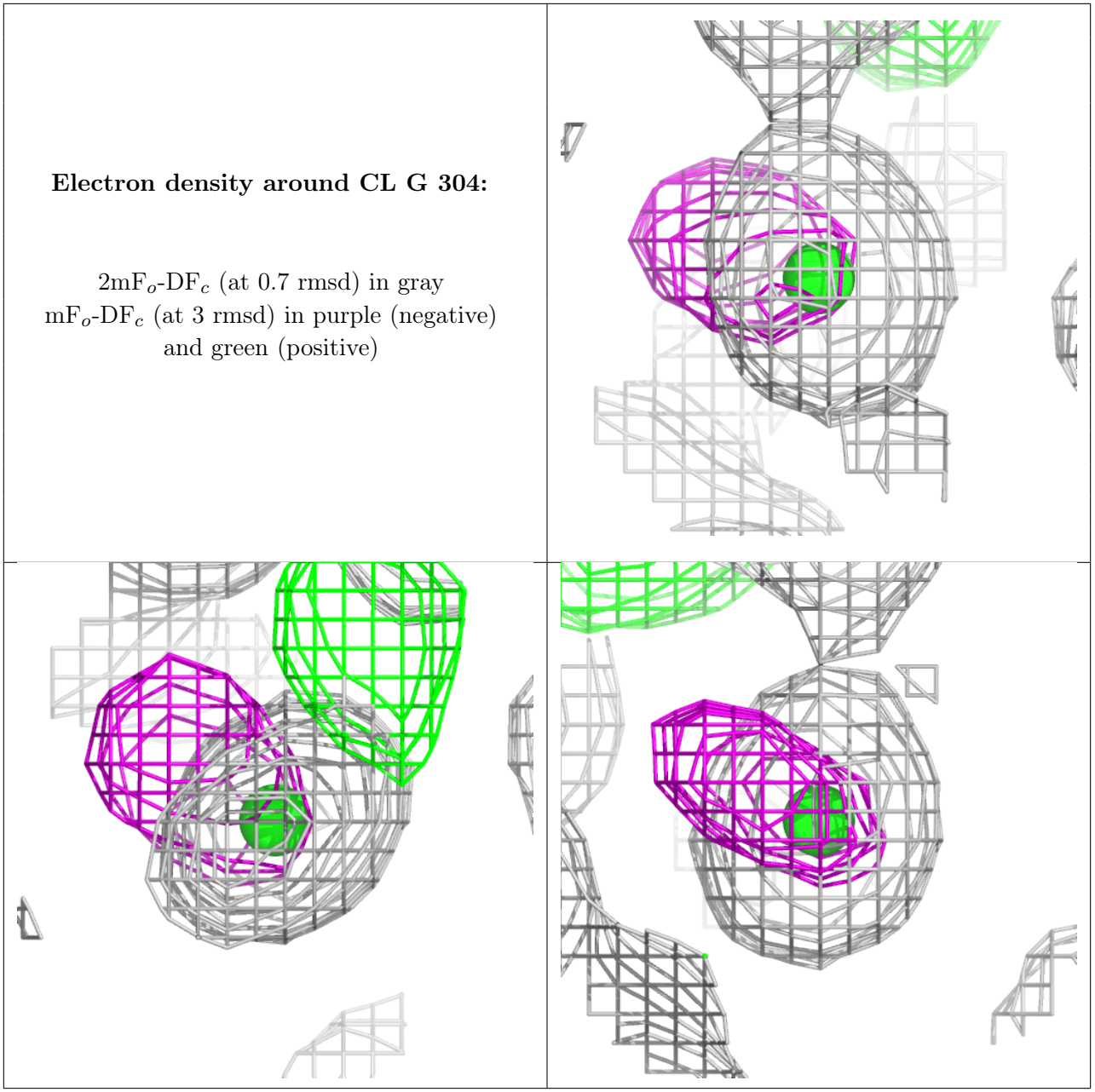
Electron density around CL B 404:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



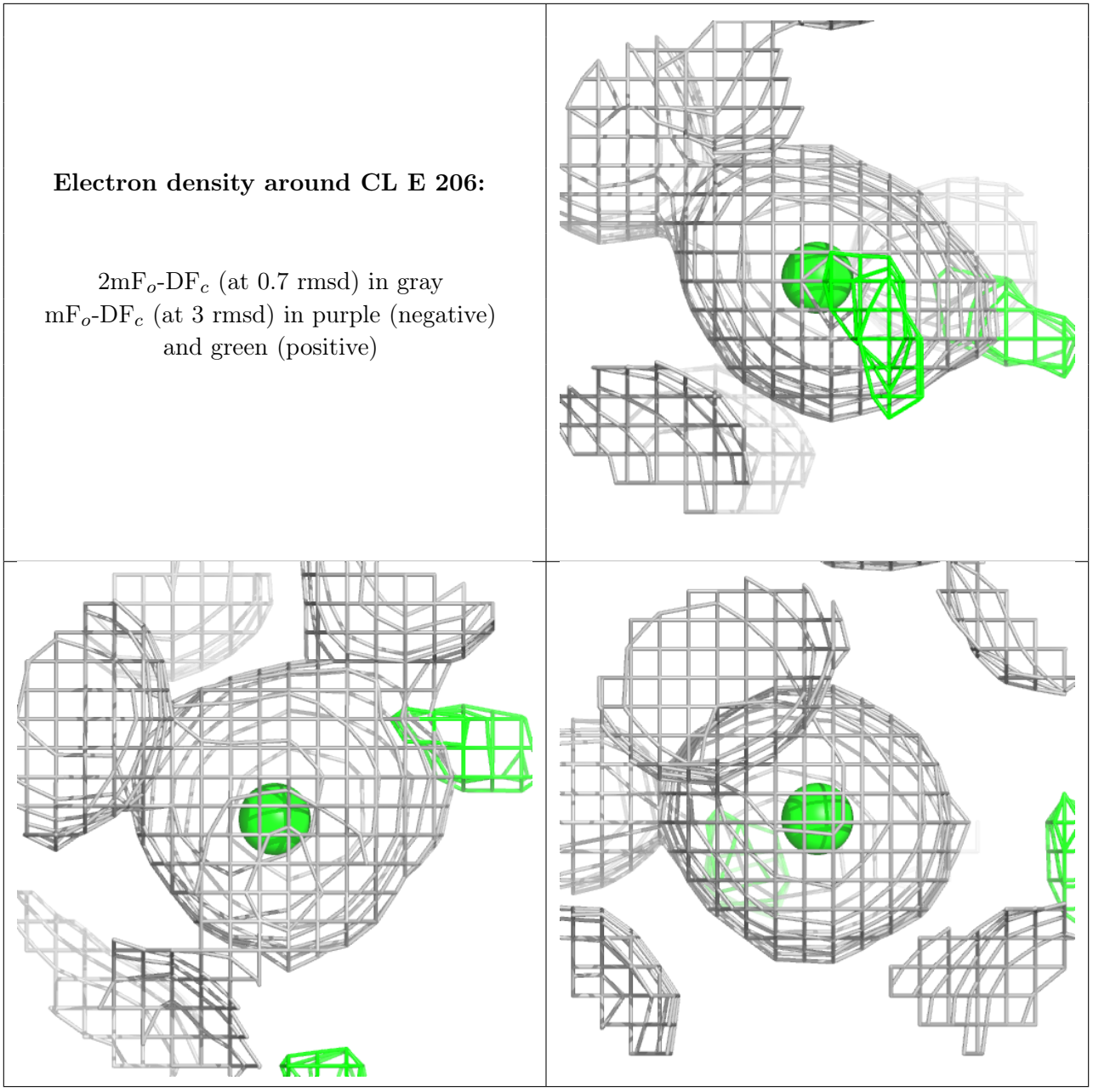
Electron density around CL G 304:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



