wwPDB X-ray Structure Validation Summary Report (i)

Mar 13, 2023 – 01:08 pm GMT

PDB ID	:	8CDB
Title	:	Proulilysin E229A structure
Authors	:	Rodriguez-Banqueri, A.; Eckhard, U.; Gomis-Ruth, F.X.
Deposited on	:	2023-01-30
Resolution	:	4.50 Å(reported)

This is a wwPDB X-ray Structure Validation Summary 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 (1)) were used in the production of this report:

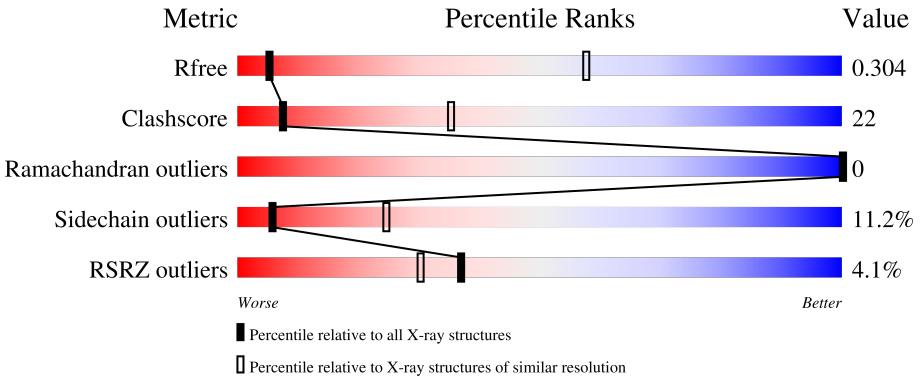
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.32.1
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.32.1

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 4.50 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	1055 (5.20-3.80)
Clashscore	141614	1123 (5.20-3.80)
Ramachandran outliers	138981	1069 (5.20-3.80)
Sidechain outliers	138945	1050 (5.20-3.80)
RSRZ outliers	127900	1101 (5.30-3.70)

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	360	2% 43% 38% • 15%
1	B	360	2% 44% 38% • 15%
1	C	360	4% 44% 38% • 15%
1	D	360	3% 44% 37% • 15%
1	E	360	5% 46% 36% • 15%

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Mol	Chain	Length	Quality of chain
1	F	360	4% 43% 38% 15%
1	G	360	4% 44% 37% 15%
1	H	360	3% 44% 38% 15%
1	I	360	5% 45% 36% 15%
1	J	360	2% 45% 36% 15%
1	K	360	6% 45% 37% 15%
1	L	360	2% 46% 36% 15%
1	M	360	6% 45% 36% 15%
1	N	360	2% 44% 37% 15%

2 Entry composition (i)

There are 3 unique types of molecules in this entry. The entry contains 33614 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 Ulilysin.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	306	Total	C	N	O	S	0	0	0
			2399	1502	419	464	14			
1	B	306	Total	C	N	O	S	0	0	0
			2399	1502	419	464	14			
1	C	306	Total	C	N	O	S	0	0	0
			2399	1502	419	464	14			
1	D	306	Total	C	N	O	S	0	0	0
			2399	1502	419	464	14			
1	E	306	Total	C	N	O	S	0	0	0
			2399	1502	419	464	14			
1	F	306	Total	C	N	O	S	0	0	0
			2399	1502	419	464	14			
1	G	306	Total	C	N	O	S	0	0	0
			2399	1502	419	464	14			
1	H	306	Total	C	N	O	S	0	0	0
			2399	1502	419	464	14			
1	I	306	Total	C	N	O	S	0	0	0
			2399	1502	419	464	14			
1	J	306	Total	C	N	O	S	0	0	0
			2399	1502	419	464	14			
1	K	306	Total	C	N	O	S	0	0	0
			2399	1502	419	464	14			
1	L	306	Total	C	N	O	S	0	0	0
			2399	1502	419	464	14			
1	M	306	Total	C	N	O	S	0	0	0
			2399	1502	419	464	14			
1	N	306	Total	C	N	O	S	0	0	0
			2399	1502	419	464	14			

There are 266 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-17	GLY	-	expression tag	UNP Q8TL28

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Chain	Residue	Modelled	Actual	Comment	Reference
A	-16	SER	-	expression tag	UNP Q8TL28
A	-15	SER	-	expression tag	UNP Q8TL28
A	-14	HIS	-	expression tag	UNP Q8TL28
A	-13	HIS	-	expression tag	UNP Q8TL28
A	-12	HIS	-	expression tag	UNP Q8TL28
A	-11	HIS	-	expression tag	UNP Q8TL28
A	-10	HIS	-	expression tag	UNP Q8TL28
A	-9	HIS	-	expression tag	UNP Q8TL28
A	-8	SER	-	expression tag	UNP Q8TL28
A	-7	SER	-	expression tag	UNP Q8TL28
A	-6	GLY	-	expression tag	UNP Q8TL28
A	-5	LEU	-	expression tag	UNP Q8TL28
A	-4	VAL	-	expression tag	UNP Q8TL28
A	-3	PRO	-	expression tag	UNP Q8TL28
A	-2	ARG	-	expression tag	UNP Q8TL28
A	-1	GLY	-	expression tag	UNP Q8TL28
A	0	SER	-	expression tag	UNP Q8TL28
A	229	ALA	GLU	variant	UNP Q8TL28
B	-17	GLY	-	expression tag	UNP Q8TL28
B	-16	SER	-	expression tag	UNP Q8TL28
B	-15	SER	-	expression tag	UNP Q8TL28
B	-14	HIS	-	expression tag	UNP Q8TL28
B	-13	HIS	-	expression tag	UNP Q8TL28
B	-12	HIS	-	expression tag	UNP Q8TL28
B	-11	HIS	-	expression tag	UNP Q8TL28
B	-10	HIS	-	expression tag	UNP Q8TL28
B	-9	HIS	-	expression tag	UNP Q8TL28
B	-8	SER	-	expression tag	UNP Q8TL28
B	-7	SER	-	expression tag	UNP Q8TL28
B	-6	GLY	-	expression tag	UNP Q8TL28
B	-5	LEU	-	expression tag	UNP Q8TL28
B	-4	VAL	-	expression tag	UNP Q8TL28
B	-3	PRO	-	expression tag	UNP Q8TL28
B	-2	ARG	-	expression tag	UNP Q8TL28
B	-1	GLY	-	expression tag	UNP Q8TL28
B	0	SER	-	expression tag	UNP Q8TL28
B	229	ALA	GLU	variant	UNP Q8TL28
C	-17	GLY	-	expression tag	UNP Q8TL28
C	-16	SER	-	expression tag	UNP Q8TL28
C	-15	SER	-	expression tag	UNP Q8TL28
C	-14	HIS	-	expression tag	UNP Q8TL28
C	-13	HIS	-	expression tag	UNP Q8TL28

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Chain	Residue	Modelled	Actual	Comment	Reference
C	-12	HIS	-	expression tag	UNP Q8TL28
C	-11	HIS	-	expression tag	UNP Q8TL28
C	-10	HIS	-	expression tag	UNP Q8TL28
C	-9	HIS	-	expression tag	UNP Q8TL28
C	-8	SER	-	expression tag	UNP Q8TL28
C	-7	SER	-	expression tag	UNP Q8TL28
C	-6	GLY	-	expression tag	UNP Q8TL28
C	-5	LEU	-	expression tag	UNP Q8TL28
C	-4	VAL	-	expression tag	UNP Q8TL28
C	-3	PRO	-	expression tag	UNP Q8TL28
C	-2	ARG	-	expression tag	UNP Q8TL28
C	-1	GLY	-	expression tag	UNP Q8TL28
C	0	SER	-	expression tag	UNP Q8TL28
C	229	ALA	GLU	variant	UNP Q8TL28
D	-17	GLY	-	expression tag	UNP Q8TL28
D	-16	SER	-	expression tag	UNP Q8TL28
D	-15	SER	-	expression tag	UNP Q8TL28
D	-14	HIS	-	expression tag	UNP Q8TL28
D	-13	HIS	-	expression tag	UNP Q8TL28
D	-12	HIS	-	expression tag	UNP Q8TL28
D	-11	HIS	-	expression tag	UNP Q8TL28
D	-10	HIS	-	expression tag	UNP Q8TL28
D	-9	HIS	-	expression tag	UNP Q8TL28
D	-8	SER	-	expression tag	UNP Q8TL28
D	-7	SER	-	expression tag	UNP Q8TL28
D	-6	GLY	-	expression tag	UNP Q8TL28
D	-5	LEU	-	expression tag	UNP Q8TL28
D	-4	VAL	-	expression tag	UNP Q8TL28
D	-3	PRO	-	expression tag	UNP Q8TL28
D	-2	ARG	-	expression tag	UNP Q8TL28
D	-1	GLY	-	expression tag	UNP Q8TL28
D	0	SER	-	expression tag	UNP Q8TL28
D	229	ALA	GLU	variant	UNP Q8TL28
E	-17	GLY	-	expression tag	UNP Q8TL28
E	-16	SER	-	expression tag	UNP Q8TL28
E	-15	SER	-	expression tag	UNP Q8TL28
E	-14	HIS	-	expression tag	UNP Q8TL28
E	-13	HIS	-	expression tag	UNP Q8TL28
E	-12	HIS	-	expression tag	UNP Q8TL28
E	-11	HIS	-	expression tag	UNP Q8TL28
E	-10	HIS	-	expression tag	UNP Q8TL28
E	-9	HIS	-	expression tag	UNP Q8TL28

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Chain	Residue	Modelled	Actual	Comment	Reference
E	-8	SER	-	expression tag	UNP Q8TL28
E	-7	SER	-	expression tag	UNP Q8TL28
E	-6	GLY	-	expression tag	UNP Q8TL28
E	-5	LEU	-	expression tag	UNP Q8TL28
E	-4	VAL	-	expression tag	UNP Q8TL28
E	-3	PRO	-	expression tag	UNP Q8TL28
E	-2	ARG	-	expression tag	UNP Q8TL28
E	-1	GLY	-	expression tag	UNP Q8TL28
E	0	SER	-	expression tag	UNP Q8TL28
E	229	ALA	GLU	variant	UNP Q8TL28
F	-17	GLY	-	expression tag	UNP Q8TL28
F	-16	SER	-	expression tag	UNP Q8TL28
F	-15	SER	-	expression tag	UNP Q8TL28
F	-14	HIS	-	expression tag	UNP Q8TL28
F	-13	HIS	-	expression tag	UNP Q8TL28
F	-12	HIS	-	expression tag	UNP Q8TL28
F	-11	HIS	-	expression tag	UNP Q8TL28
F	-10	HIS	-	expression tag	UNP Q8TL28
F	-9	HIS	-	expression tag	UNP Q8TL28
F	-8	SER	-	expression tag	UNP Q8TL28
F	-7	SER	-	expression tag	UNP Q8TL28
F	-6	GLY	-	expression tag	UNP Q8TL28
F	-5	LEU	-	expression tag	UNP Q8TL28
F	-4	VAL	-	expression tag	UNP Q8TL28
F	-3	PRO	-	expression tag	UNP Q8TL28
F	-2	ARG	-	expression tag	UNP Q8TL28
F	-1	GLY	-	expression tag	UNP Q8TL28
F	0	SER	-	expression tag	UNP Q8TL28
F	229	ALA	GLU	variant	UNP Q8TL28
G	-17	GLY	-	expression tag	UNP Q8TL28
G	-16	SER	-	expression tag	UNP Q8TL28
G	-15	SER	-	expression tag	UNP Q8TL28
G	-14	HIS	-	expression tag	UNP Q8TL28
G	-13	HIS	-	expression tag	UNP Q8TL28
G	-12	HIS	-	expression tag	UNP Q8TL28
G	-11	HIS	-	expression tag	UNP Q8TL28
G	-10	HIS	-	expression tag	UNP Q8TL28
G	-9	HIS	-	expression tag	UNP Q8TL28
G	-8	SER	-	expression tag	UNP Q8TL28
G	-7	SER	-	expression tag	UNP Q8TL28
G	-6	GLY	-	expression tag	UNP Q8TL28
G	-5	LEU	-	expression tag	UNP Q8TL28

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Chain	Residue	Modelled	Actual	Comment	Reference
G	-4	VAL	-	expression tag	UNP Q8TL28
G	-3	PRO	-	expression tag	UNP Q8TL28
G	-2	ARG	-	expression tag	UNP Q8TL28
G	-1	GLY	-	expression tag	UNP Q8TL28
G	0	SER	-	expression tag	UNP Q8TL28
G	229	ALA	GLU	variant	UNP Q8TL28
H	-17	GLY	-	expression tag	UNP Q8TL28
H	-16	SER	-	expression tag	UNP Q8TL28
H	-15	SER	-	expression tag	UNP Q8TL28
H	-14	HIS	-	expression tag	UNP Q8TL28
H	-13	HIS	-	expression tag	UNP Q8TL28
H	-12	HIS	-	expression tag	UNP Q8TL28
H	-11	HIS	-	expression tag	UNP Q8TL28
H	-10	HIS	-	expression tag	UNP Q8TL28
H	-9	HIS	-	expression tag	UNP Q8TL28
H	-8	SER	-	expression tag	UNP Q8TL28
H	-7	SER	-	expression tag	UNP Q8TL28
H	-6	GLY	-	expression tag	UNP Q8TL28
H	-5	LEU	-	expression tag	UNP Q8TL28
H	-4	VAL	-	expression tag	UNP Q8TL28
H	-3	PRO	-	expression tag	UNP Q8TL28
H	-2	ARG	-	expression tag	UNP Q8TL28
H	-1	GLY	-	expression tag	UNP Q8TL28
H	0	SER	-	expression tag	UNP Q8TL28
H	229	ALA	GLU	variant	UNP Q8TL28
I	-17	GLY	-	expression tag	UNP Q8TL28
I	-16	SER	-	expression tag	UNP Q8TL28
I	-15	SER	-	expression tag	UNP Q8TL28
I	-14	HIS	-	expression tag	UNP Q8TL28
I	-13	HIS	-	expression tag	UNP Q8TL28
I	-12	HIS	-	expression tag	UNP Q8TL28
I	-11	HIS	-	expression tag	UNP Q8TL28
I	-10	HIS	-	expression tag	UNP Q8TL28
I	-9	HIS	-	expression tag	UNP Q8TL28
I	-8	SER	-	expression tag	UNP Q8TL28
I	-7	SER	-	expression tag	UNP Q8TL28
I	-6	GLY	-	expression tag	UNP Q8TL28
I	-5	LEU	-	expression tag	UNP Q8TL28
I	-4	VAL	-	expression tag	UNP Q8TL28
I	-3	PRO	-	expression tag	UNP Q8TL28
I	-2	ARG	-	expression tag	UNP Q8TL28
I	-1	GLY	-	expression tag	UNP Q8TL28

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Chain	Residue	Modelled	Actual	Comment	Reference
I	0	SER	-	expression tag	UNP Q8TL28
I	229	ALA	GLU	variant	UNP Q8TL28
J	-17	GLY	-	expression tag	UNP Q8TL28
J	-16	SER	-	expression tag	UNP Q8TL28
J	-15	SER	-	expression tag	UNP Q8TL28
J	-14	HIS	-	expression tag	UNP Q8TL28
J	-13	HIS	-	expression tag	UNP Q8TL28
J	-12	HIS	-	expression tag	UNP Q8TL28
J	-11	HIS	-	expression tag	UNP Q8TL28
J	-10	HIS	-	expression tag	UNP Q8TL28
J	-9	HIS	-	expression tag	UNP Q8TL28
J	-8	SER	-	expression tag	UNP Q8TL28
J	-7	SER	-	expression tag	UNP Q8TL28
J	-6	GLY	-	expression tag	UNP Q8TL28
J	-5	LEU	-	expression tag	UNP Q8TL28
J	-4	VAL	-	expression tag	UNP Q8TL28
J	-3	PRO	-	expression tag	UNP Q8TL28
J	-2	ARG	-	expression tag	UNP Q8TL28
J	-1	GLY	-	expression tag	UNP Q8TL28
J	0	SER	-	expression tag	UNP Q8TL28
J	229	ALA	GLU	variant	UNP Q8TL28
K	-17	GLY	-	expression tag	UNP Q8TL28
K	-16	SER	-	expression tag	UNP Q8TL28
K	-15	SER	-	expression tag	UNP Q8TL28
K	-14	HIS	-	expression tag	UNP Q8TL28
K	-13	HIS	-	expression tag	UNP Q8TL28
K	-12	HIS	-	expression tag	UNP Q8TL28
K	-11	HIS	-	expression tag	UNP Q8TL28
K	-10	HIS	-	expression tag	UNP Q8TL28
K	-9	HIS	-	expression tag	UNP Q8TL28
K	-8	SER	-	expression tag	UNP Q8TL28
K	-7	SER	-	expression tag	UNP Q8TL28
K	-6	GLY	-	expression tag	UNP Q8TL28
K	-5	LEU	-	expression tag	UNP Q8TL28
K	-4	VAL	-	expression tag	UNP Q8TL28
K	-3	PRO	-	expression tag	UNP Q8TL28
K	-2	ARG	-	expression tag	UNP Q8TL28
K	-1	GLY	-	expression tag	UNP Q8TL28
K	0	SER	-	expression tag	UNP Q8TL28
K	229	ALA	GLU	variant	UNP Q8TL28
L	-17	GLY	-	expression tag	UNP Q8TL28
L	-16	SER	-	expression tag	UNP Q8TL28