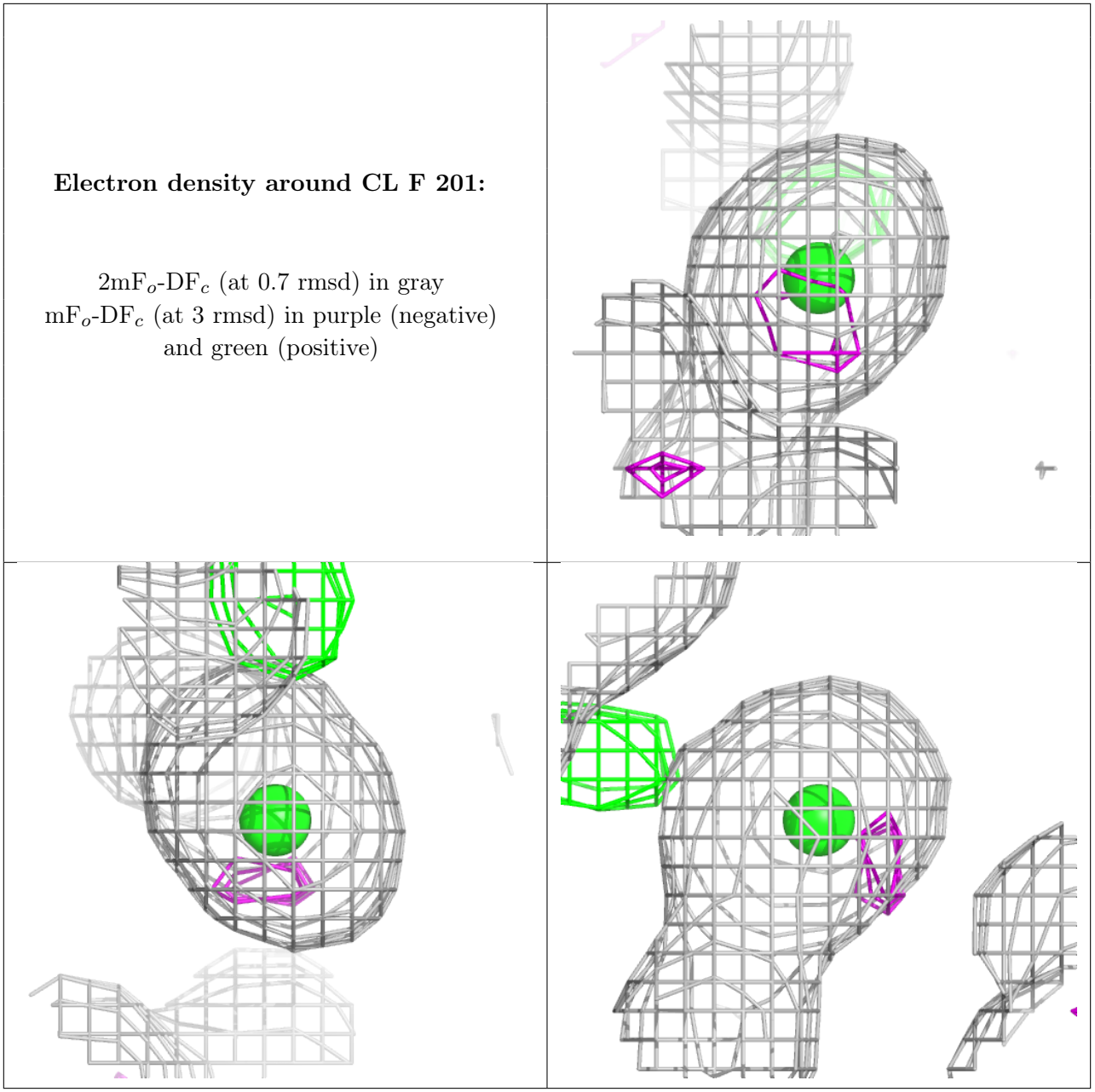
Electron density around CL E 206:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



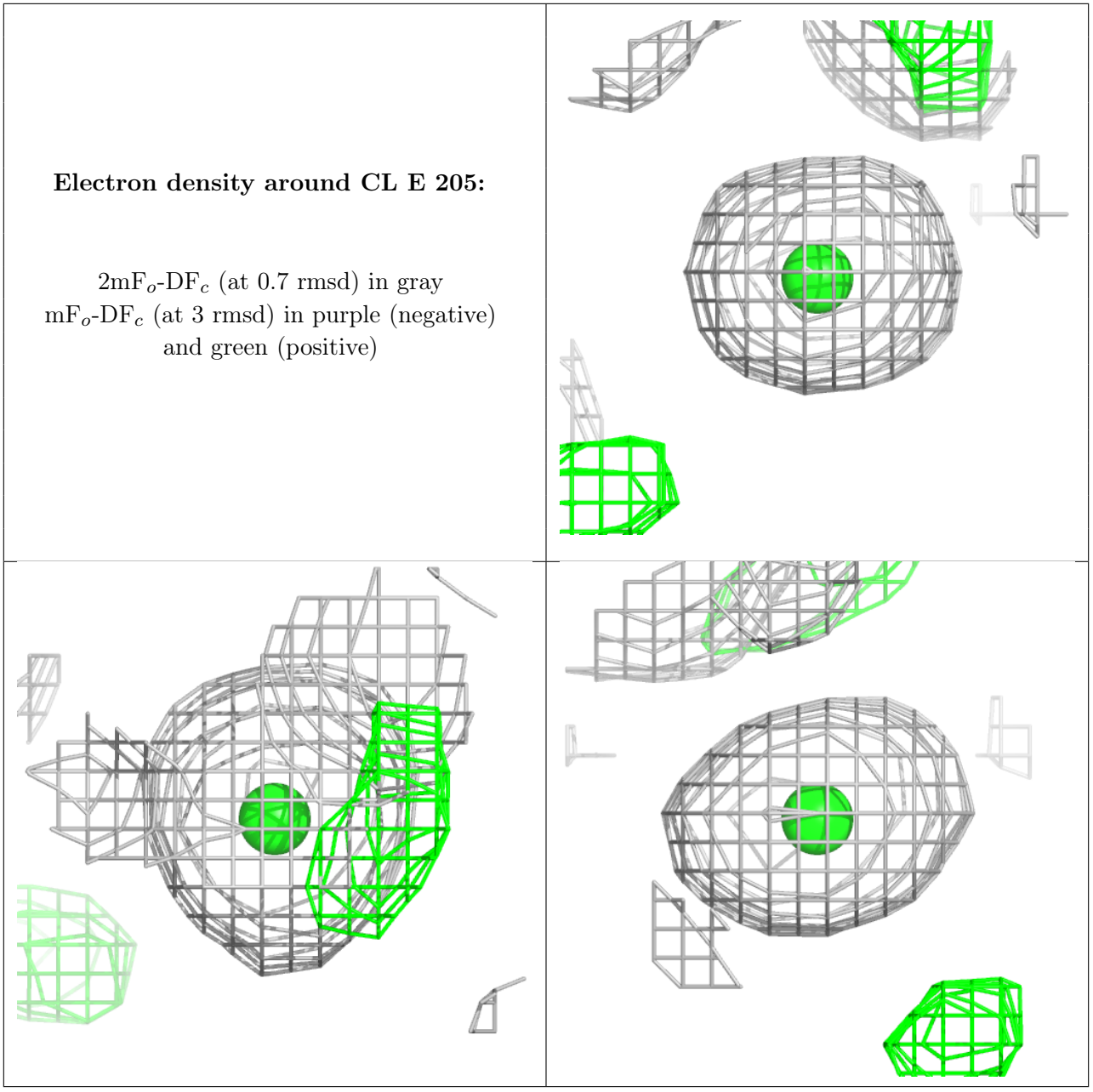
Electron density around CL F 201:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



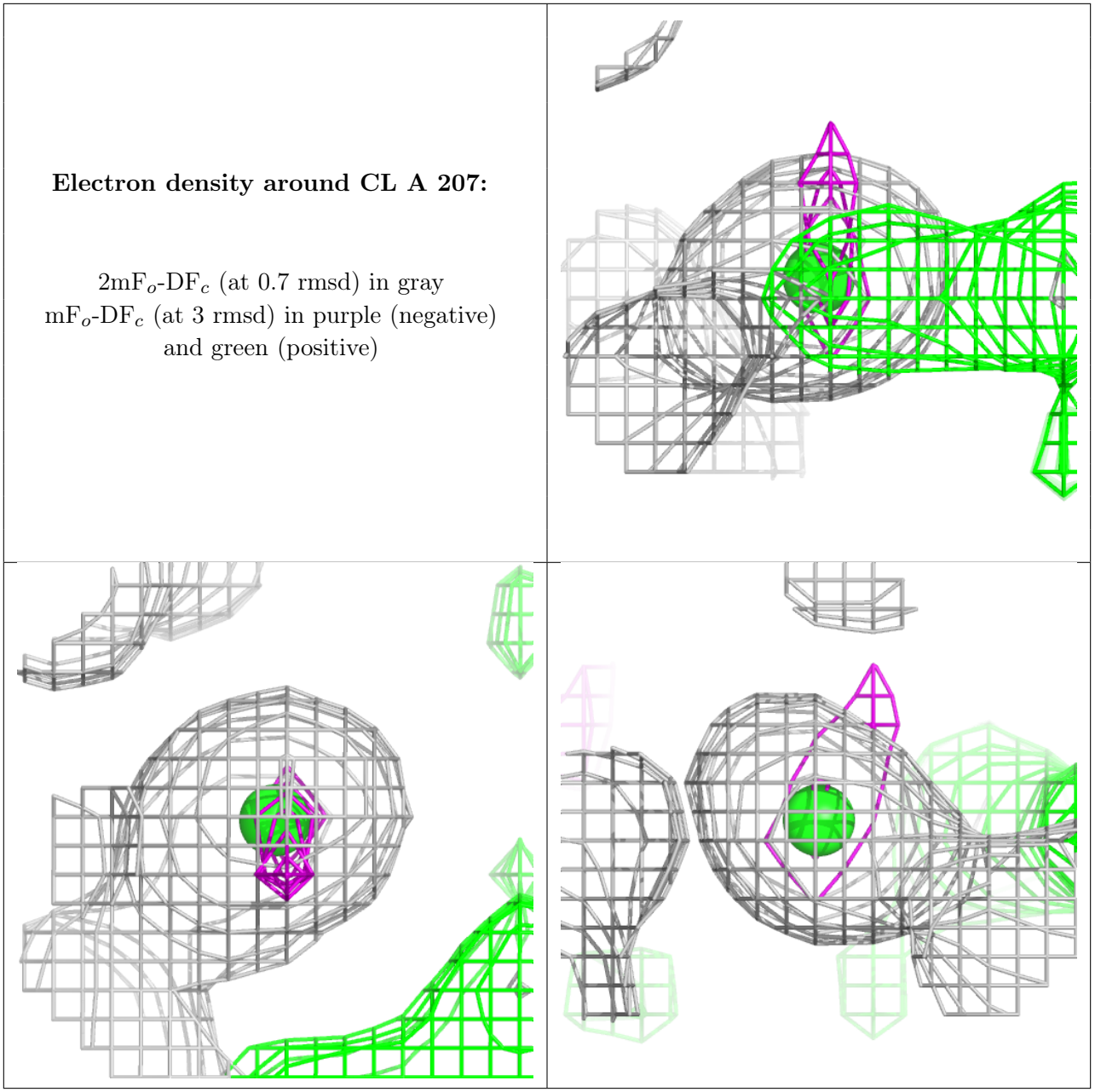
Electron density around CL E 205:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



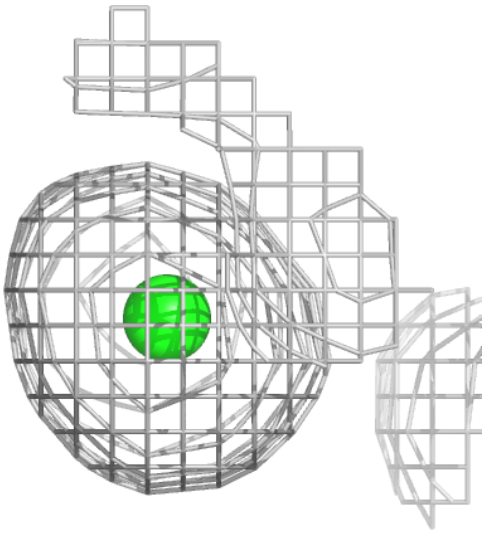
Electron density around CL A 207:

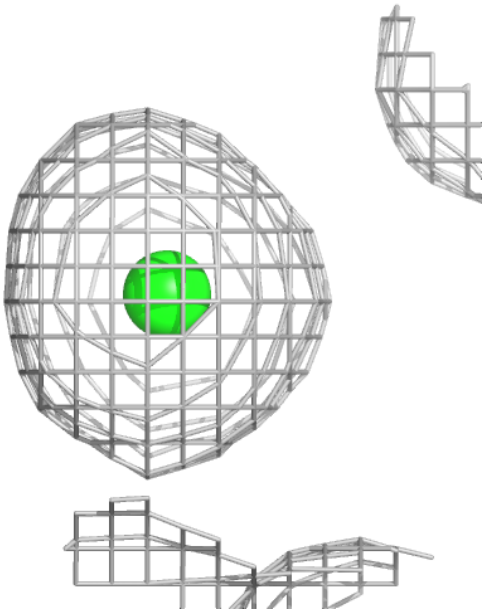
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

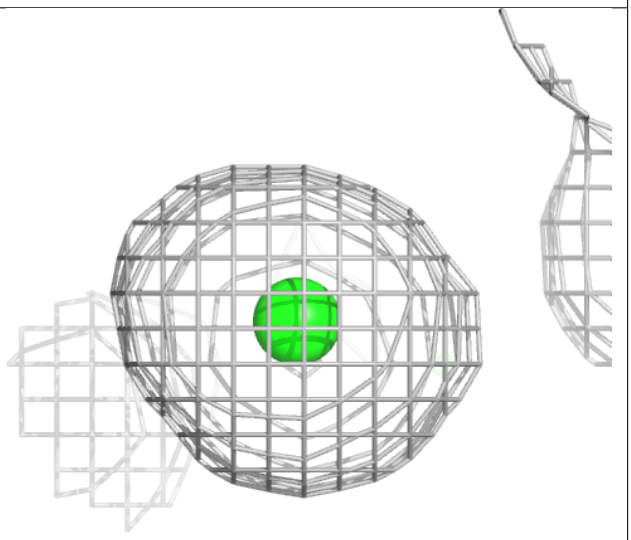


Electron density around CL A 208:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