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Chain	Residue	Modelled	Actual	Comment	Reference
L	-15	SER	-	expression tag	UNP Q8TL28
L	-14	HIS	-	expression tag	UNP Q8TL28
L	-13	HIS	-	expression tag	UNP Q8TL28
L	-12	HIS	-	expression tag	UNP Q8TL28
L	-11	HIS	-	expression tag	UNP Q8TL28
L	-10	HIS	-	expression tag	UNP Q8TL28
L	-9	HIS	-	expression tag	UNP Q8TL28
L	-8	SER	-	expression tag	UNP Q8TL28
L	-7	SER	-	expression tag	UNP Q8TL28
L	-6	GLY	-	expression tag	UNP Q8TL28
L	-5	LEU	-	expression tag	UNP Q8TL28
L	-4	VAL	-	expression tag	UNP Q8TL28
L	-3	PRO	-	expression tag	UNP Q8TL28
L	-2	ARG	-	expression tag	UNP Q8TL28
L	-1	GLY	-	expression tag	UNP Q8TL28
L	0	SER	-	expression tag	UNP Q8TL28
L	229	ALA	GLU	variant	UNP Q8TL28
M	-17	GLY	-	expression tag	UNP Q8TL28
M	-16	SER	-	expression tag	UNP Q8TL28
M	-15	SER	-	expression tag	UNP Q8TL28
M	-14	HIS	-	expression tag	UNP Q8TL28
M	-13	HIS	-	expression tag	UNP Q8TL28
M	-12	HIS	-	expression tag	UNP Q8TL28
M	-11	HIS	-	expression tag	UNP Q8TL28
M	-10	HIS	-	expression tag	UNP Q8TL28
M	-9	HIS	-	expression tag	UNP Q8TL28
M	-8	SER	-	expression tag	UNP Q8TL28
M	-7	SER	-	expression tag	UNP Q8TL28
M	-6	GLY	-	expression tag	UNP Q8TL28
M	-5	LEU	-	expression tag	UNP Q8TL28
M	-4	VAL	-	expression tag	UNP Q8TL28
M	-3	PRO	-	expression tag	UNP Q8TL28
M	-2	ARG	-	expression tag	UNP Q8TL28
M	-1	GLY	-	expression tag	UNP Q8TL28
M	0	SER	-	expression tag	UNP Q8TL28
M	229	ALA	GLU	variant	UNP Q8TL28
N	-17	GLY	-	expression tag	UNP Q8TL28
N	-16	SER	-	expression tag	UNP Q8TL28
N	-15	SER	-	expression tag	UNP Q8TL28
N	-14	HIS	-	expression tag	UNP Q8TL28
N	-13	HIS	-	expression tag	UNP Q8TL28
N	-12	HIS	-	expression tag	UNP Q8TL28

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Chain	Residue	Modelled	Actual	Comment	Reference
N	-11	HIS	-	expression tag	UNP Q8TL28
N	-10	HIS	-	expression tag	UNP Q8TL28
N	-9	HIS	-	expression tag	UNP Q8TL28
N	-8	SER	-	expression tag	UNP Q8TL28
N	-7	SER	-	expression tag	UNP Q8TL28
N	-6	GLY	-	expression tag	UNP Q8TL28
N	-5	LEU	-	expression tag	UNP Q8TL28
N	-4	VAL	-	expression tag	UNP Q8TL28
N	-3	PRO	-	expression tag	UNP Q8TL28
N	-2	ARG	-	expression tag	UNP Q8TL28
N	-1	GLY	-	expression tag	UNP Q8TL28
N	0	SER	-	expression tag	UNP Q8TL28
N	229	ALA	GLU	variant	UNP Q8TL28

- Molecule 2 is ZINC ION (three-letter code: ZN) (formula: Zn) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total Zn 1 1	0	0
2	B	1	Total Zn 1 1	0	0
2	C	1	Total Zn 1 1	0	0
2	D	1	Total Zn 1 1	0	0
2	E	1	Total Zn 1 1	0	0
2	F	1	Total Zn 1 1	0	0
2	G	1	Total Zn 1 1	0	0
2	H	1	Total Zn 1 1	0	0
2	I	1	Total Zn 1 1	0	0
2	J	1	Total Zn 1 1	0	0
2	K	1	Total Zn 1 1	0	0
2	L	1	Total Zn 1 1	0	0

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	M	1	Total Zn 1 1	0	0
2	N	1	Total Zn 1 1	0	0

- Molecule 3 is CALCIUM ION (three-letter code: CA) (formula: Ca) (labeled as "Ligand of Interest" by depositor).

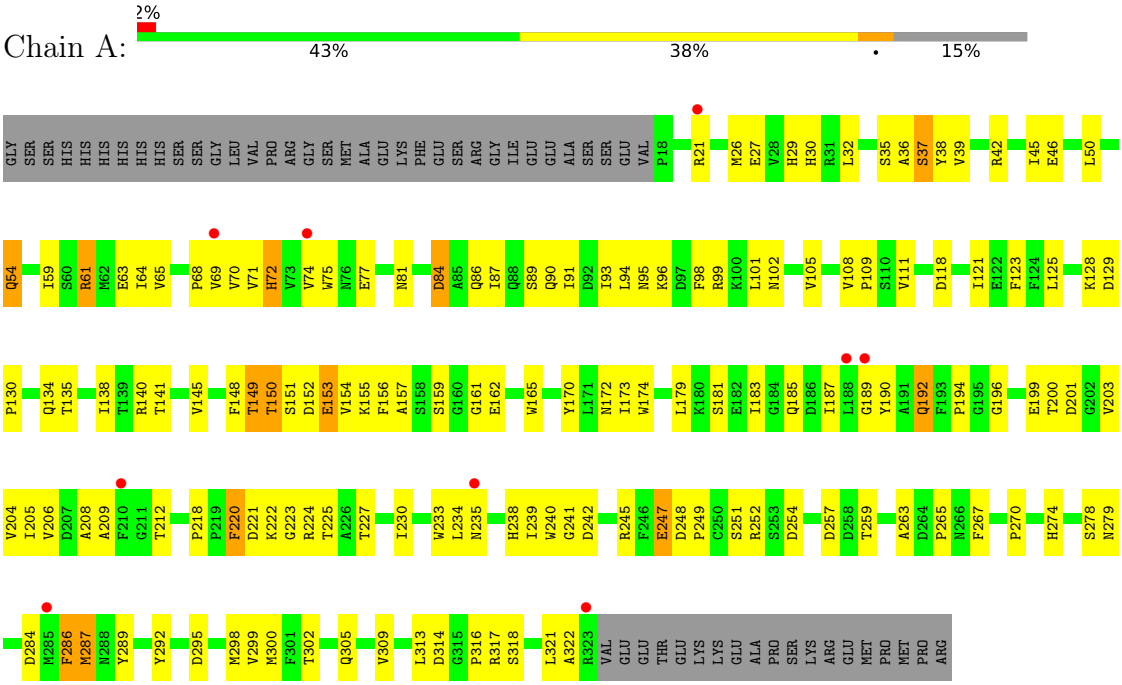
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total Ca 1 1	0	0
3	B	1	Total Ca 1 1	0	0
3	C	1	Total Ca 1 1	0	0
3	D	1	Total Ca 1 1	0	0
3	E	1	Total Ca 1 1	0	0
3	F	1	Total Ca 1 1	0	0
3	G	1	Total Ca 1 1	0	0
3	H	1	Total Ca 1 1	0	0
3	I	1	Total Ca 1 1	0	0
3	J	1	Total Ca 1 1	0	0
3	K	1	Total Ca 1 1	0	0
3	L	1	Total Ca 1 1	0	0
3	M	1	Total Ca 1 1	0	0
3	N	1	Total Ca 1 1	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.

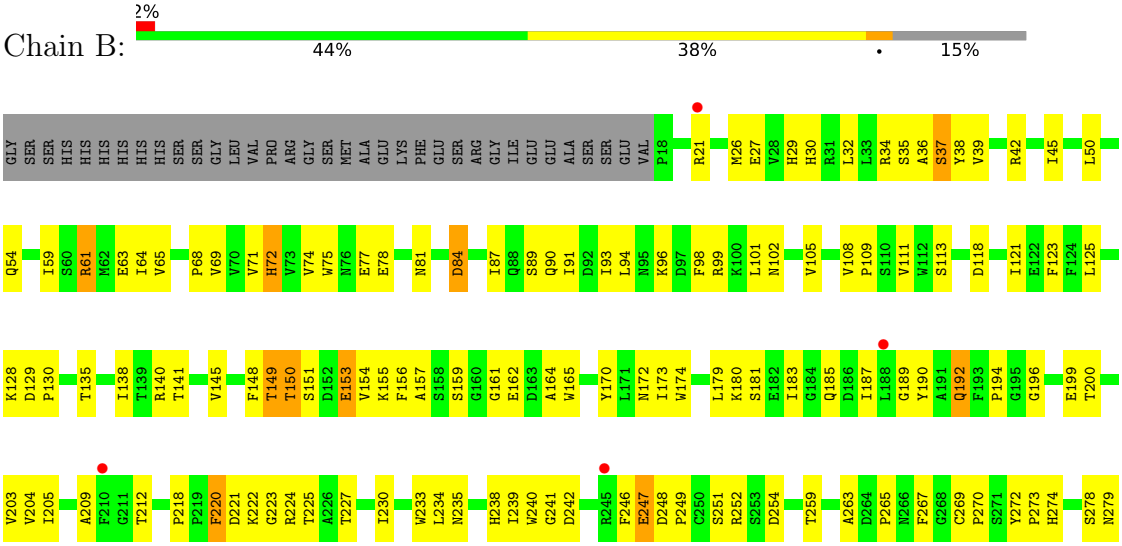
• Molecule 1: Ulilysin

Chain A:



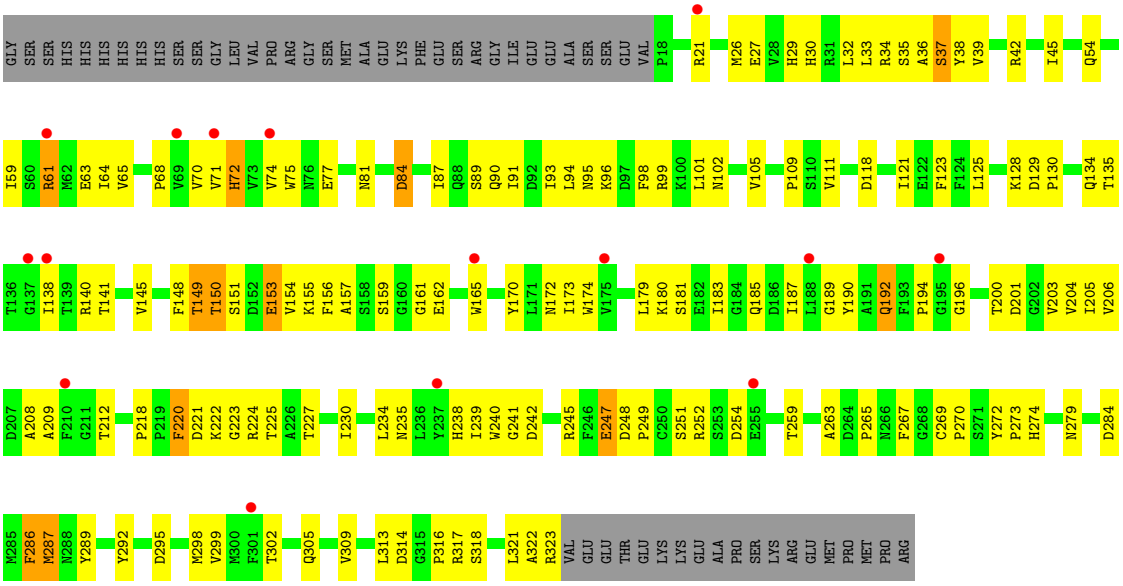
• Molecule 1: Ulilysin

Chain B:



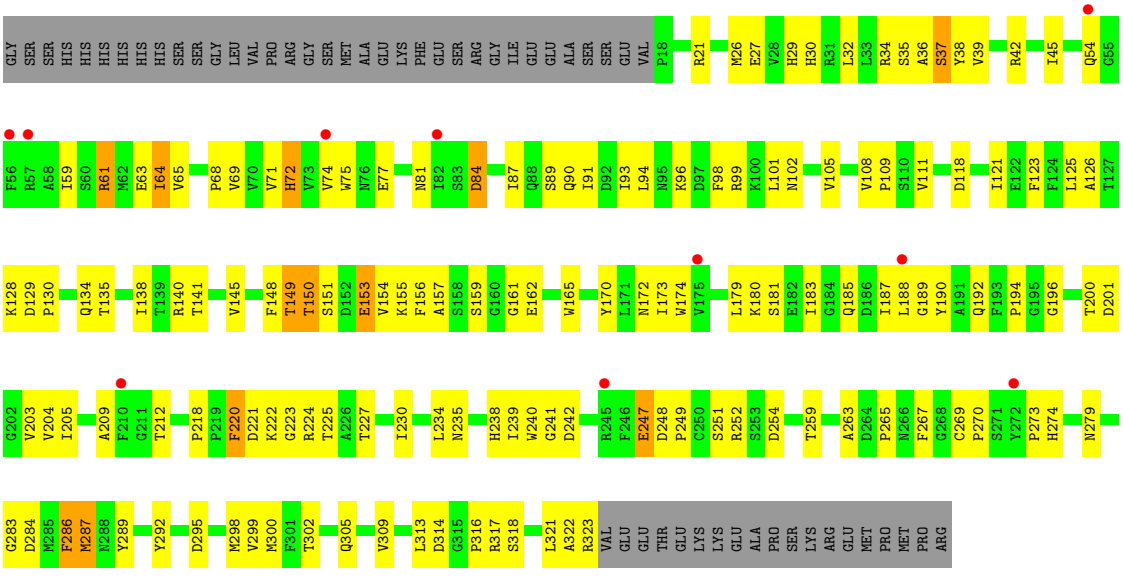
• Molecule 1: Ulilysin

Chain C:



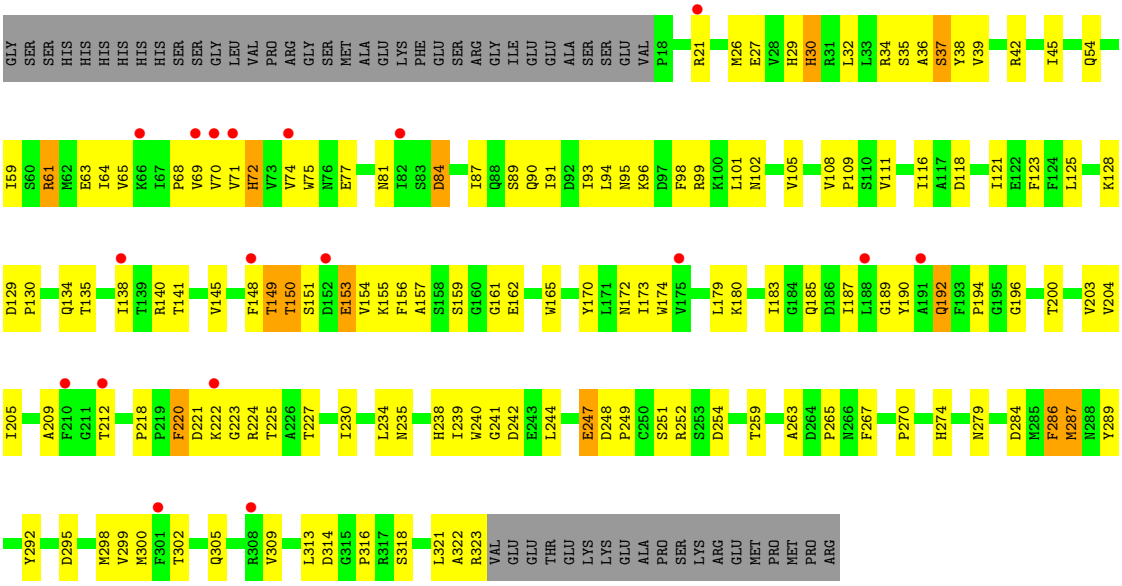
• Molecule 1: Ulilysin

Chain D:



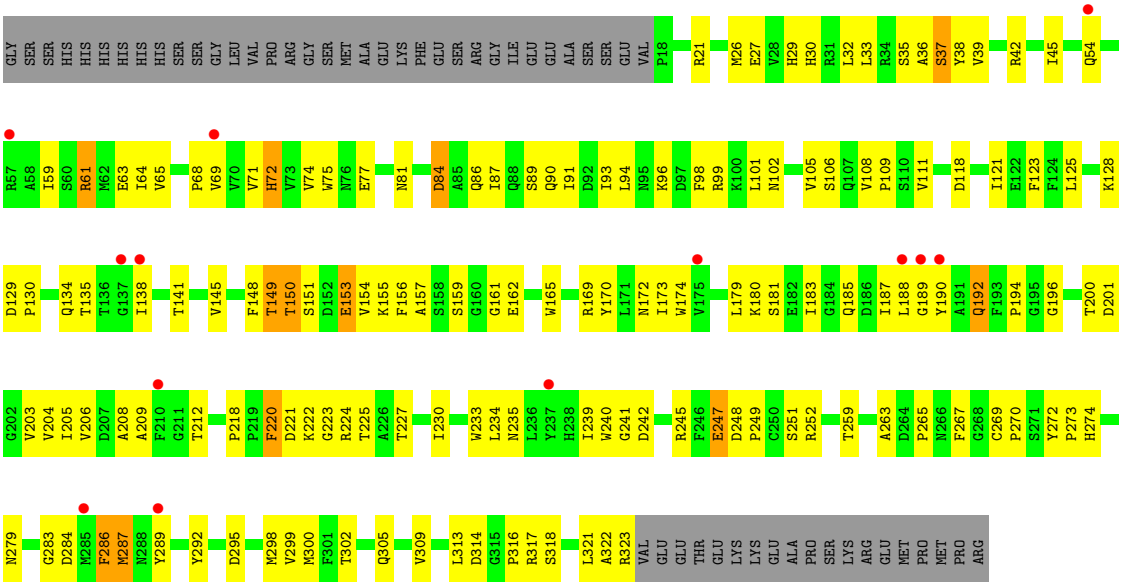
• Molecule 1: Ulilysin

Chain E:



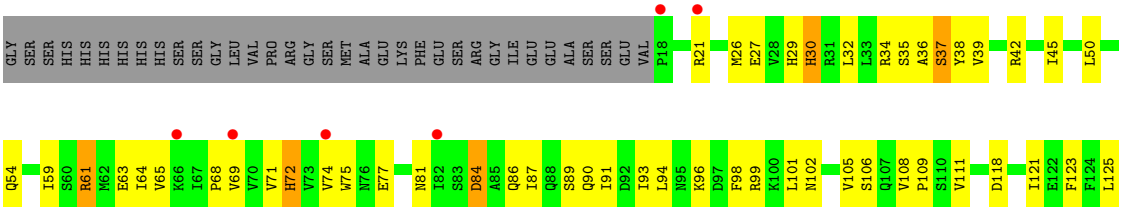
• Molecule 1: Ulilysin

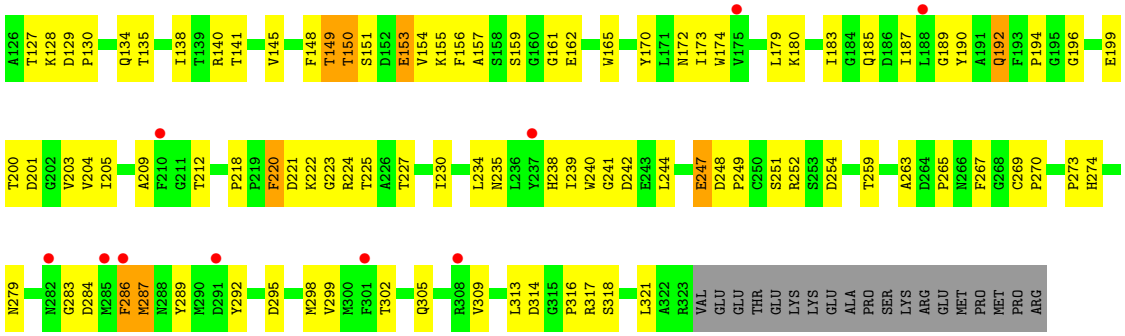
Chain F:



• Molecule 1: Ulilysin

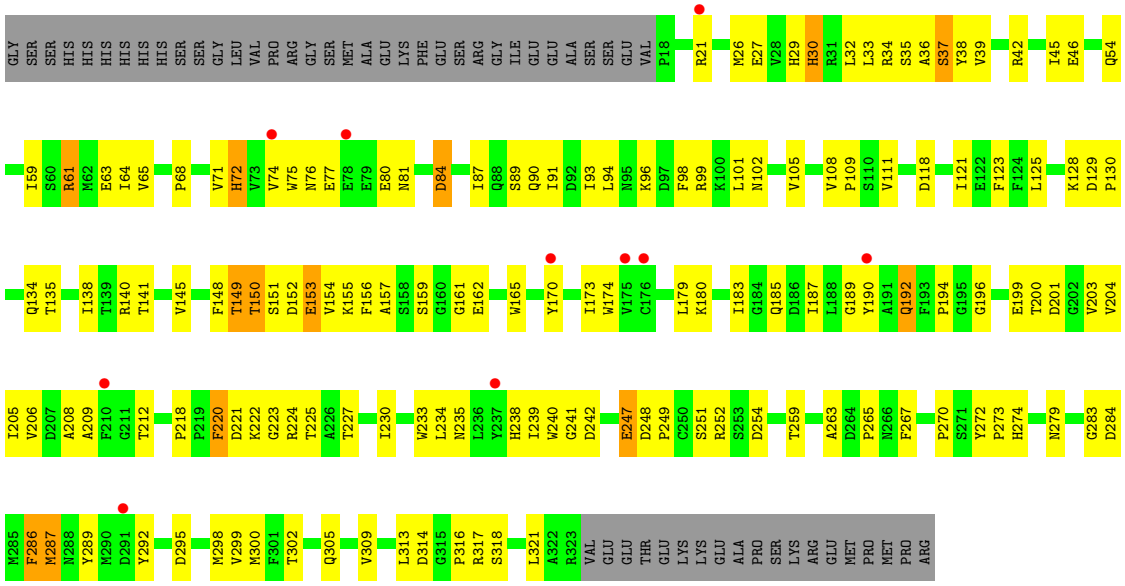
Chain G:





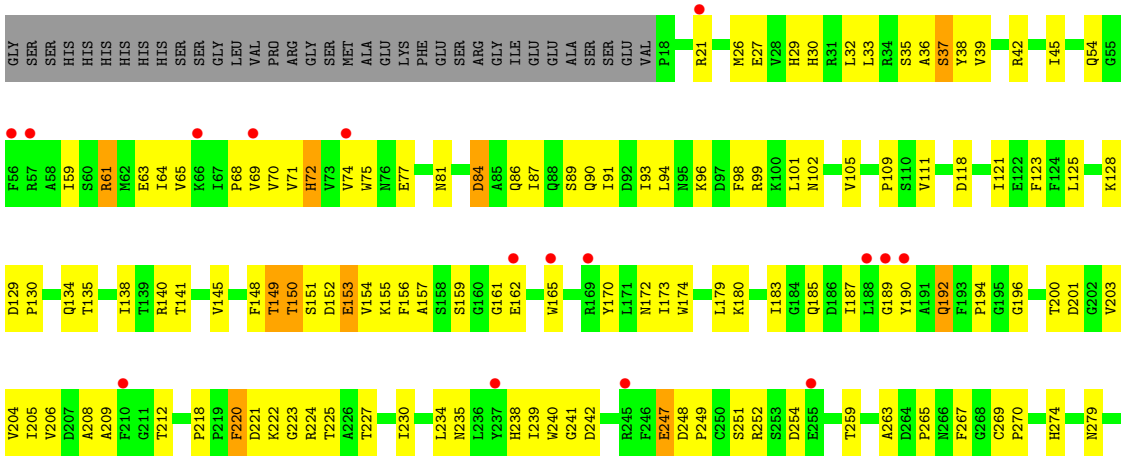
• Molecule 1: Ulilysin

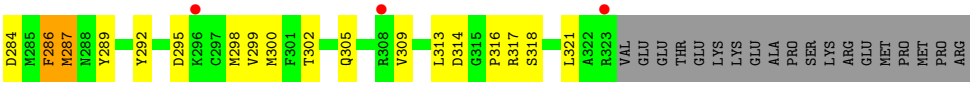
Chain H:



• Molecule 1: Ulilysin

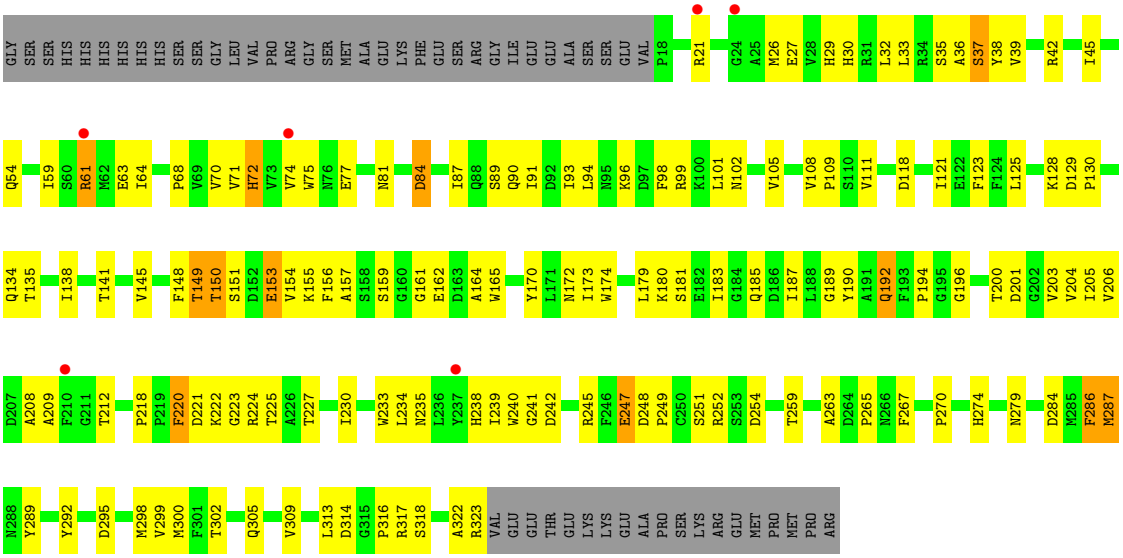
Chain I:





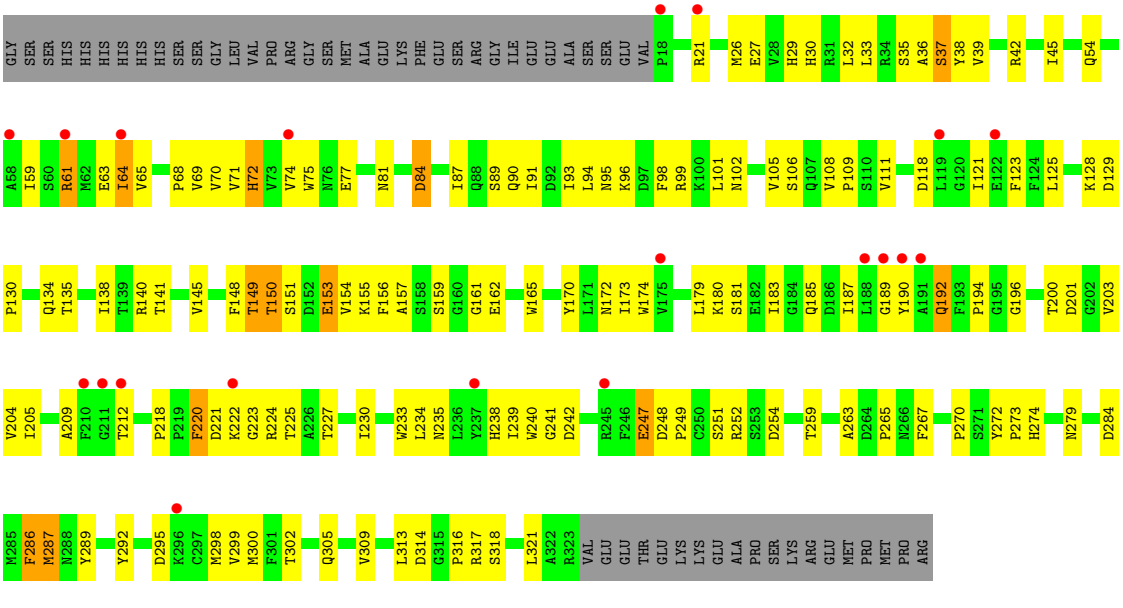
• Molecule 1: Ulilysin

Chain J:



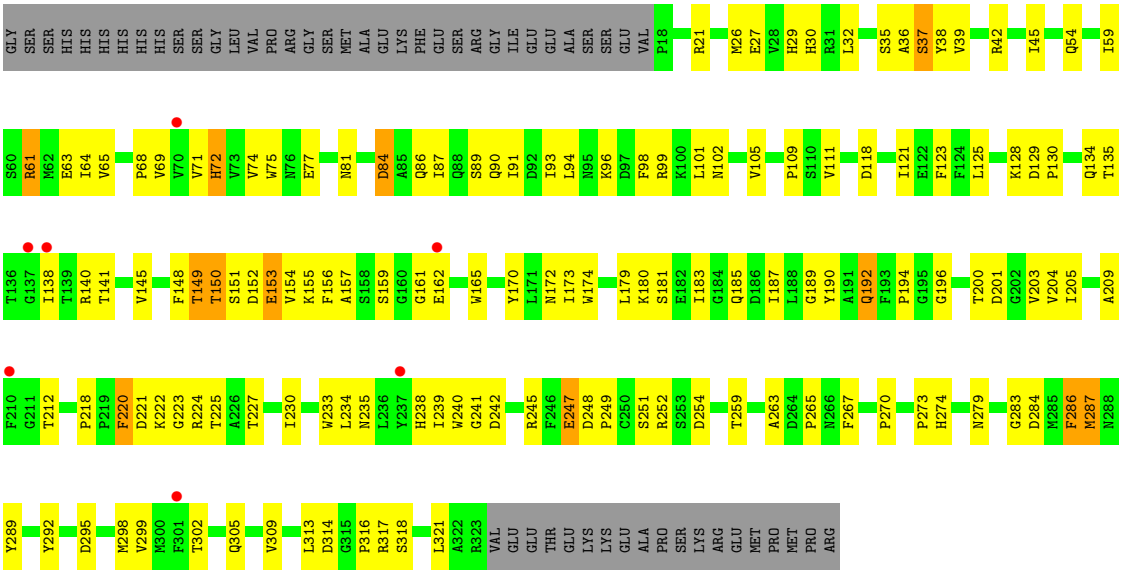
• Molecule 1: Ulilysin

Chain K:



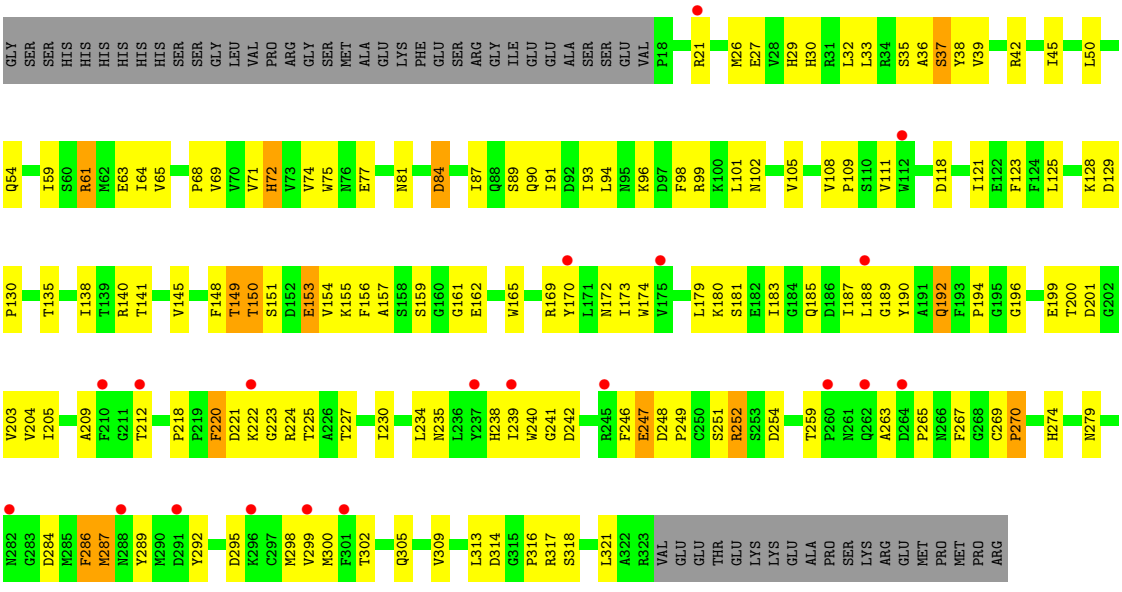
• Molecule 1: Ulilysin

Chain L:



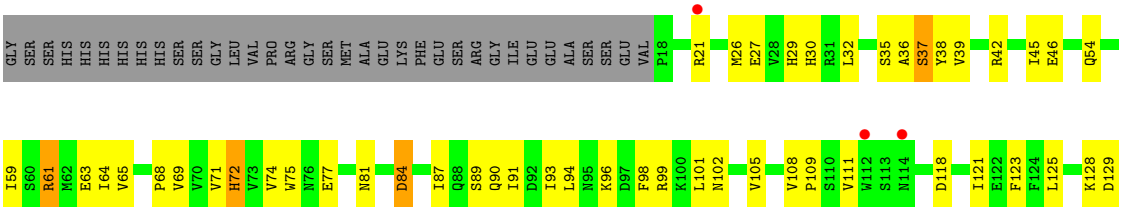
• Molecule 1: Ulilysin

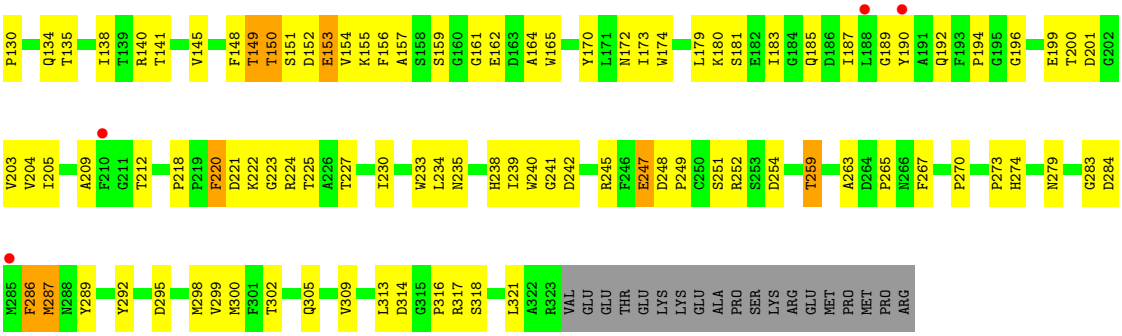
Chain M:



• Molecule 1: Ulilysin

Chain N:




P130 Q134 T135 I138 T139 R140 T141 V145 F148 T149 T150 S151 D152 E153 V154 K155 F156 A157 S158 S159 G160 G161 E162 D163 A164 W165 Y170 L171 N172 I173 W174 L179 K180 S181 E182 I183 G184 Q185 D186 I187 L188 G189 Y190 A191 Q192 F193 P194 G195 G196 E199 T200 D201 G202
V203 V204 I205 A209 F210 G211 T212 P218 P219 F220 D221 K222 G223 R224 T225 A226 T227 I230 W233 L234 N235 H238 I239 W240 G241 D242 R245 F246 E247 D248 P249 C250 S251 R252 S253 D254 T259 A263 D264 P265 N266 F267 P270 P273 H274 N279 G283 D284
M285 F286 M287 N288 Y289 Y292 D295 M298 V299 M300 F301 T302 Q305 V309 L313 D314 G315 P316 R317 S318 L321 A322 R323 VAL GLU GLU THR GLU LYS LYS GLU ALA PRO SER LYS ARG GLU MET PRO MET PRO ARG

4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, α, β, γ	192.10Å 544.40Å 185.50Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	94.72 – 4.50 94.72 – 4.50	Depositor EDS
% Data completeness (in resolution range)	98.6 (94.72-4.50) 99.6 (94.72-4.50)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.20 (at 4.47Å)	Xtriage
Refinement program	PHENIX 1.20_4459	Depositor
R, R_{free}	0.289 , 0.302 0.293 , 0.304	Depositor DCC
R_{free} test set	845 reflections (1.46%)	wwPDB-VP
Wilson B-factor (Å^2)	131.9	Xtriage
Anisotropy	1.029	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.31 , 151.9	EDS
L-test for twinning[2]	$< \|L\| > = 0.41$, $< L^2 > = 0.24$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.86	EDS
Total number of atoms	33614	wwPDB-VP
Average B, all atoms (Å^2)	171.0	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 34.00 % 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 7.3091e-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: CA, ZN

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	0.38	0/2457	0.58	0/3340
1	B	0.42	0/2457	0.59	0/3340
1	C	0.39	0/2457	0.59	0/3340
1	D	0.40	0/2457	0.59	0/3340
1	E	0.41	0/2457	0.60	0/3340
1	F	0.41	0/2457	0.60	0/3340
1	G	0.43	0/2457	0.61	0/3340
1	H	0.47	1/2457 (0.0%)	0.62	0/3340
1	I	0.42	0/2457	0.59	0/3340
1	J	0.43	0/2457	0.60	0/3340
1	K	0.40	0/2457	0.59	0/3340
1	L	0.41	0/2457	0.59	0/3340
1	M	0.39	0/2457	0.59	0/3340
1	N	0.42	0/2457	0.60	0/3340
All	All	0.41	1/34398 (0.0%)	0.60	0/46760

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	H	30	HIS	CB-CG	5.32	1.59	1.50

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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	2399	0	2279	112	0
1	B	2399	0	2279	113	1
1	C	2399	0	2279	107	0
1	D	2399	0	2279	107	0
1	E	2399	0	2279	104	0
1	F	2399	0	2279	113	0
1	G	2399	0	2279	104	0
1	H	2399	0	2279	108	0
1	I	2399	0	2279	106	0
1	J	2399	0	2279	106	0
1	K	2399	0	2279	104	0
1	L	2399	0	2279	102	0
1	M	2399	0	2279	103	0
1	N	2399	0	2279	104	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
2	C	1	0	0	0	0
2	D	1	0	0	0	0
2	E	1	0	0	0	0
2	F	1	0	0	0	0
2	G	1	0	0	0	0
2	H	1	0	0	0	0
2	I	1	0	0	0	0
2	J	1	0	0	0	0
2	K	1	0	0	0	0
2	L	1	0	0	0	0
2	M	1	0	0	0	0
2	N	1	0	0	0	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
3	C	1	0	0	0	0
3	D	1	0	0	0	0
3	E	1	0	0	0	0
3	F	1	0	0	0	0
3	G	1	0	0	0	0
3	H	1	0	0	0	0
3	I	1	0	0	0	0
3	J	1	0	0	0	0
3	K	1	0	0	0	0
3	L	1	0	0	0	0
3	M	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	N	1	0	0	0	0
All	All	33614	0	31906	1446	1

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 22.