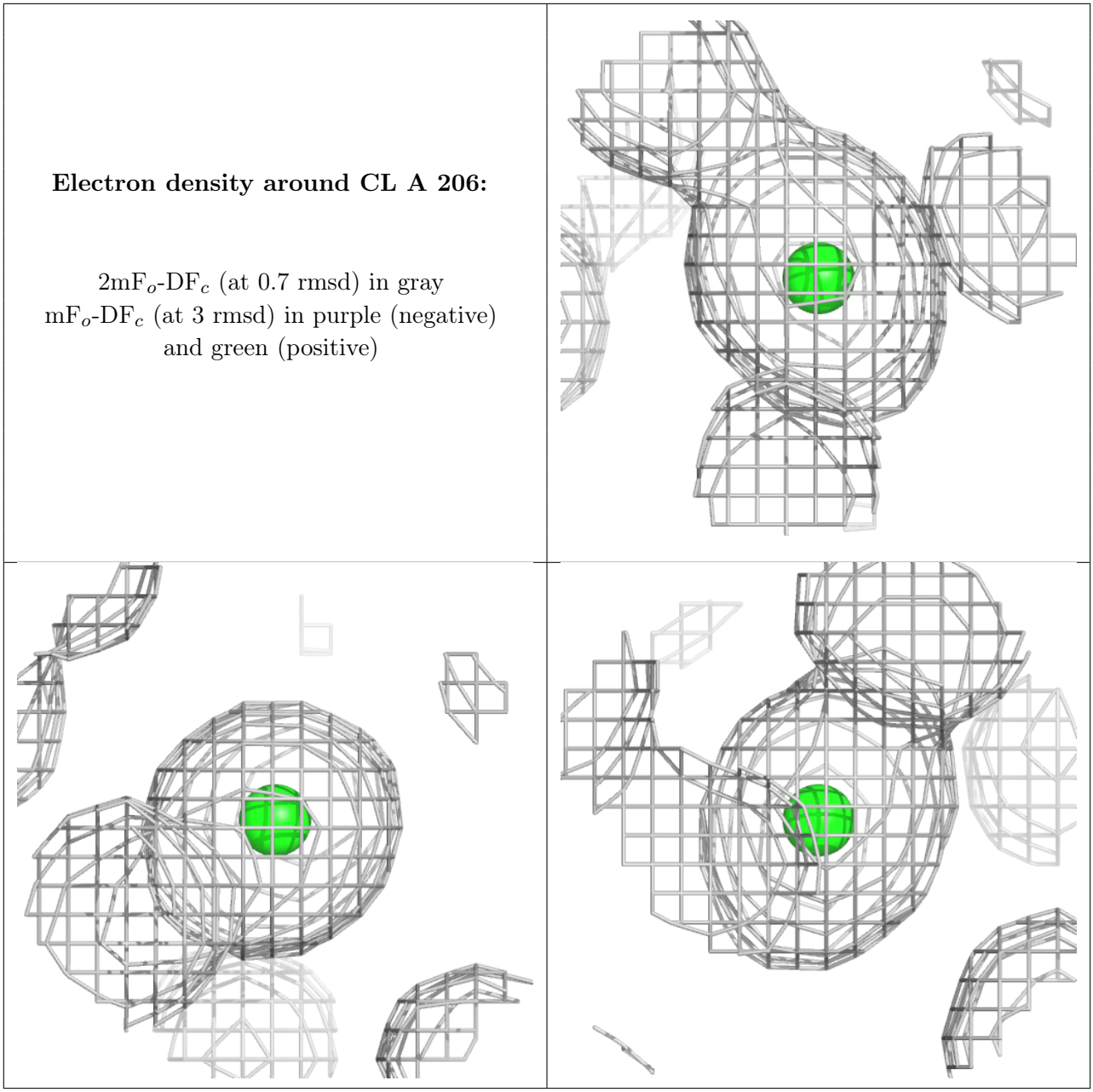






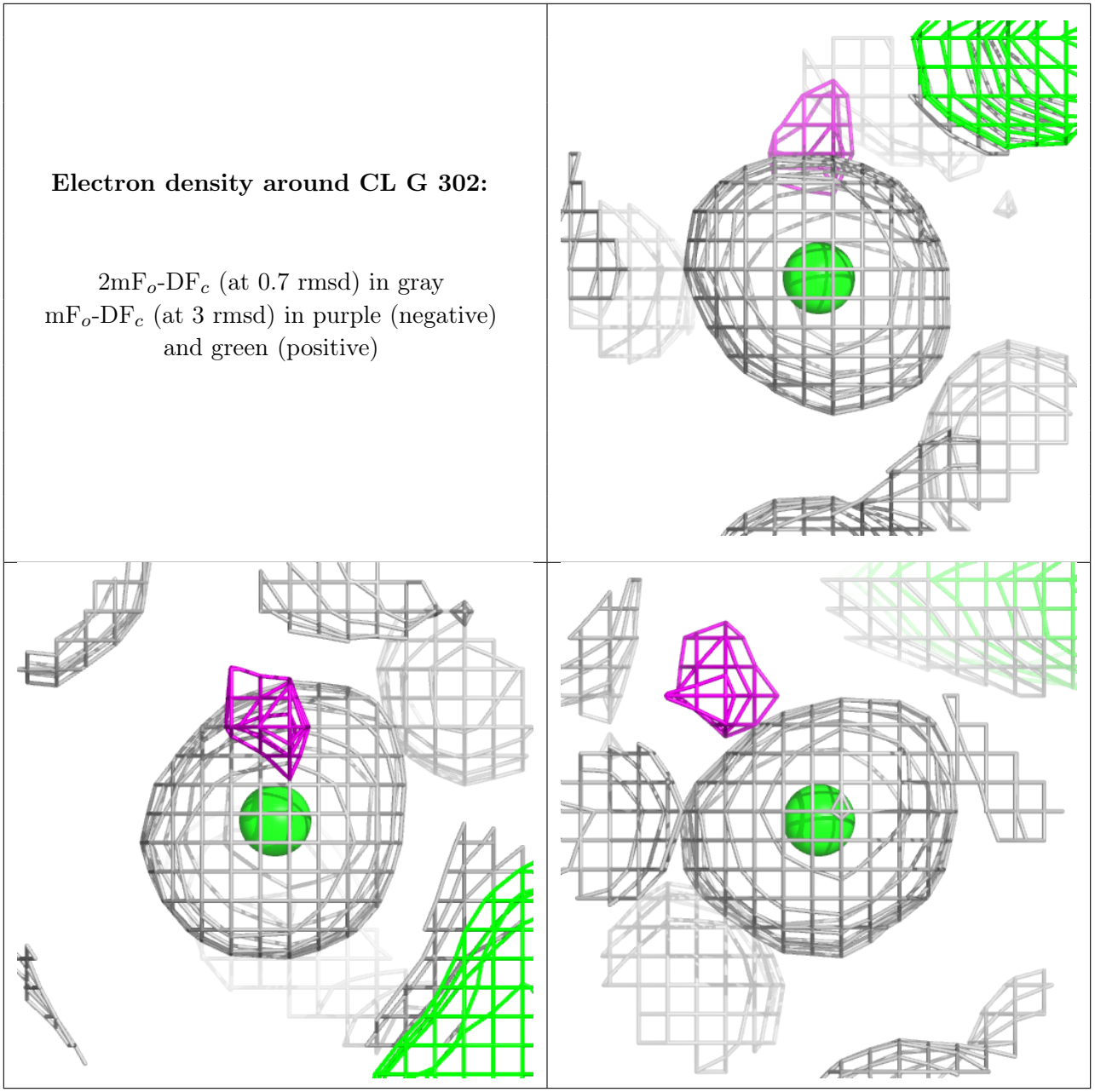
Electron density around CL A 206:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



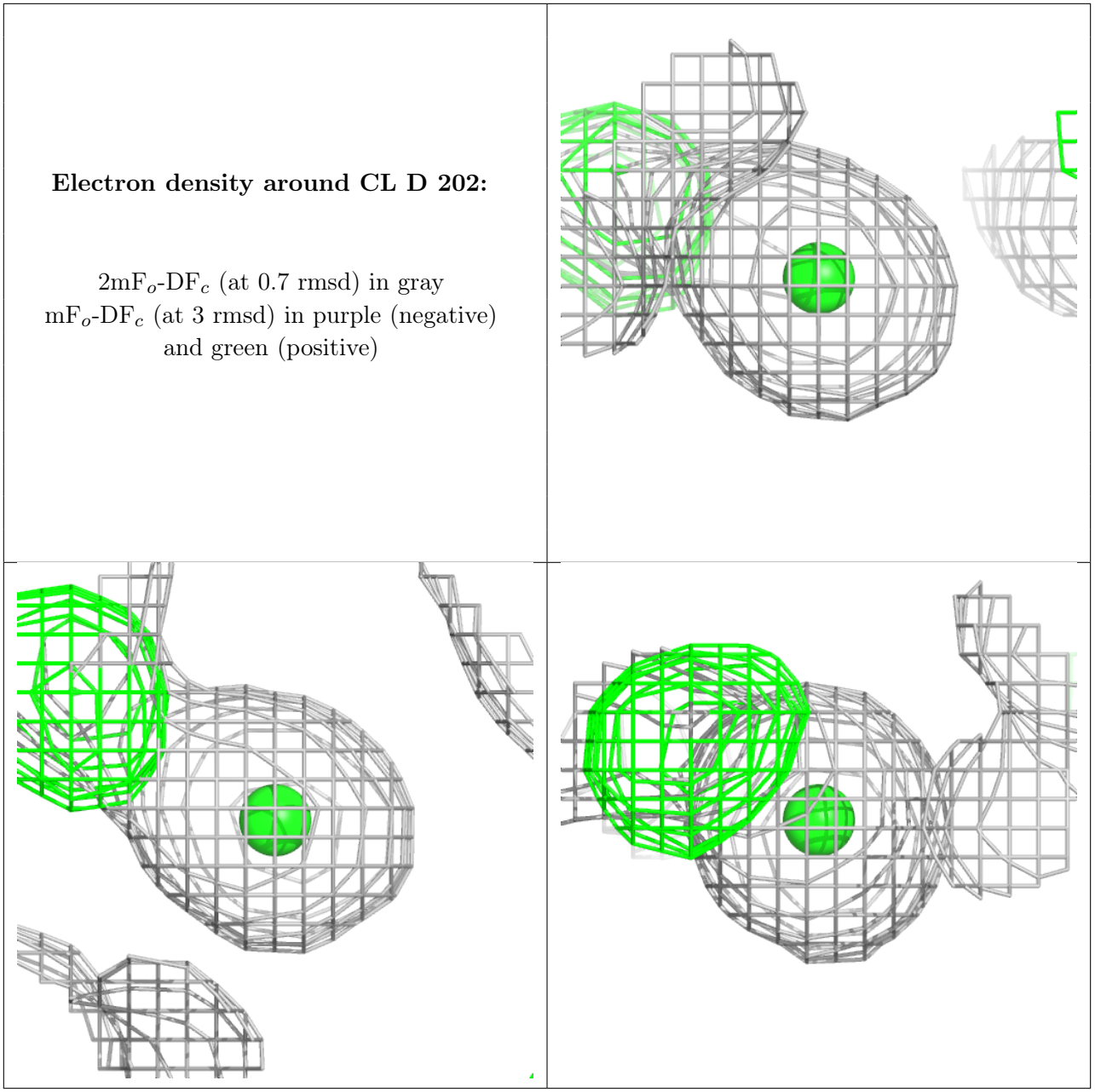
Electron density around CL G 302:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



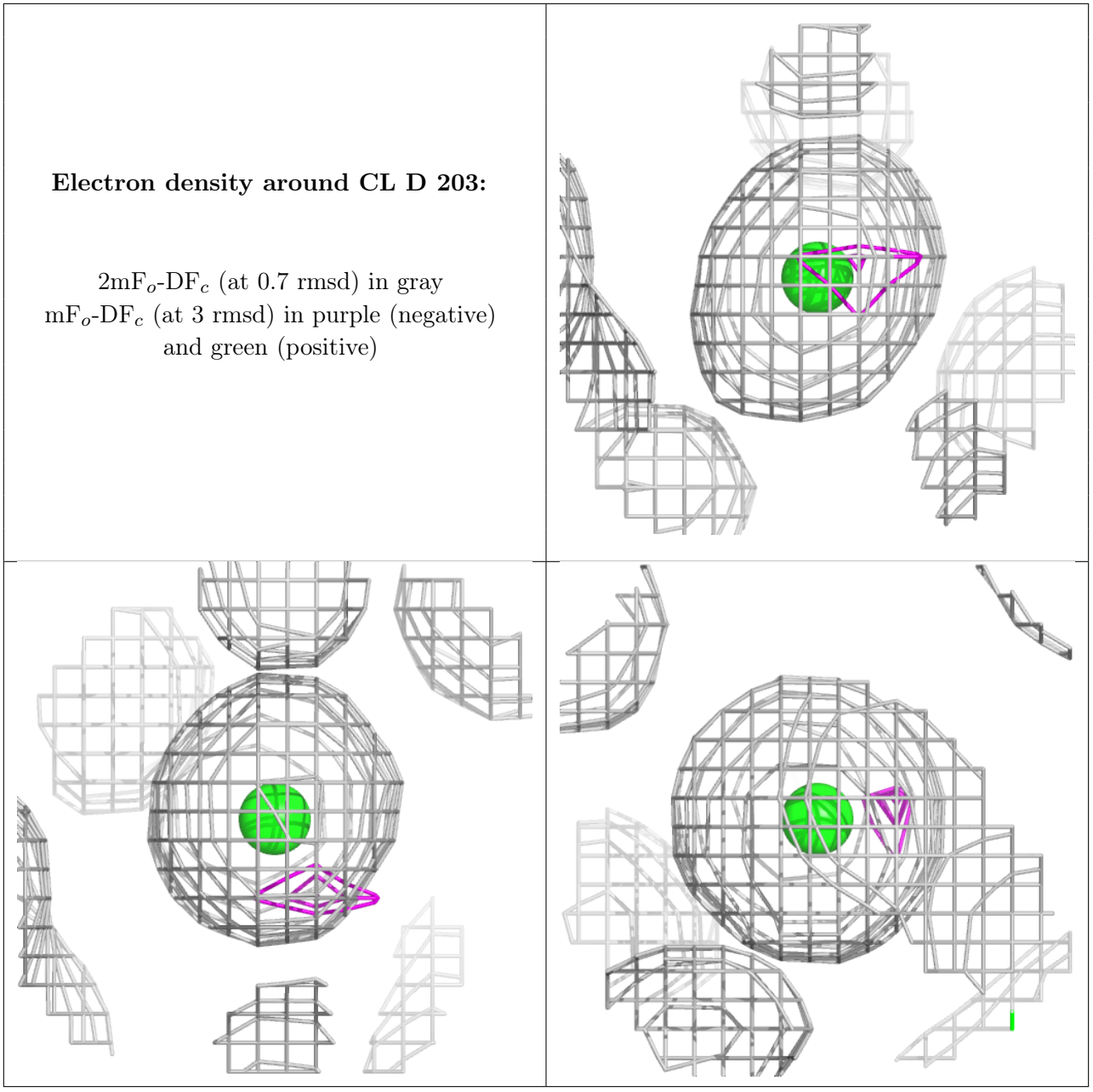
Electron density around CL D 202:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



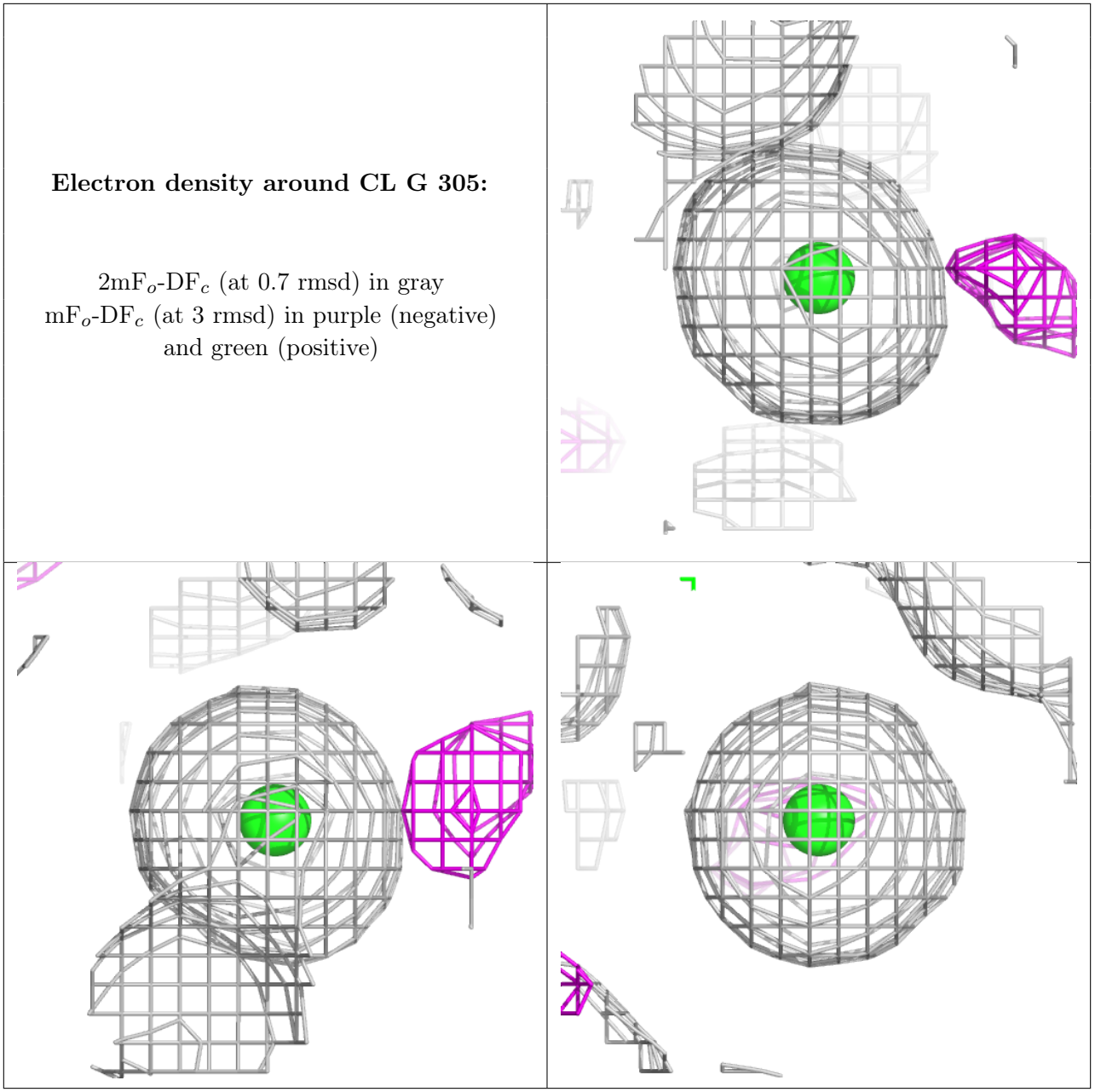
Electron density around CL D 203:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



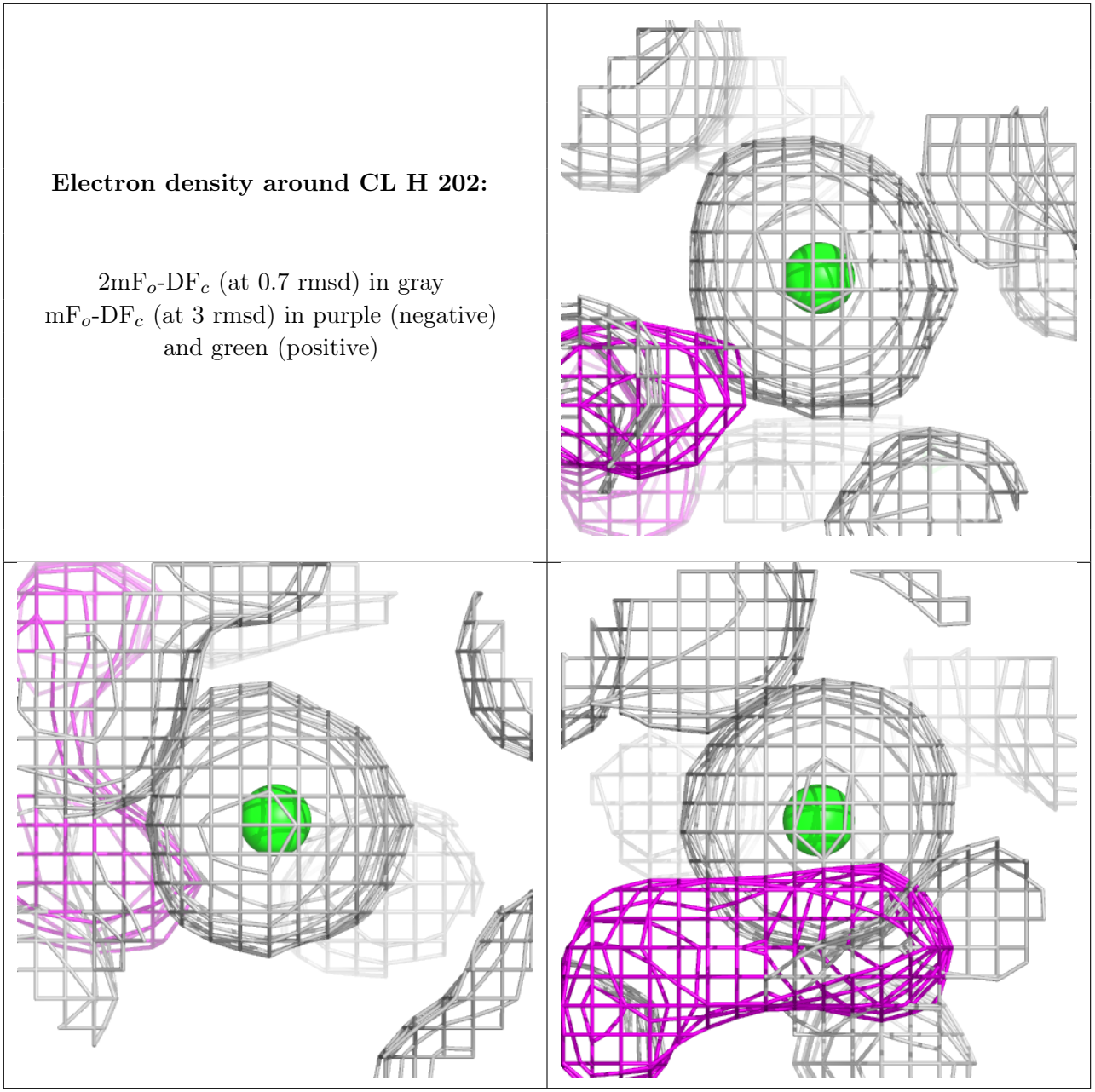
Electron density around CL G 305:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



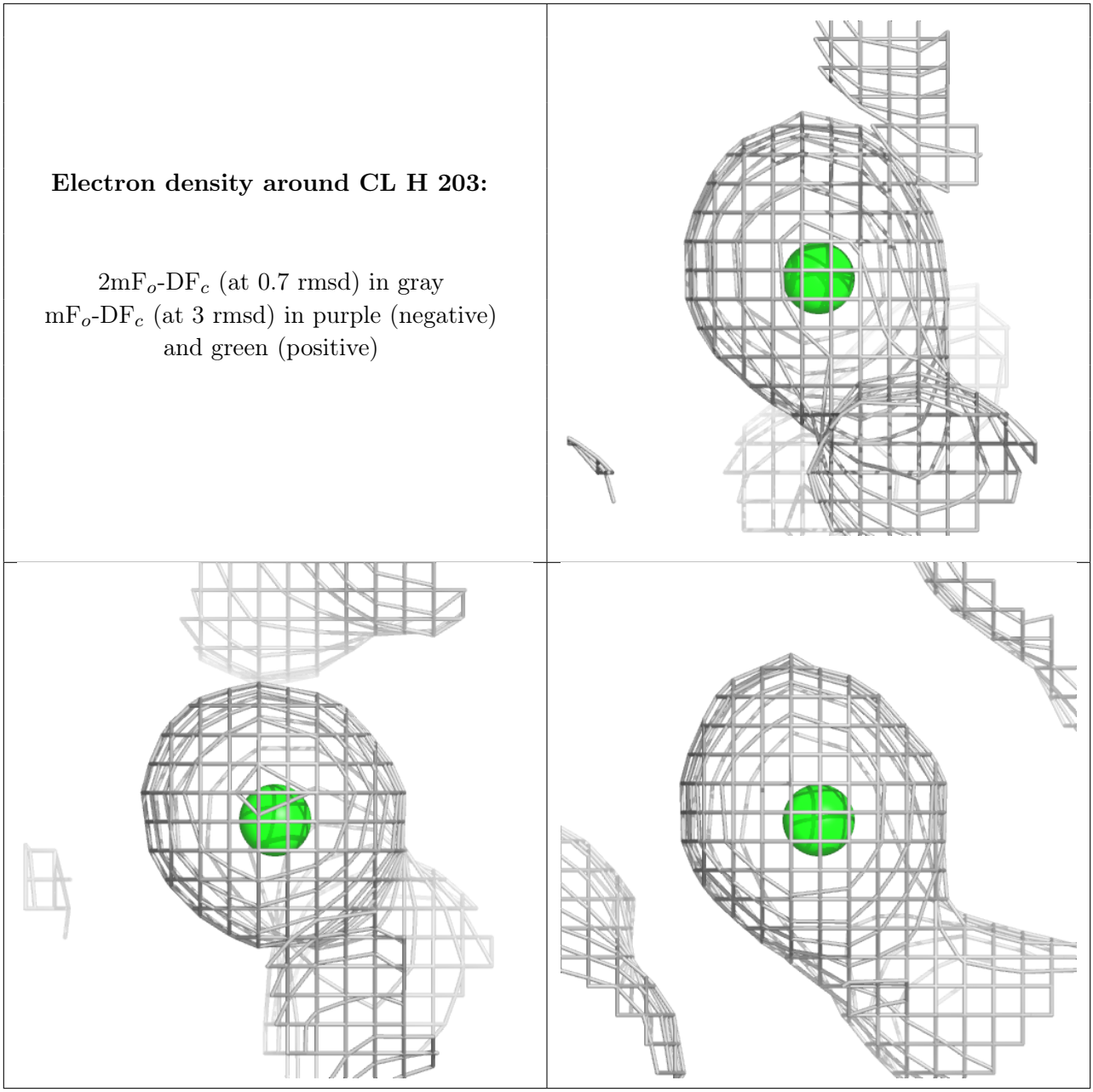
Electron density around CL H 202:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



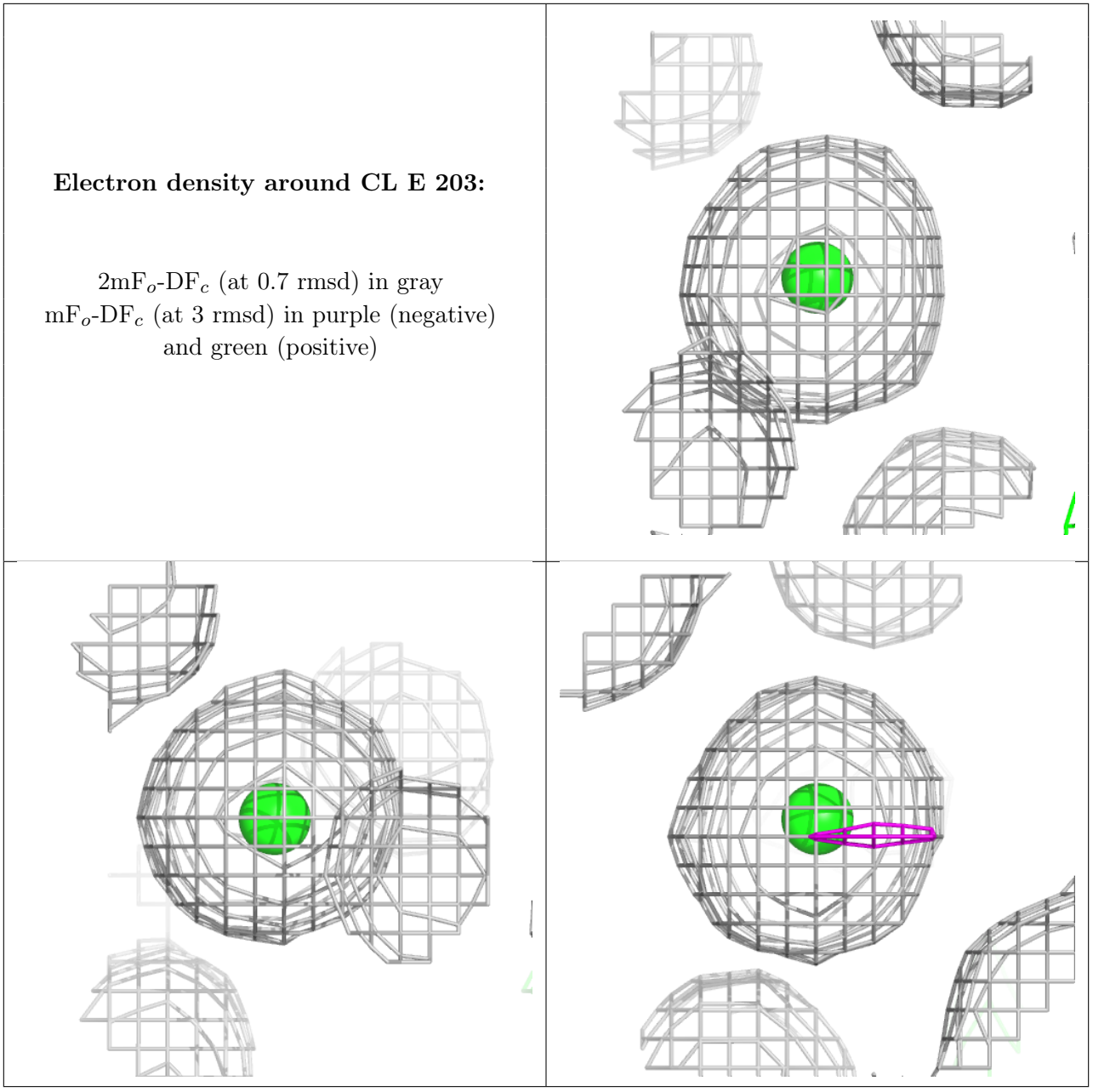
Electron density around CL H 203:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



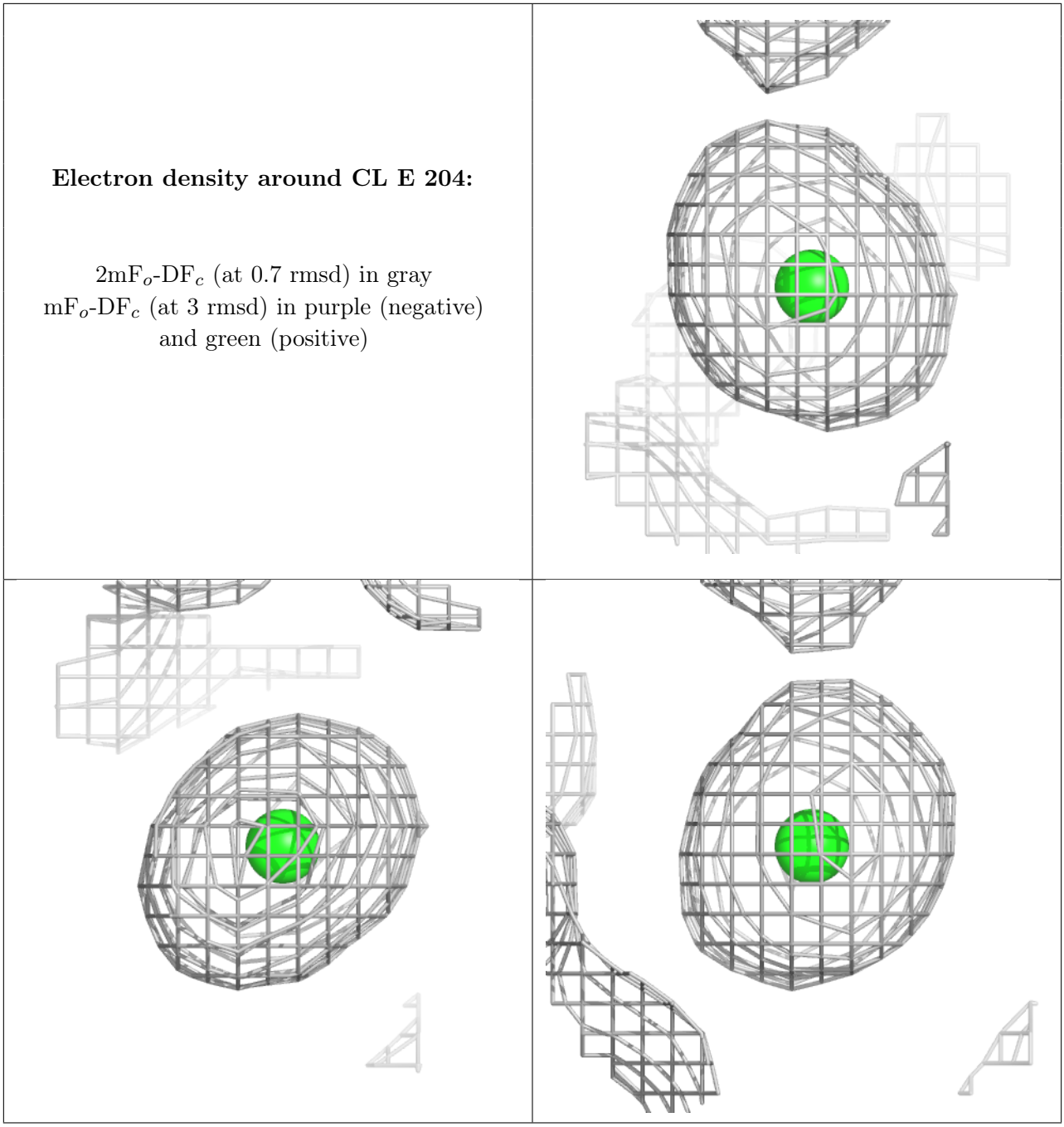
Electron density around CL E 203:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



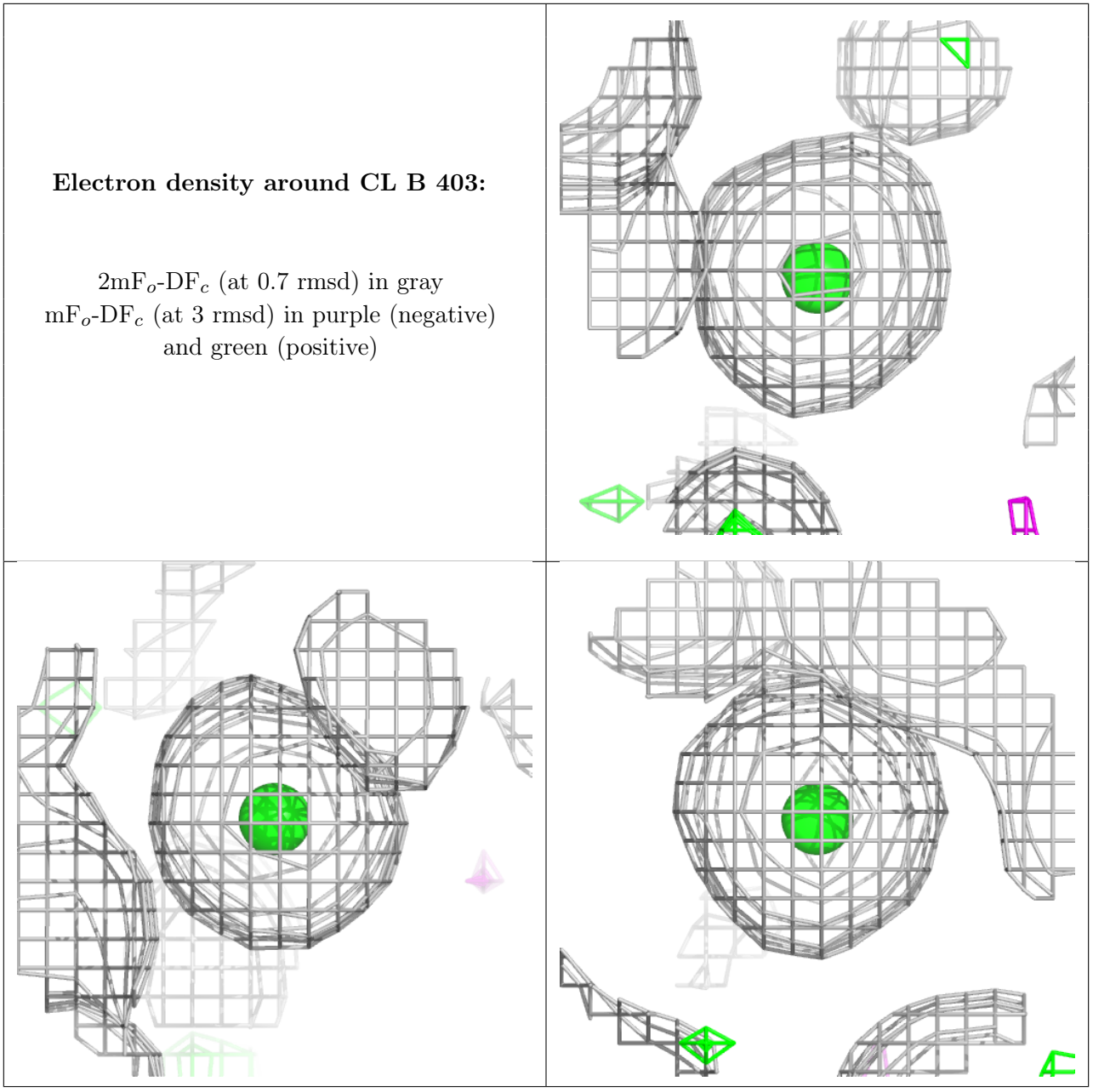
Electron density around CL E 204:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



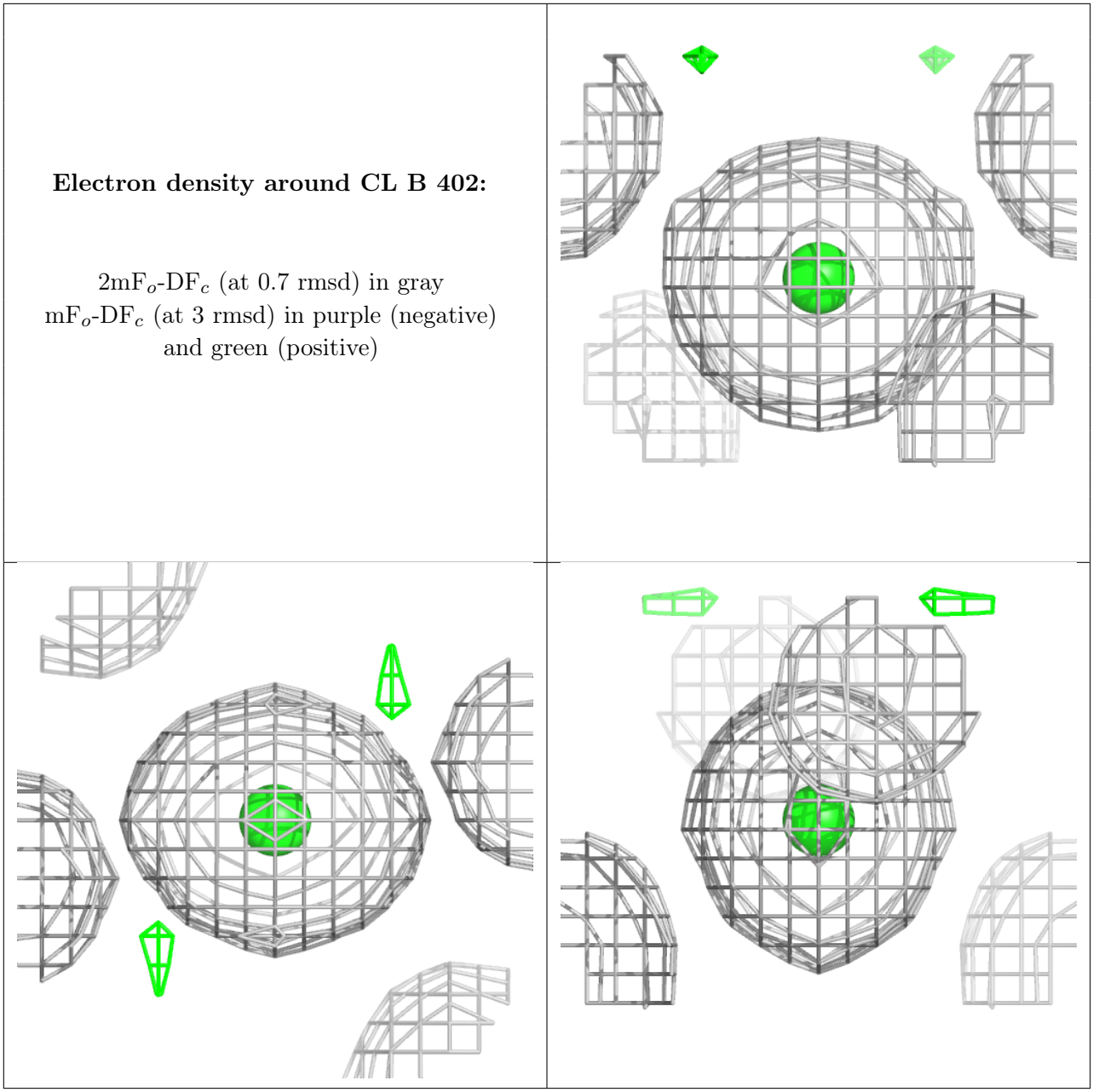
Electron density around CL B 403:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



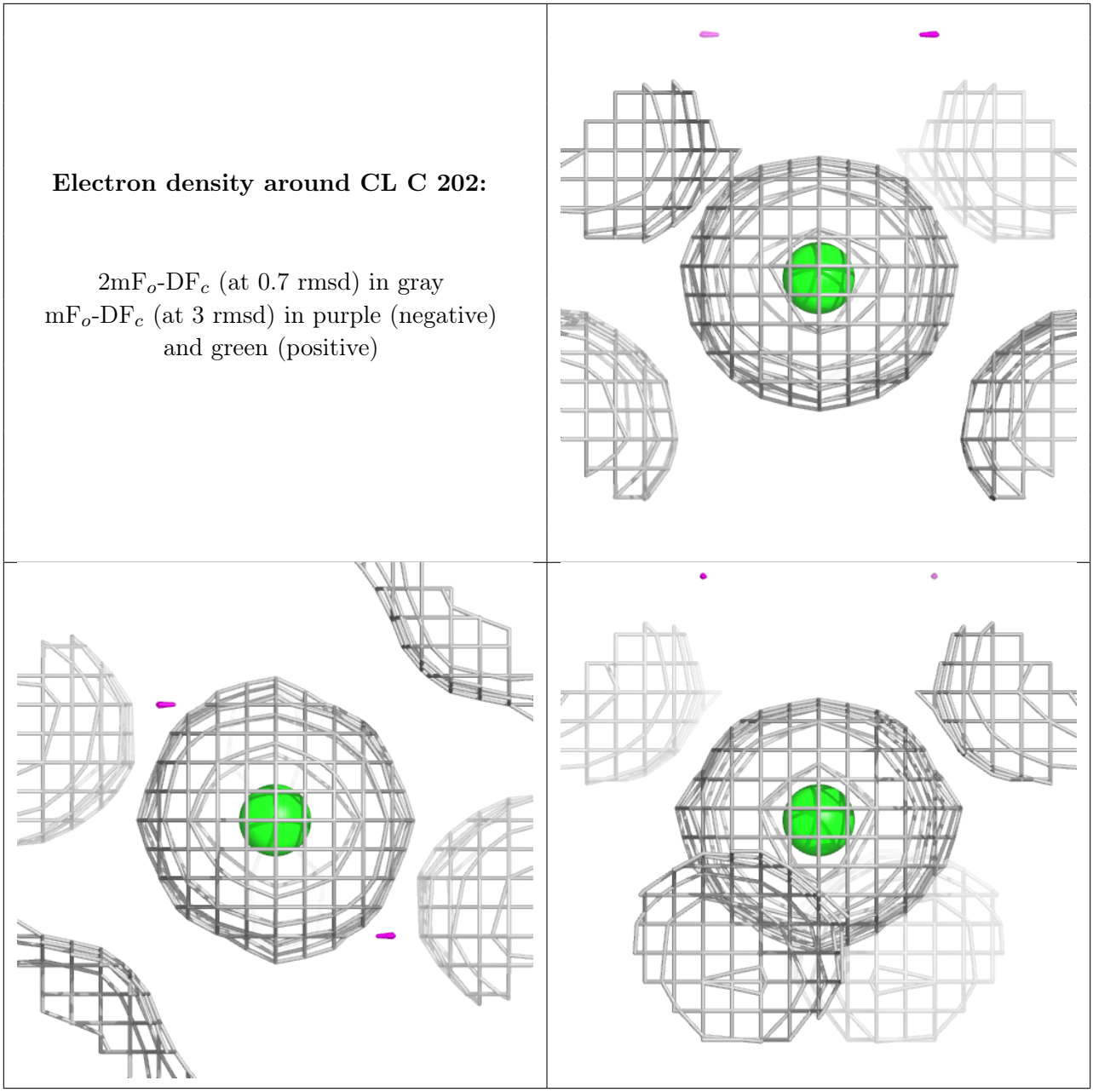
Electron density around CL B 402:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



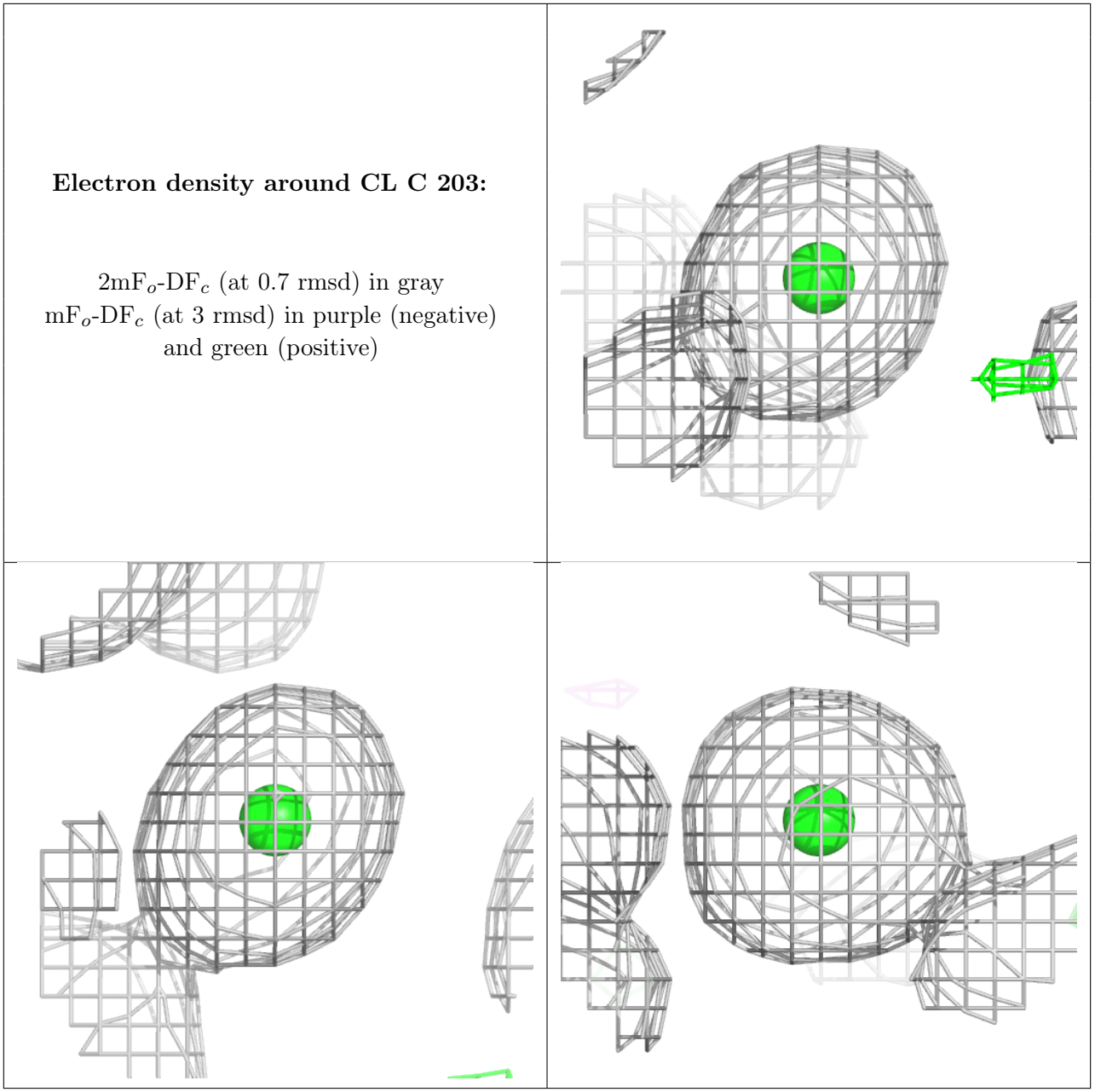
Electron density around CL C 202:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



Electron density around CL C 203:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



6.5 Other polymers (i)

There are no such residues in this entry.