The worst 5 of 1446 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:N:174:TRP:HB2	1:N:204:VAL:HG22	1.61	0.82
1:H:174:TRP:HB2	1:H:204:VAL:HG22	1.62	0.82
1:I:174:TRP:HB2	1:I:204:VAL:HG22	1.62	0.81
1:B:174:TRP:HB2	1:B:204:VAL:HG22	1.62	0.80
1:G:174:TRP:HB2	1:G:204:VAL:HG22	1.64	0.79

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:113:SER:OG	1:B:113:SER:OG[4_566]	2.18	0.02

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	304/360 (84%)	286 (94%)	18 (6%)	0	100	100
1	B	304/360 (84%)	287 (94%)	17 (6%)	0	100	100
1	C	304/360 (84%)	289 (95%)	15 (5%)	0	100	100
1	D	304/360 (84%)	289 (95%)	15 (5%)	0	100	100
1	E	304/360 (84%)	286 (94%)	18 (6%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	F	304/360 (84%)	287 (94%)	17 (6%)	0	100	100
1	G	304/360 (84%)	288 (95%)	16 (5%)	0	100	100
1	H	304/360 (84%)	287 (94%)	17 (6%)	0	100	100
1	I	304/360 (84%)	287 (94%)	17 (6%)	0	100	100
1	J	304/360 (84%)	289 (95%)	15 (5%)	0	100	100
1	K	304/360 (84%)	288 (95%)	16 (5%)	0	100	100
1	L	304/360 (84%)	288 (95%)	16 (5%)	0	100	100
1	M	304/360 (84%)	288 (95%)	16 (5%)	0	100	100
1	N	304/360 (84%)	287 (94%)	17 (6%)	0	100	100
All	All	4256/5040 (84%)	4026 (95%)	230 (5%)	0	100	100

There are no Ramachandran outliers to report.

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	262/310 (84%)	233 (89%)	29 (11%)	6	25
1	B	262/310 (84%)	232 (88%)	30 (12%)	5	23
1	C	262/310 (84%)	234 (89%)	28 (11%)	6	26
1	D	262/310 (84%)	233 (89%)	29 (11%)	6	25
1	E	262/310 (84%)	233 (89%)	29 (11%)	6	25
1	F	262/310 (84%)	231 (88%)	31 (12%)	5	23
1	G	262/310 (84%)	232 (88%)	30 (12%)	5	23
1	H	262/310 (84%)	234 (89%)	28 (11%)	6	26
1	I	262/310 (84%)	233 (89%)	29 (11%)	6	25
1	J	262/310 (84%)	234 (89%)	28 (11%)	6	26
1	K	262/310 (84%)	232 (88%)	30 (12%)	5	23
1	L	262/310 (84%)	233 (89%)	29 (11%)	6	25

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	M	262/310 (84%)	230 (88%)	32 (12%)	5 22
1	N	262/310 (84%)	232 (88%)	30 (12%)	5 23
All	All	3668/4340 (84%)	3256 (89%)	412 (11%)	6 24

5 of 412 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	H	267	PHE
1	J	247	GLU
1	N	149	THR
1	I	61	ARG
1	I	267	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 44 such sidechains are listed below:

Mol	Chain	Res	Type
1	J	29	HIS
1	L	72	HIS
1	J	72	HIS
1	K	72	HIS
1	M	29	HIS

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

Of 28 ligands modelled in this entry, 28 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

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	306/360 (85%)	0.28	9 (2%) 51 41	164, 186, 210, 221	0
1	B	306/360 (85%)	0.24	6 (1%) 65 56	151, 170, 187, 204	0
1	C	306/360 (85%)	0.46	15 (4%) 29 25	159, 184, 207, 220	0
1	D	306/360 (85%)	0.28	10 (3%) 46 37	147, 169, 191, 214	0
1	E	306/360 (85%)	0.53	18 (5%) 22 19	145, 166, 188, 221	0
1	F	306/360 (85%)	0.31	13 (4%) 36 30	143, 166, 187, 209	0
1	G	306/360 (85%)	0.47	16 (5%) 27 24	143, 160, 180, 200	0
1	H	306/360 (85%)	0.28	10 (3%) 46 37	120, 149, 164, 190	0
1	I	306/360 (85%)	0.51	19 (6%) 20 17	142, 172, 199, 219	0
1	J	306/360 (85%)	0.26	6 (1%) 65 56	137, 160, 184, 198	0
1	K	306/360 (85%)	0.54	20 (6%) 18 15	159, 186, 211, 228	0
1	L	306/360 (85%)	0.26	7 (2%) 60 51	144, 168, 193, 208	0
1	M	306/360 (85%)	0.43	20 (6%) 18 15	160, 180, 200, 220	0
1	N	306/360 (85%)	0.26	7 (2%) 60 51	141, 163, 182, 193	0
All	All	4284/5040 (85%)	0.36	176 (4%) 37 30	120, 170, 200, 228	0

The worst 5 of 176 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	K	210	PHE	5.9
1	I	210	PHE	4.6
1	F	189	GLY	4.6
1	C	237	TYR	4.5
1	F	188	LEU	4.4

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
3	CA	L	402	1/1	0.71	0.14	162,162,162,162	0
3	CA	G	402	1/1	0.78	0.19	162,162,162,162	0
2	ZN	N	401	1/1	0.81	0.16	159,159,159,159	0
2	ZN	C	401	1/1	0.86	0.15	180,180,180,180	0
3	CA	E	402	1/1	0.86	0.14	177,177,177,177	0
3	CA	B	402	1/1	0.87	0.24	183,183,183,183	0
2	ZN	M	401	1/1	0.87	0.12	177,177,177,177	0
3	CA	J	402	1/1	0.88	0.17	163,163,163,163	0
2	ZN	G	401	1/1	0.88	0.18	159,159,159,159	0
3	CA	D	402	1/1	0.89	0.19	168,168,168,168	0
3	CA	C	402	1/1	0.90	0.21	188,188,188,188	0
2	ZN	A	401	1/1	0.91	0.13	179,179,179,179	0
2	ZN	D	401	1/1	0.92	0.13	156,156,156,156	0
3	CA	M	402	1/1	0.92	0.18	190,190,190,190	0
3	CA	I	402	1/1	0.93	0.11	171,171,171,171	0
2	ZN	B	401	1/1	0.93	0.16	149,149,149,149	0
3	CA	F	402	1/1	0.94	0.20	172,172,172,172	0
2	ZN	H	401	1/1	0.94	0.17	136,136,136,136	0
2	ZN	L	401	1/1	0.94	0.23	145,145,145,145	0
2	ZN	F	401	1/1	0.95	0.17	140,140,140,140	0
2	ZN	E	401	1/1	0.95	0.14	152,152,152,152	0
3	CA	A	402	1/1	0.96	0.20	193,193,193,193	0
3	CA	K	402	1/1	0.96	0.12	191,191,191,191	0
3	CA	H	402	1/1	0.97	0.19	159,159,159,159	0
2	ZN	I	401	1/1	0.97	0.09	142,142,142,142	0
2	ZN	K	401	1/1	0.97	0.13	174,174,174,174	0
2	ZN	J	401	1/1	0.99	0.19	142,142,142,142	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
3	CA	N	402	1/1	0.99	0.19	168,168,168,168	0

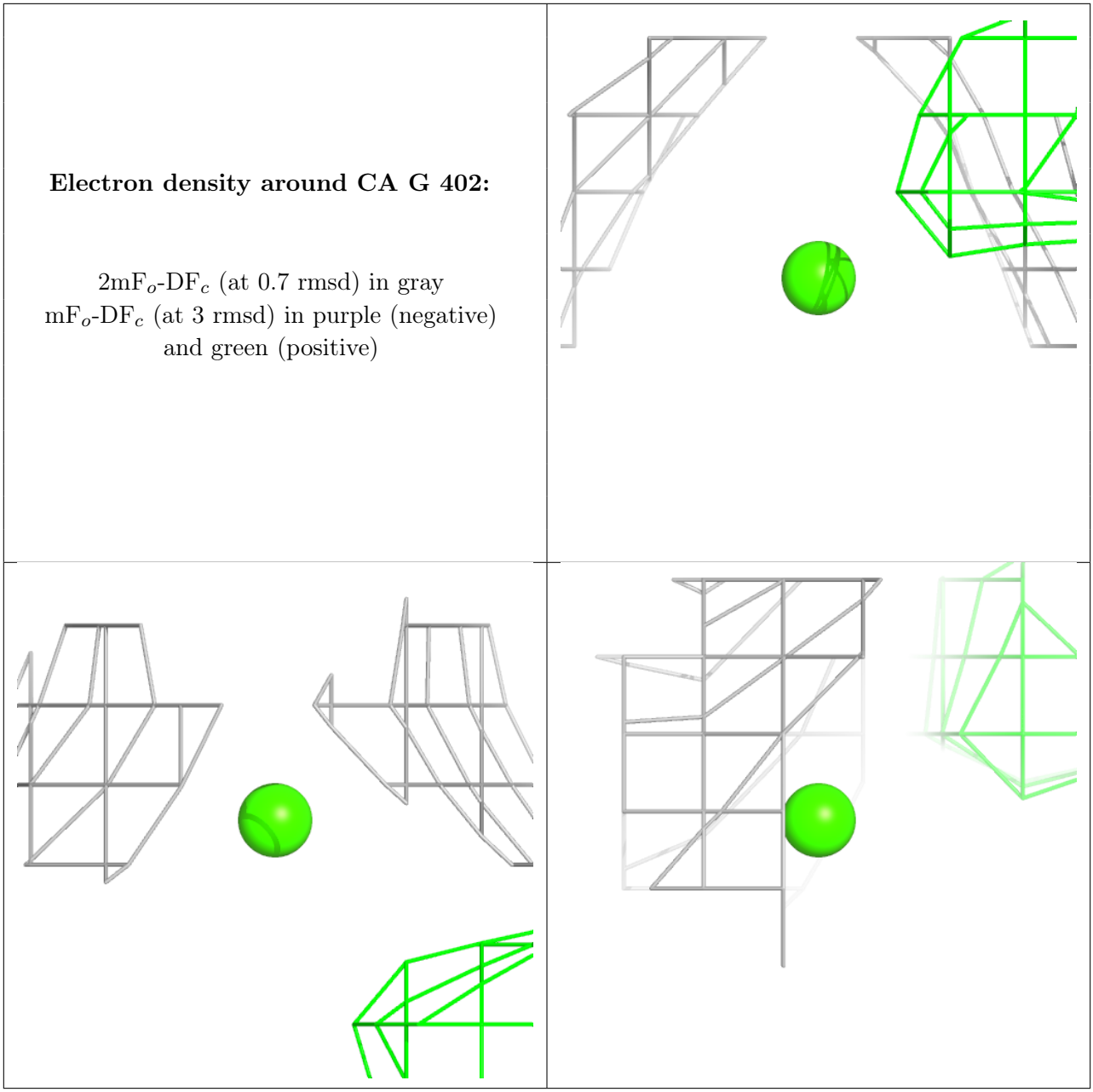
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around CA L 402:

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

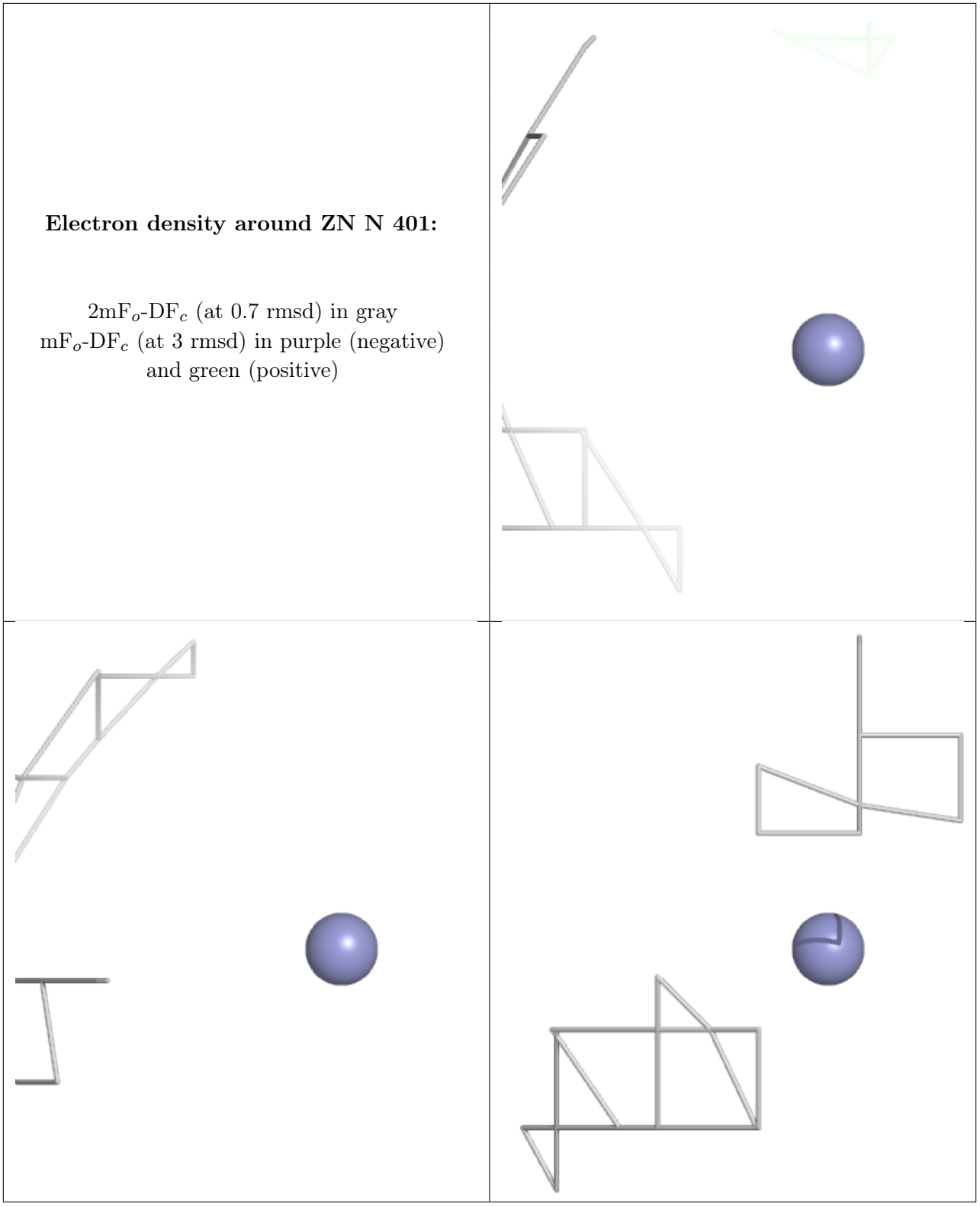
Electron density around CA G 402:

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



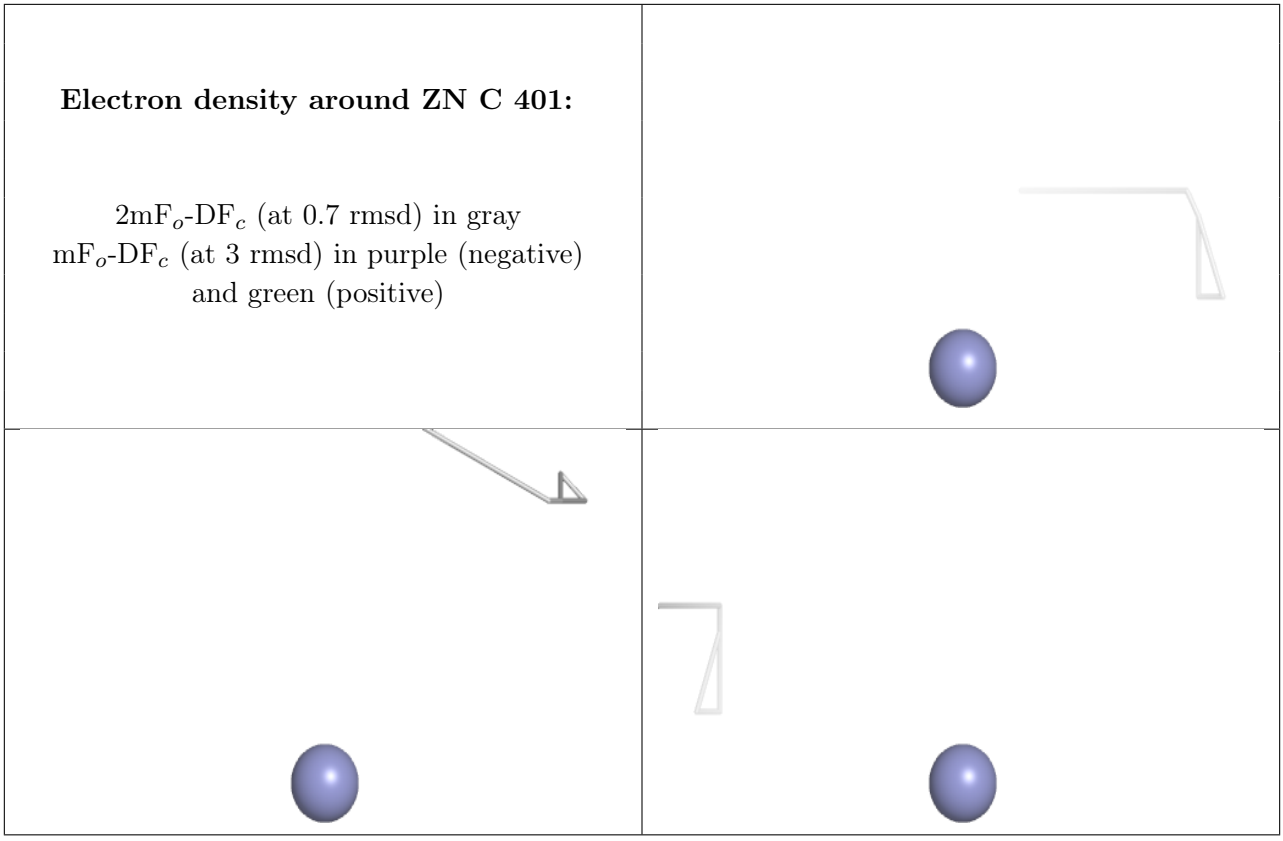
Electron density around ZN N 401:

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



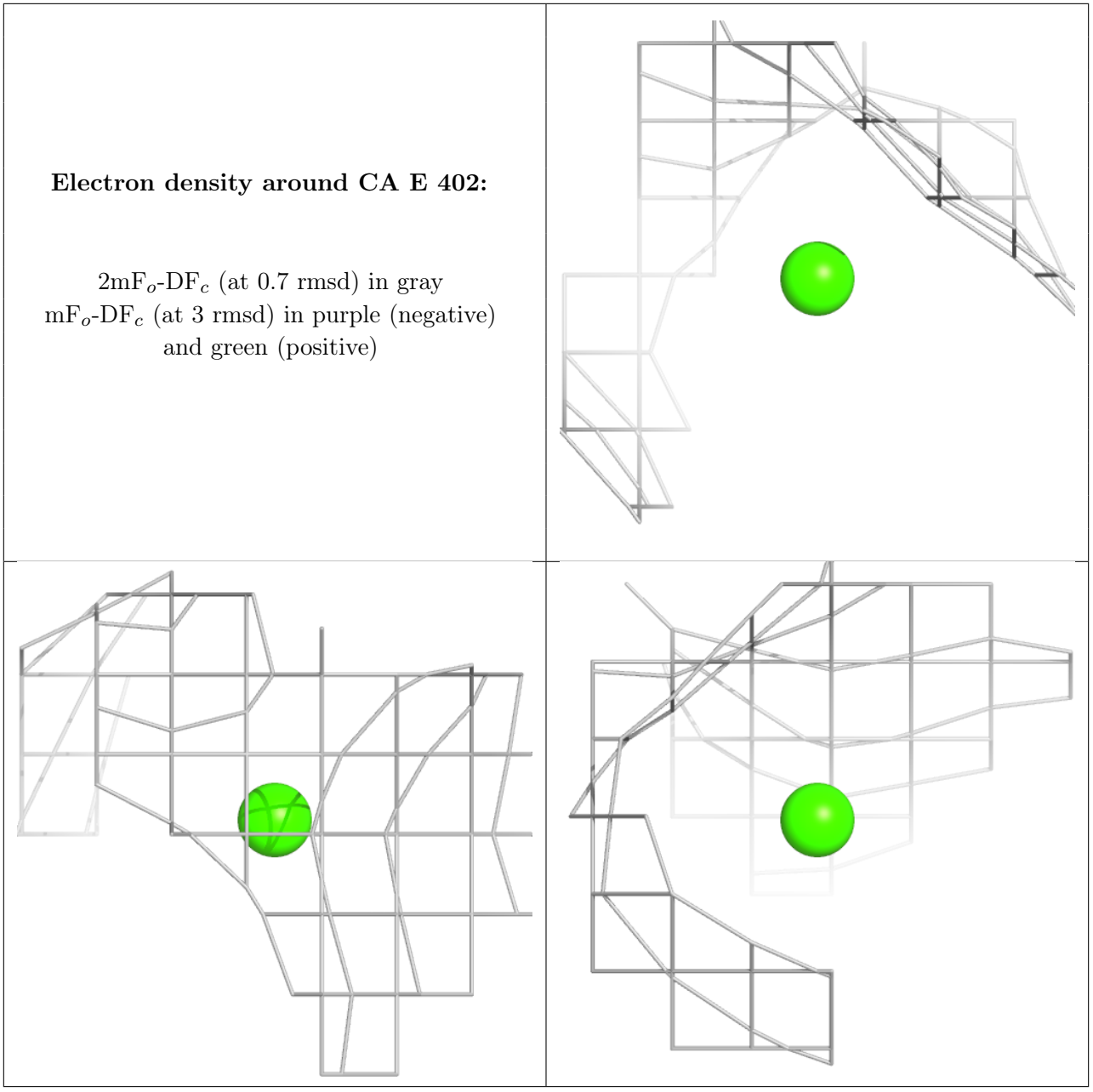
Electron density around ZN C 401:

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



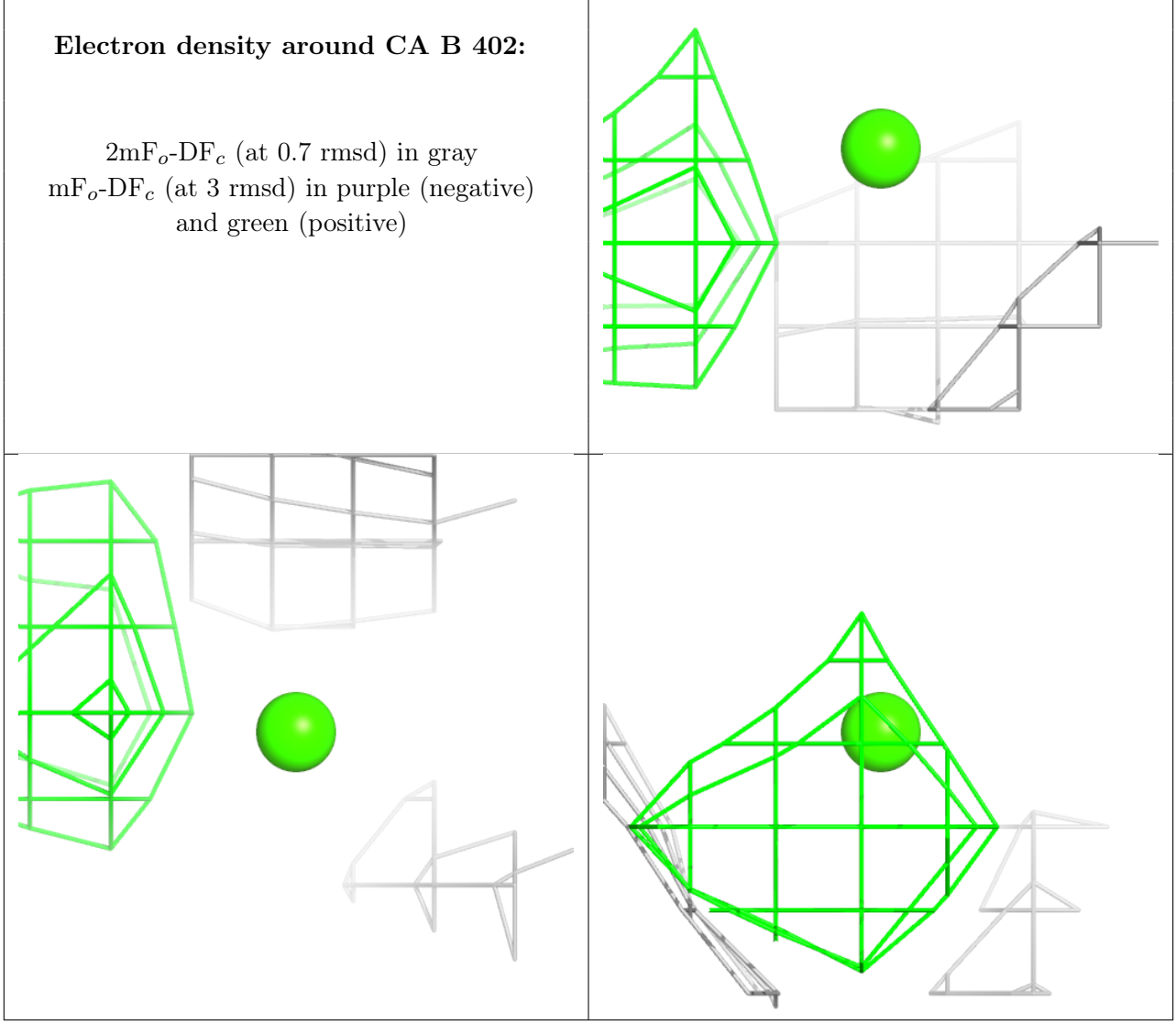
Electron density around CA E 402:

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



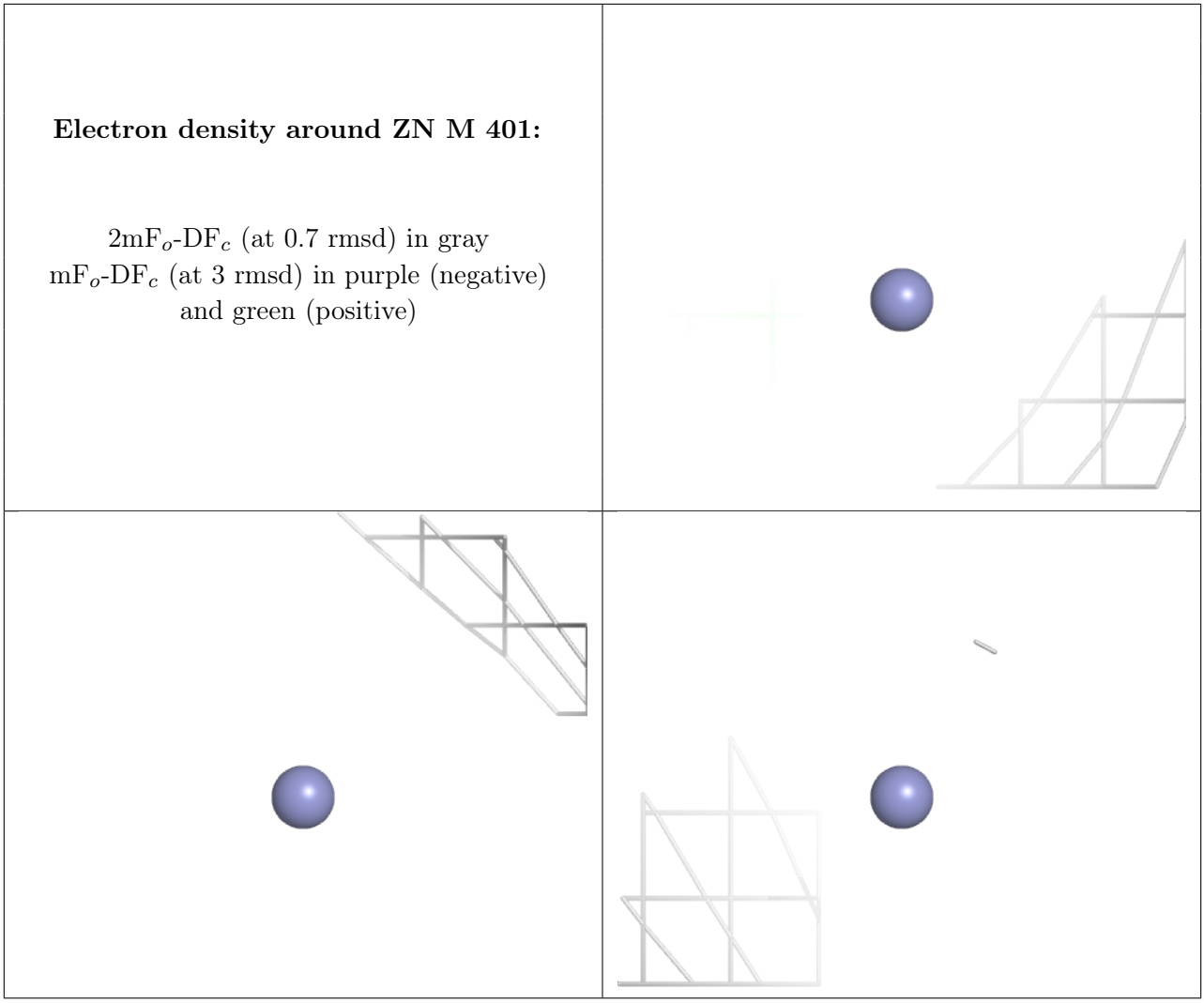
Electron density around CA B 402:

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



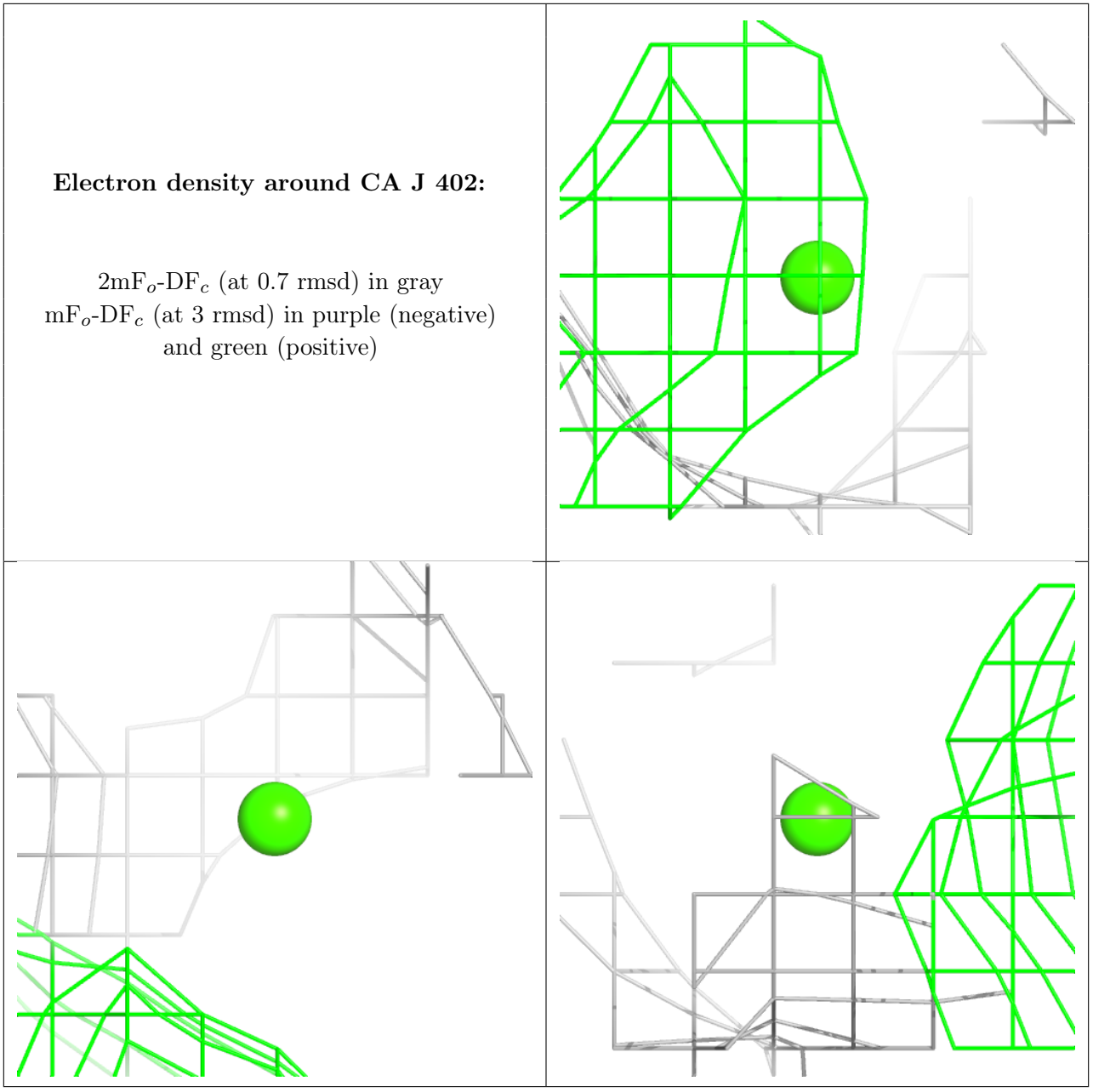
Electron density around ZN M 401:

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



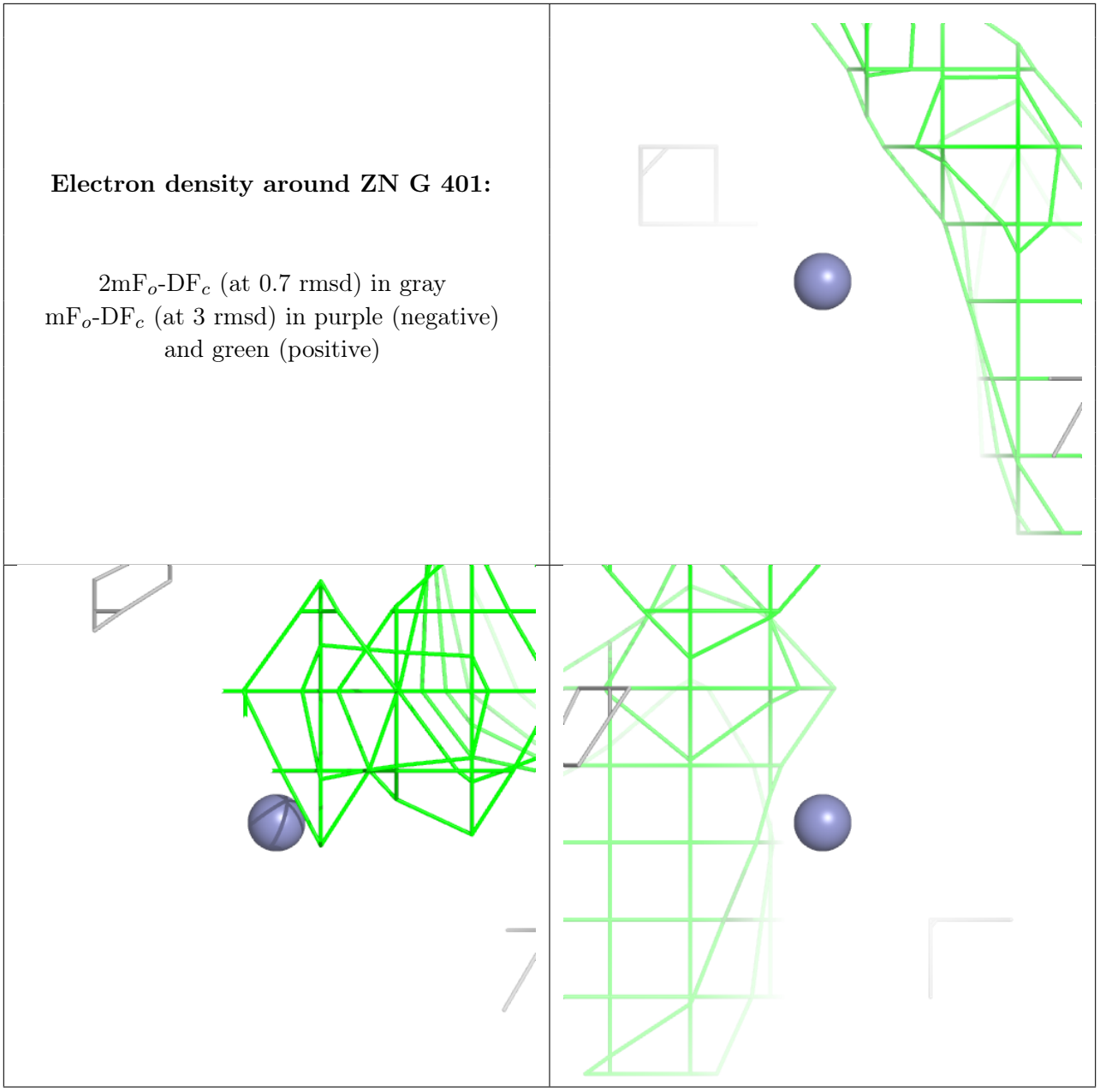
Electron density around CA J 402:

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



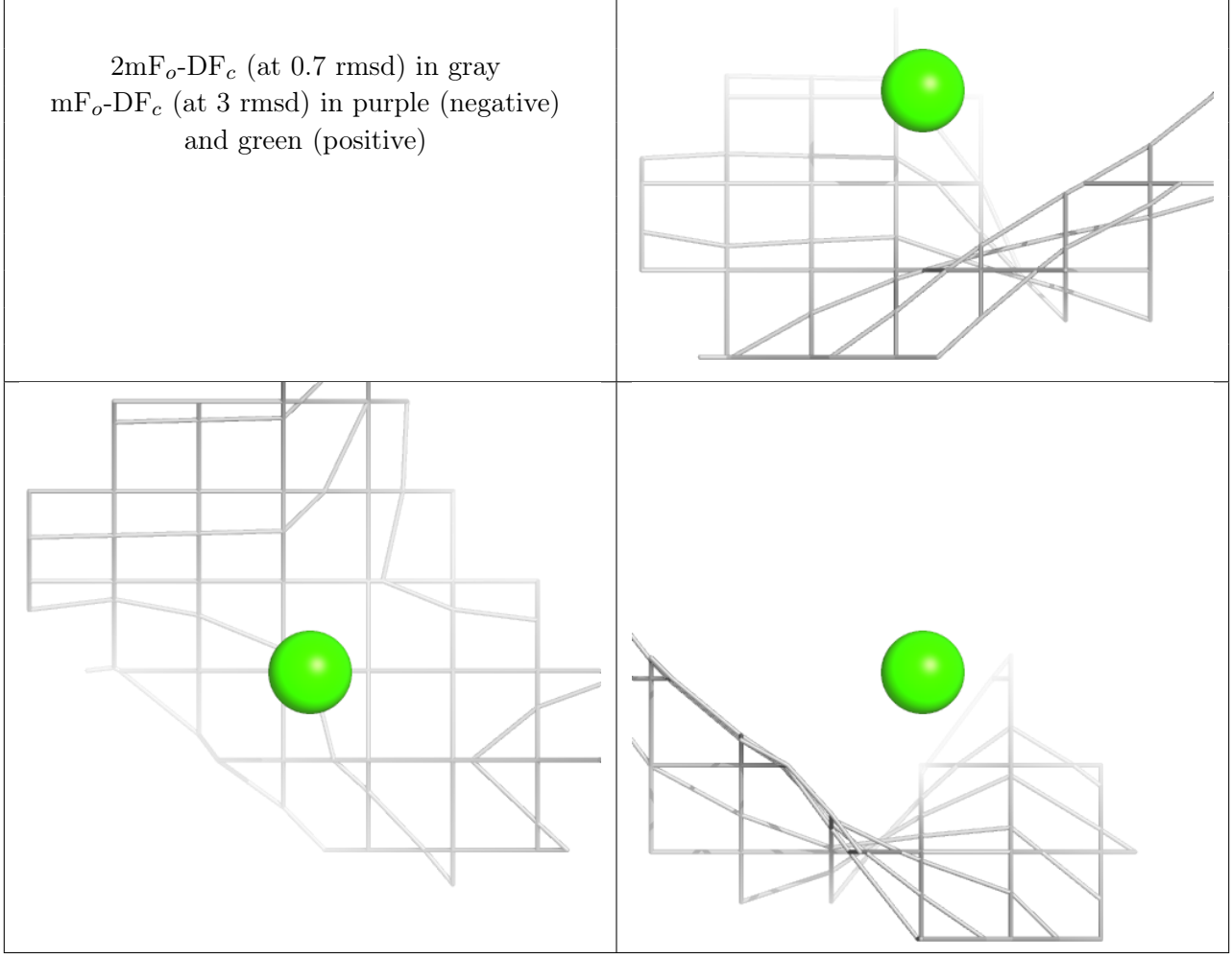
Electron density around ZN G 401:

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



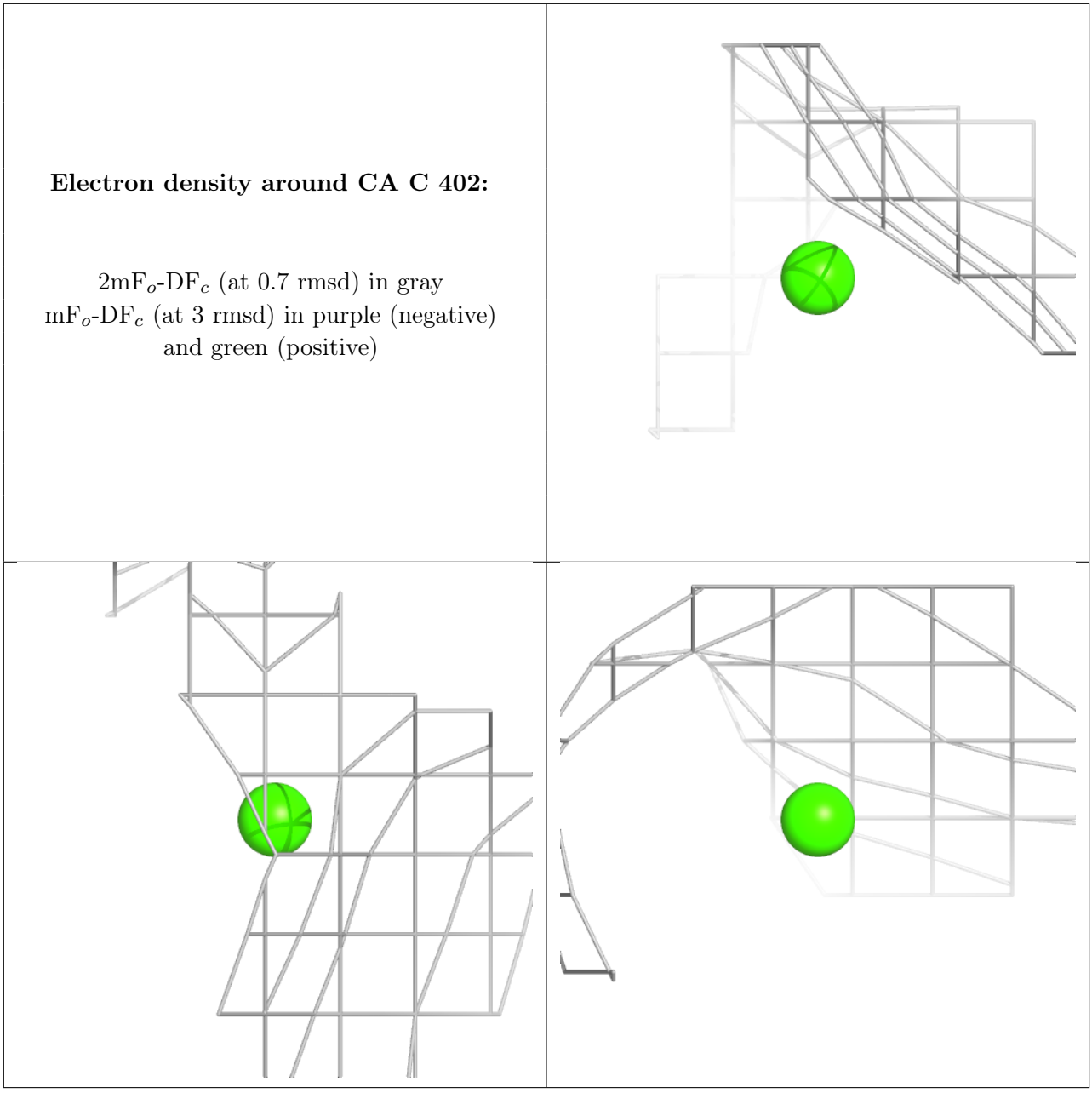
Electron density around CA D 402:

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



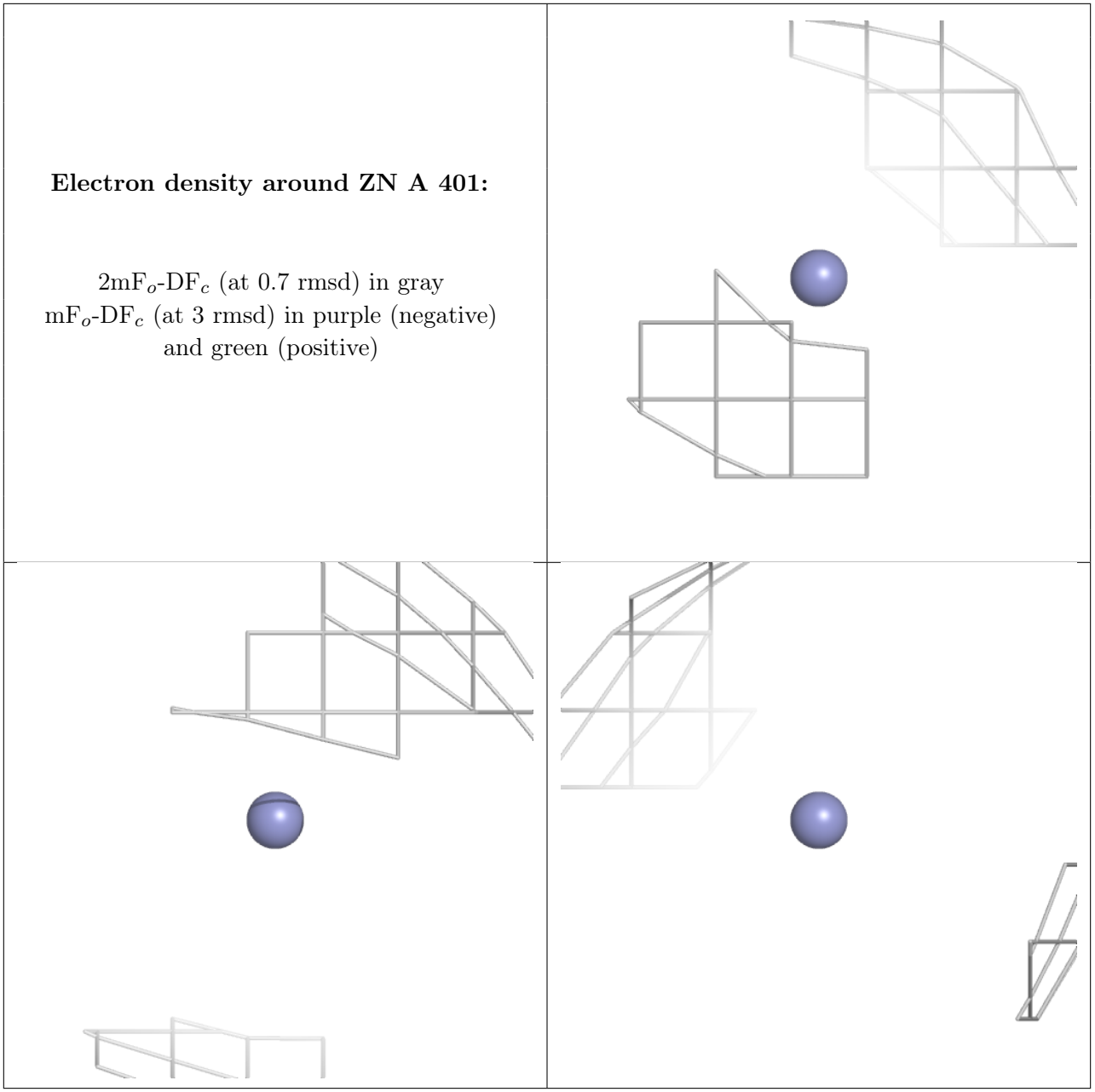
Electron density around CA C 402:

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



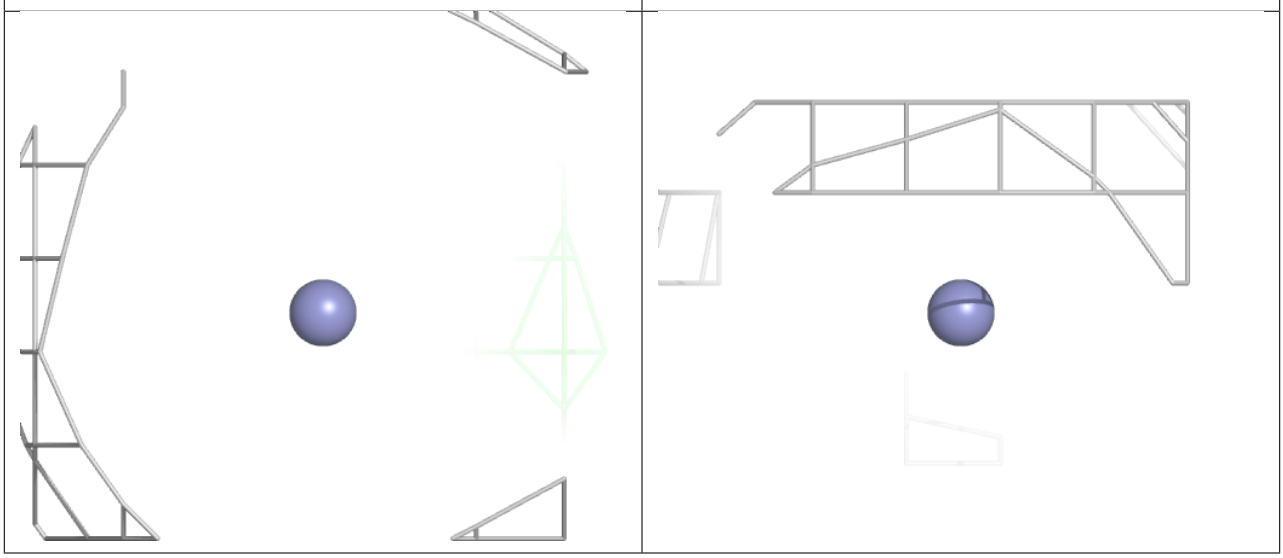
Electron density around ZN A 401:

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



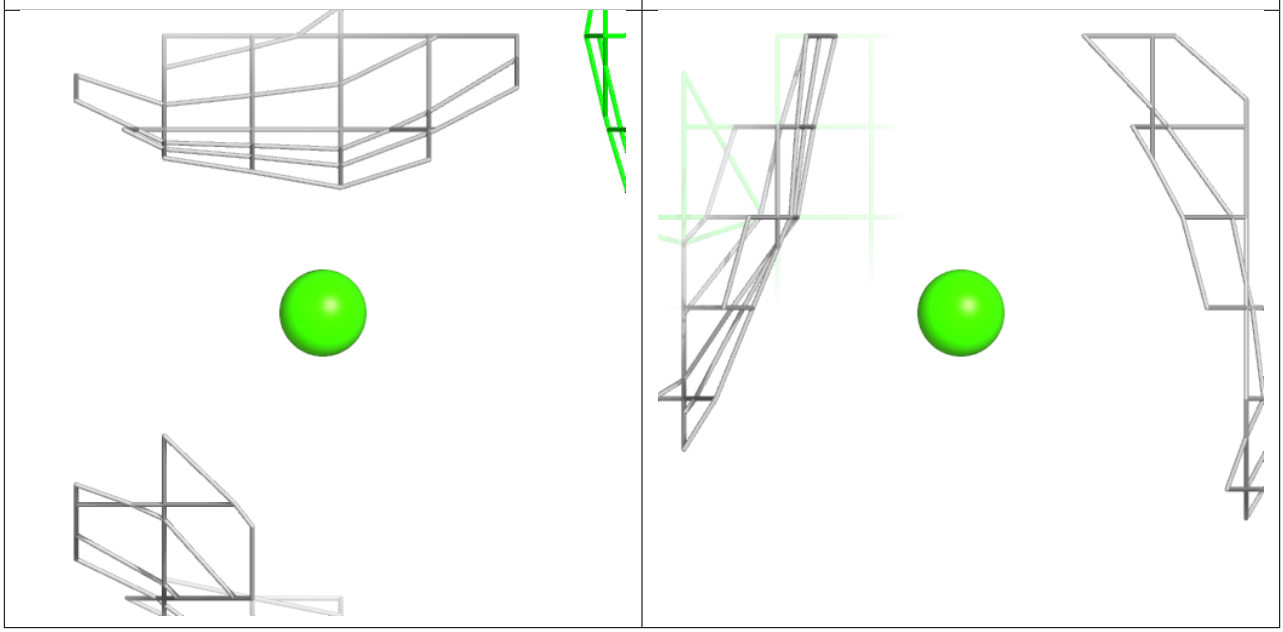
Electron density around ZN D 401:

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



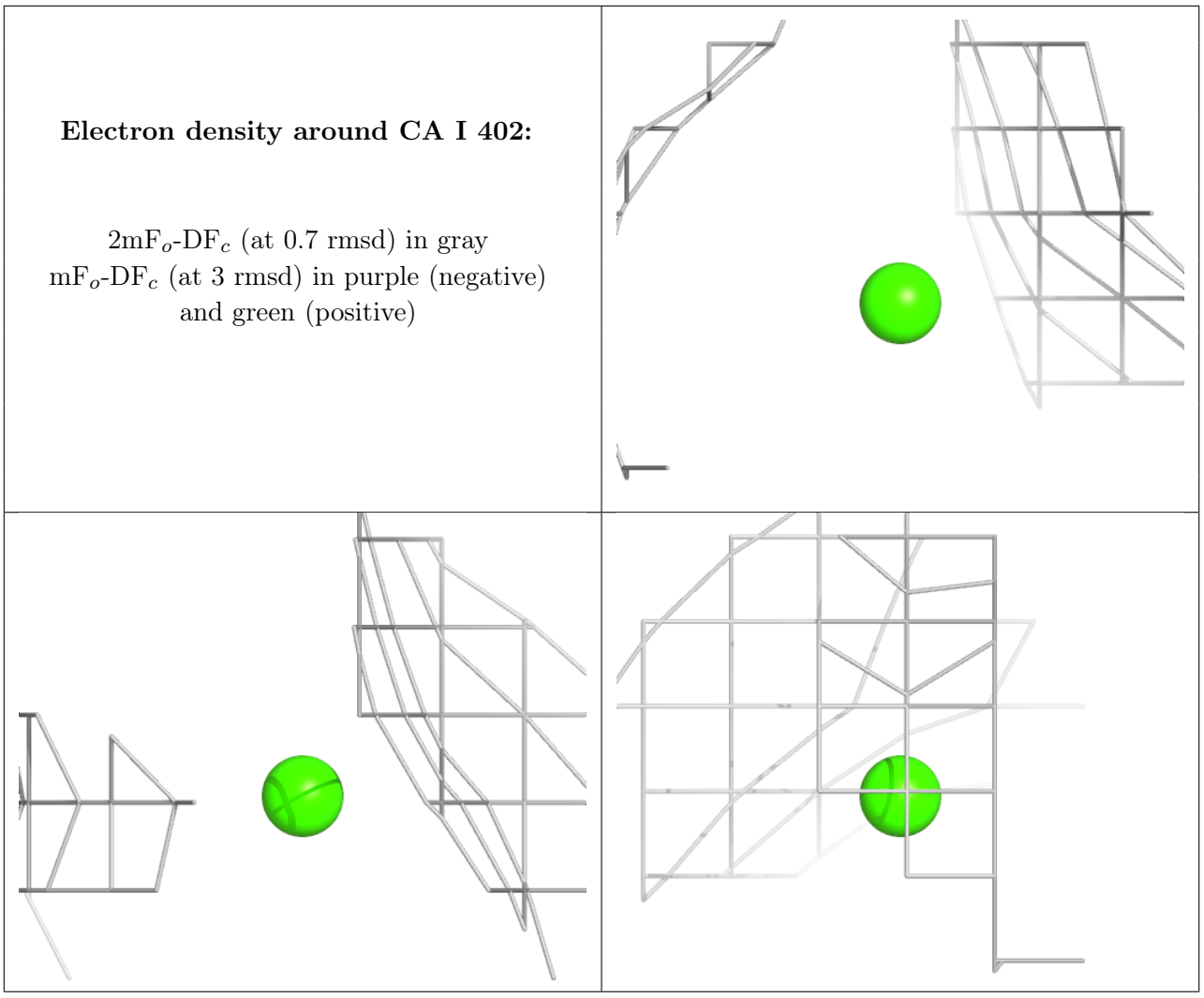
Electron density around CA M 402:

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



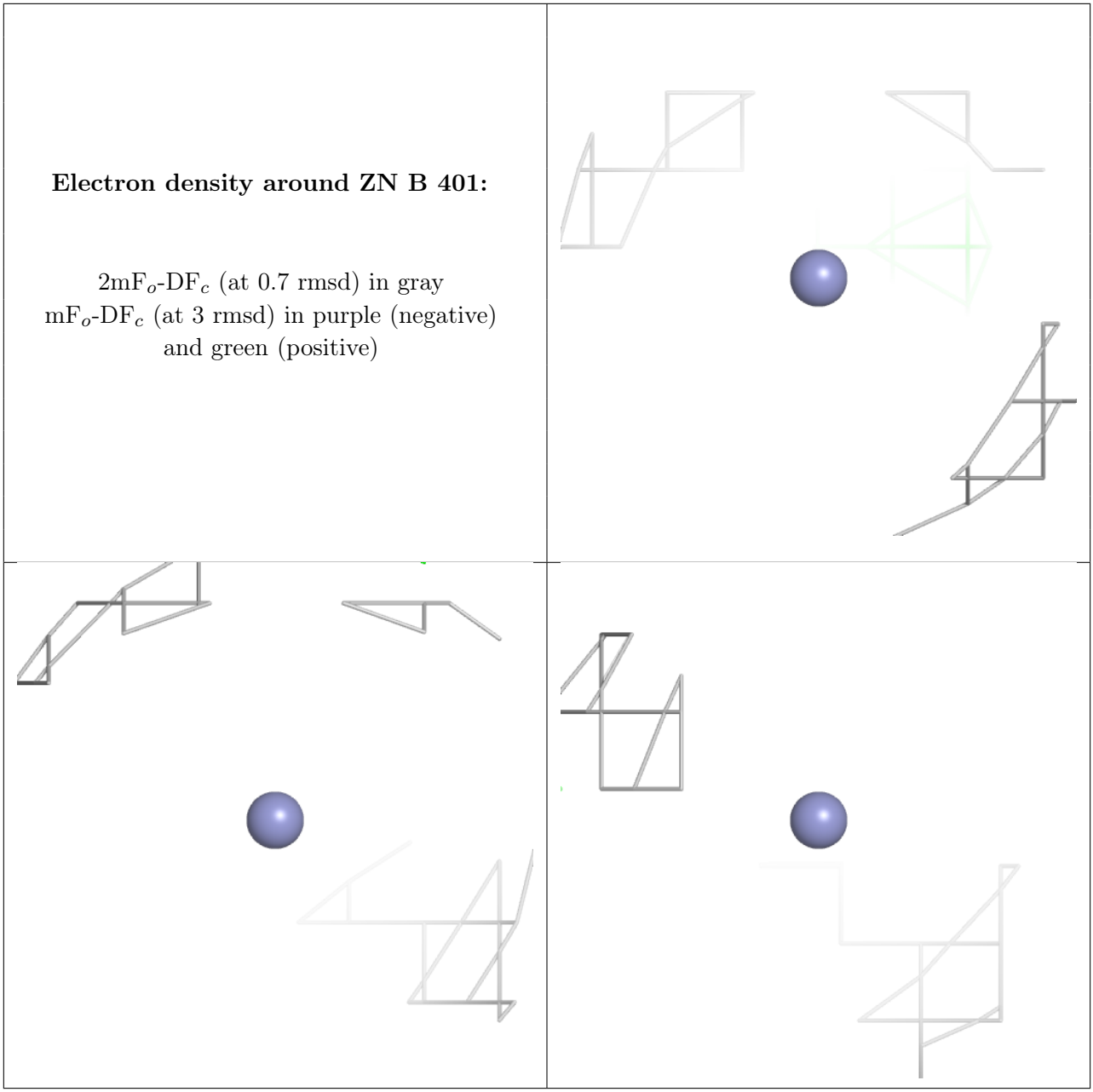
Electron density around CA I 402:

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



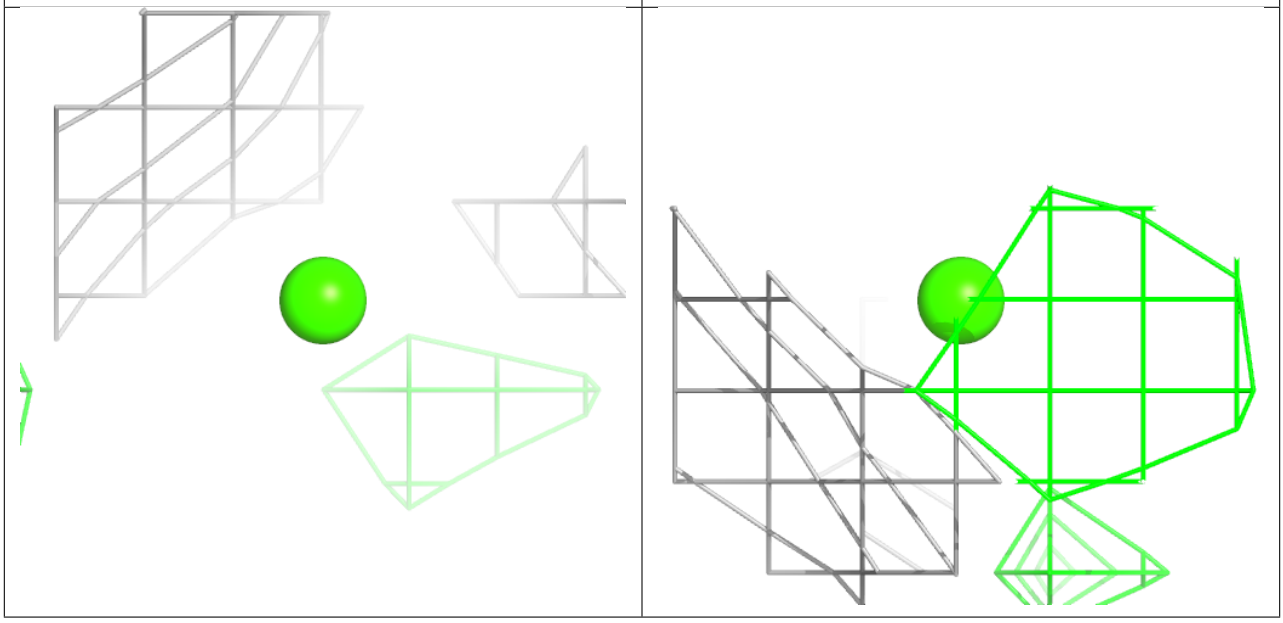
Electron density around ZN B 401:

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



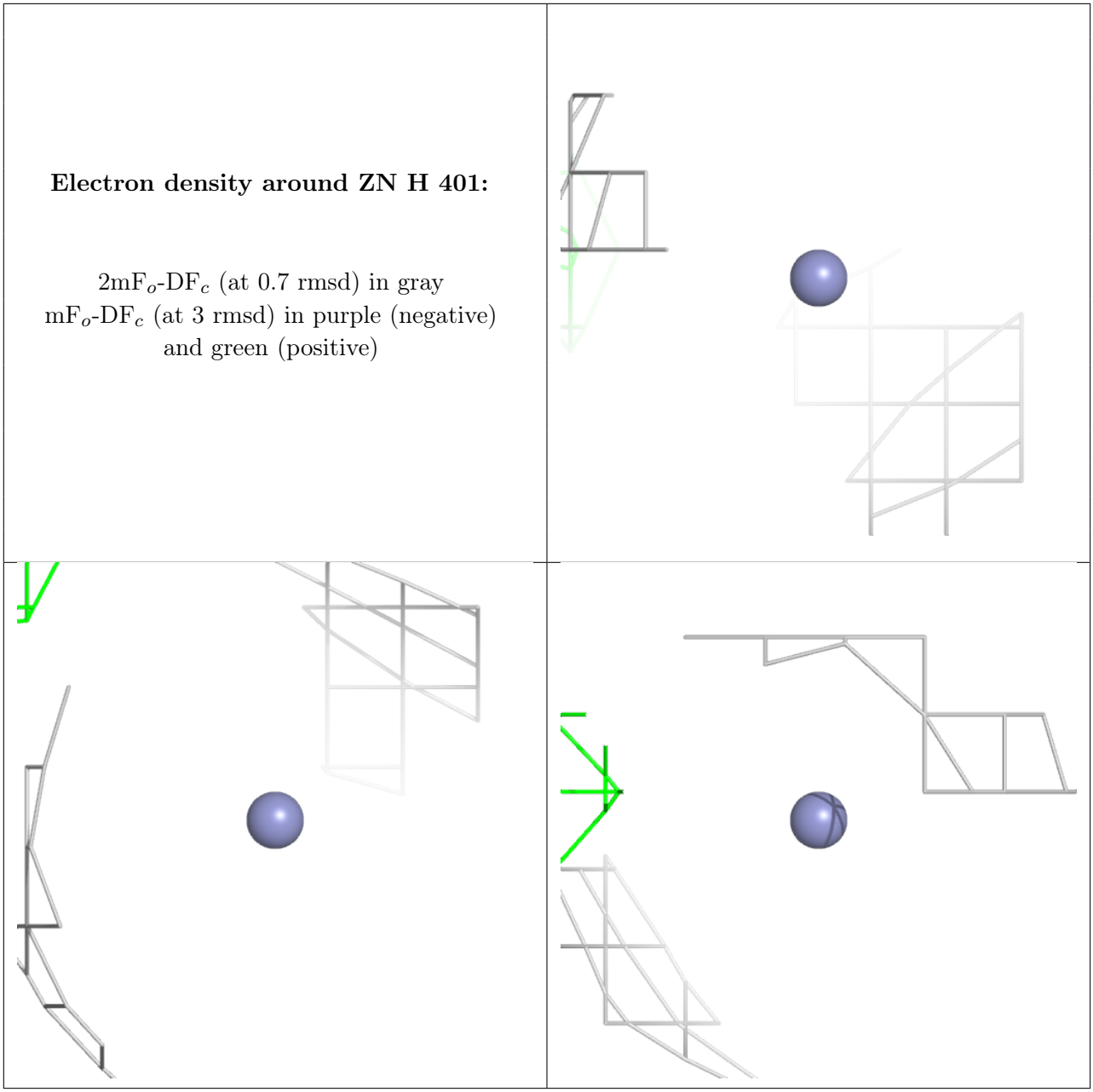
Electron density around CA F 402:

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



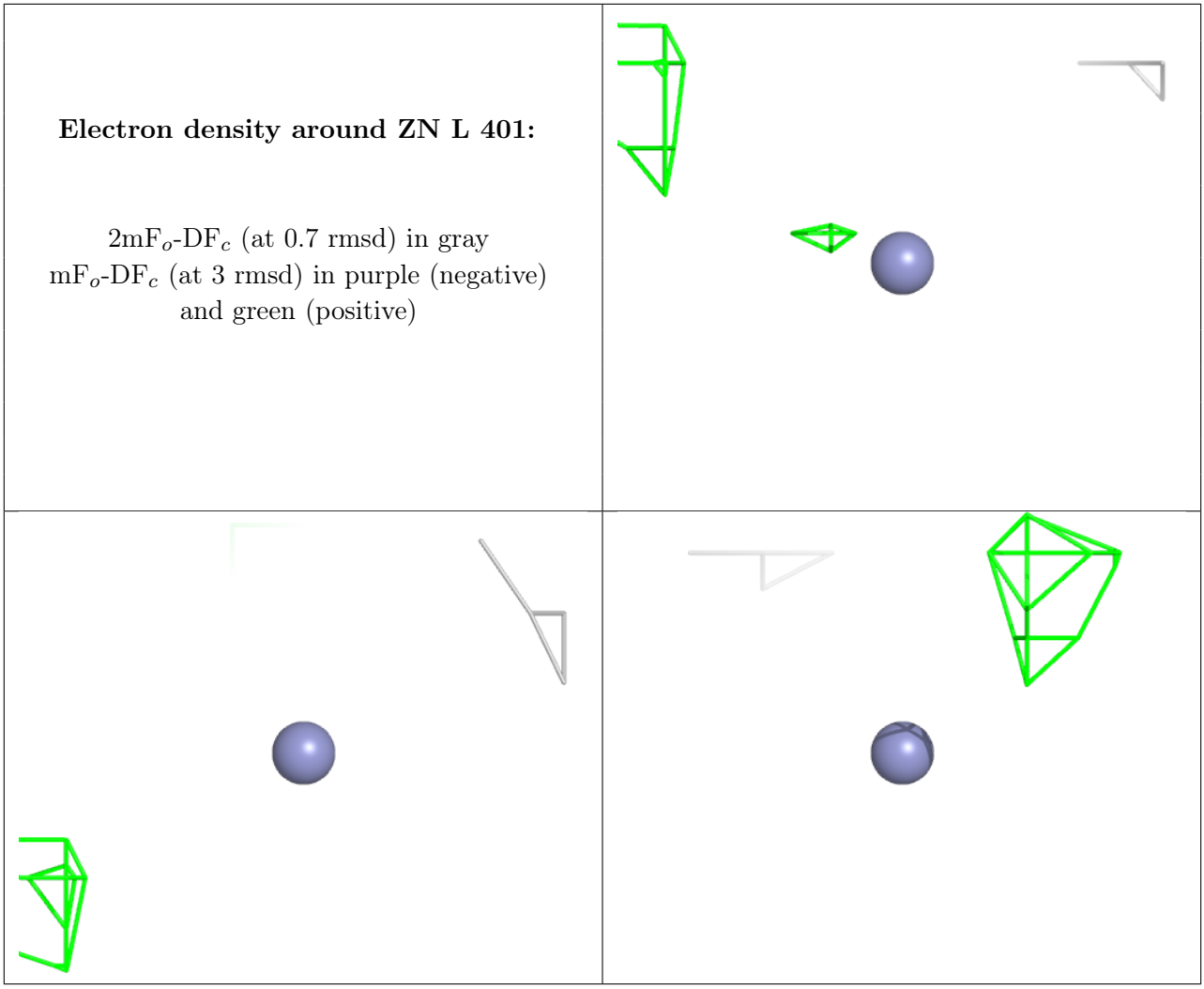
Electron density around ZN H 401:

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



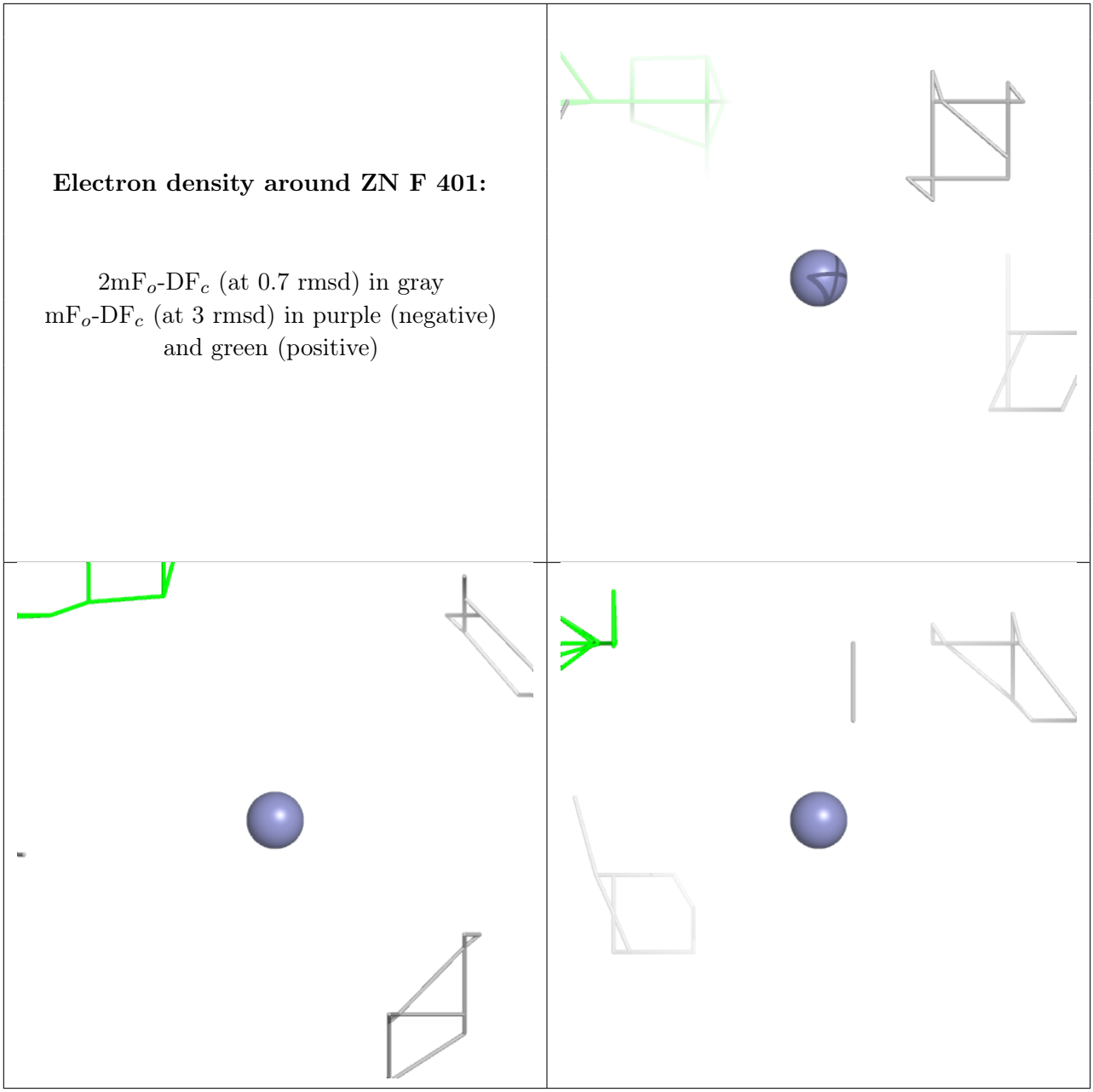
Electron density around ZN L 401:

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



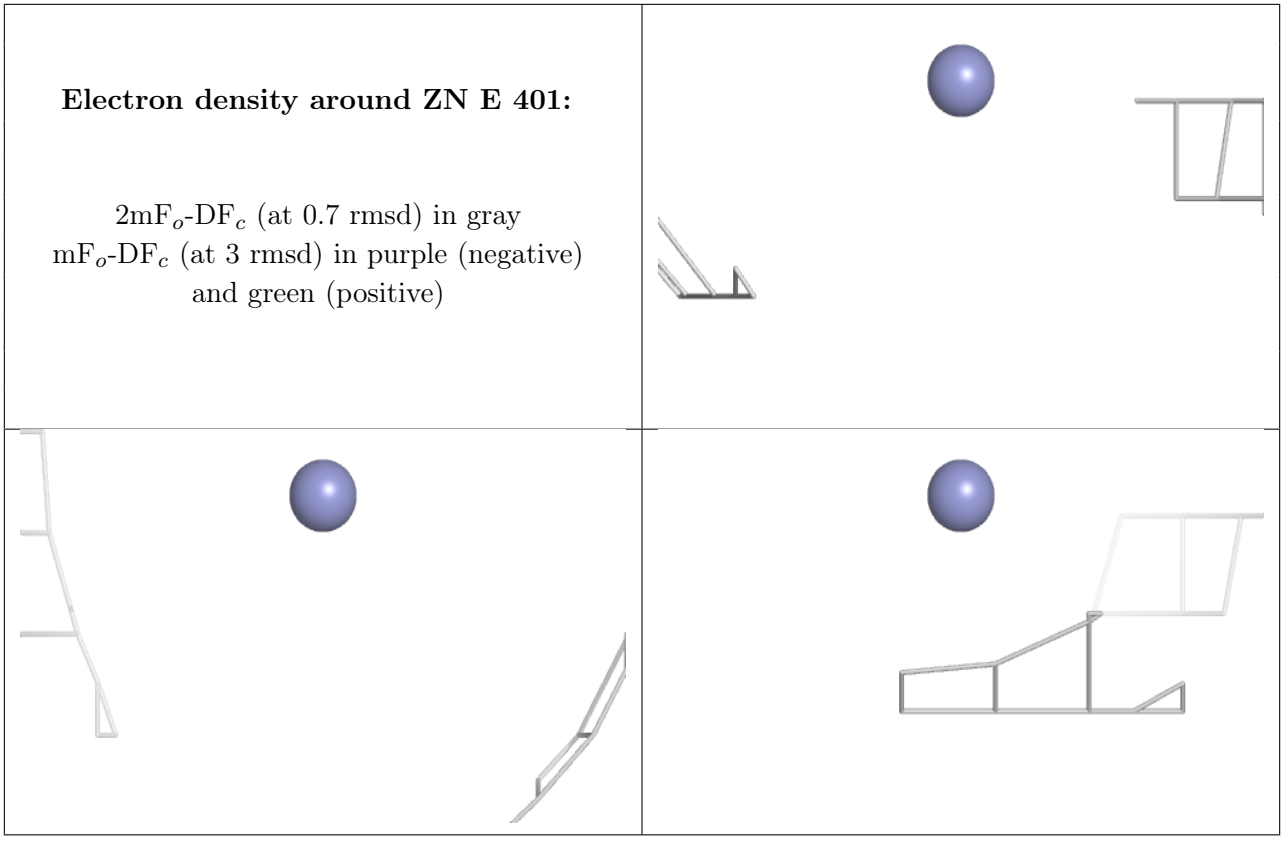
Electron density around ZN F 401:

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



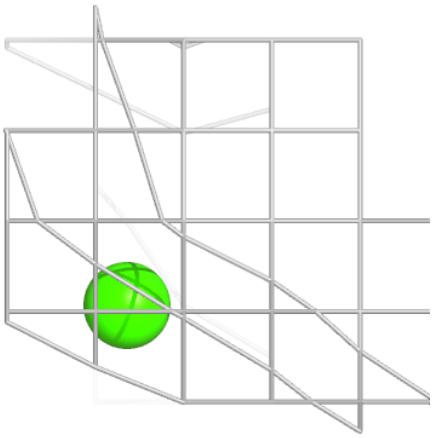
Electron density around ZN E 401:

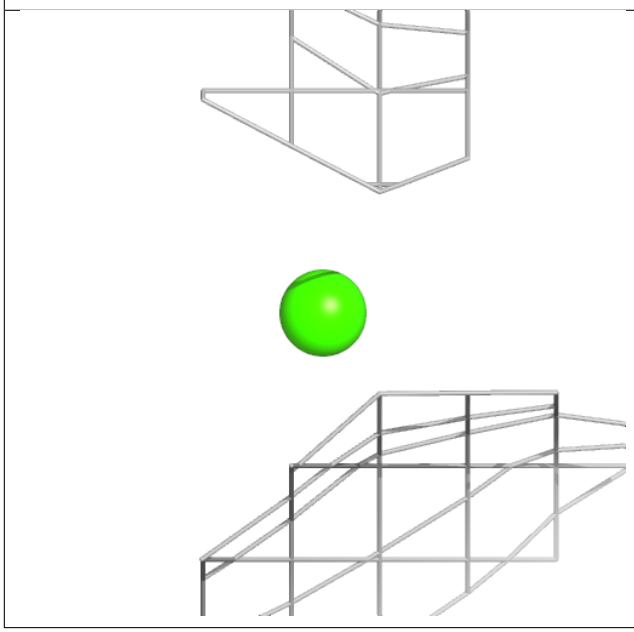
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

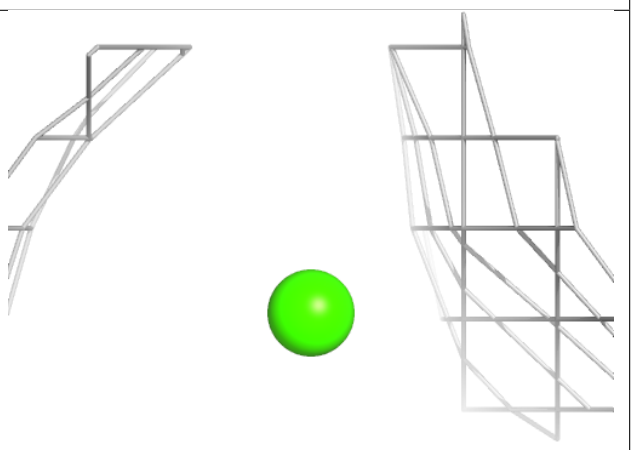


Electron density around CA A 402:

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

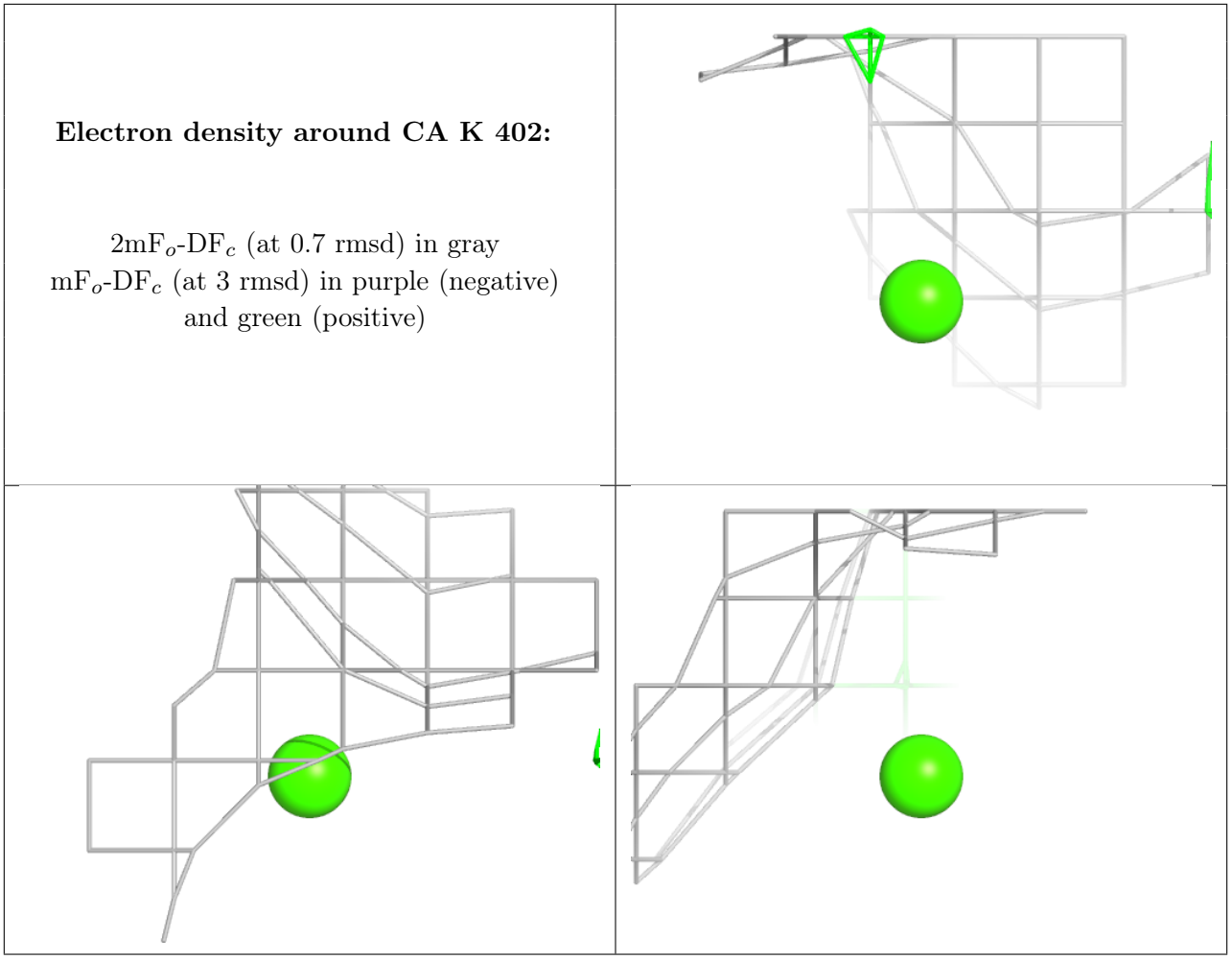






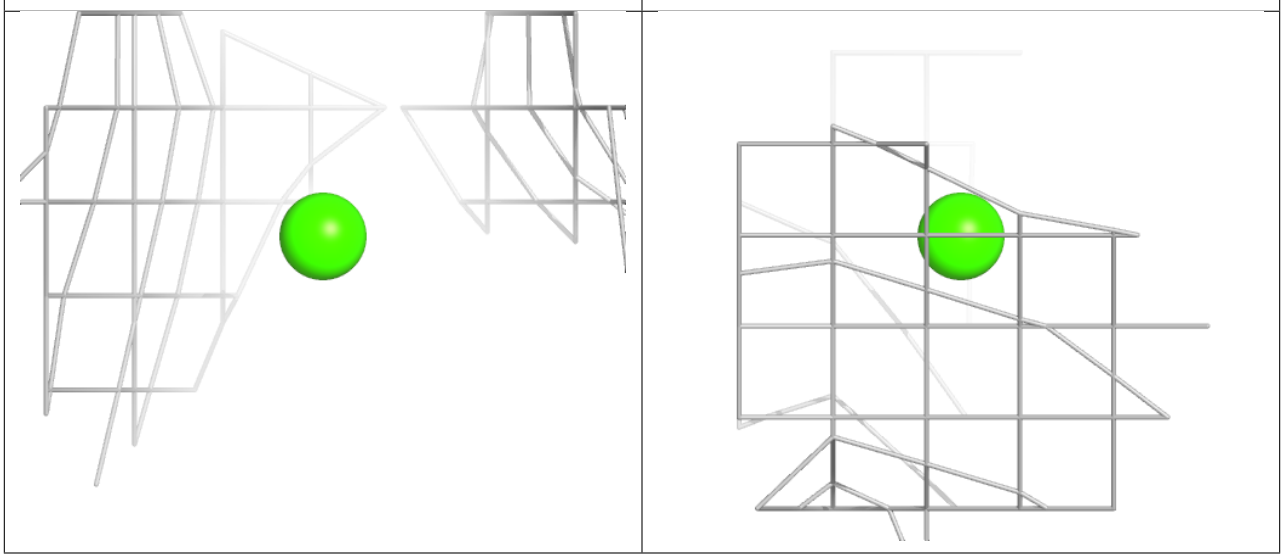
Electron density around CA K 402:

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



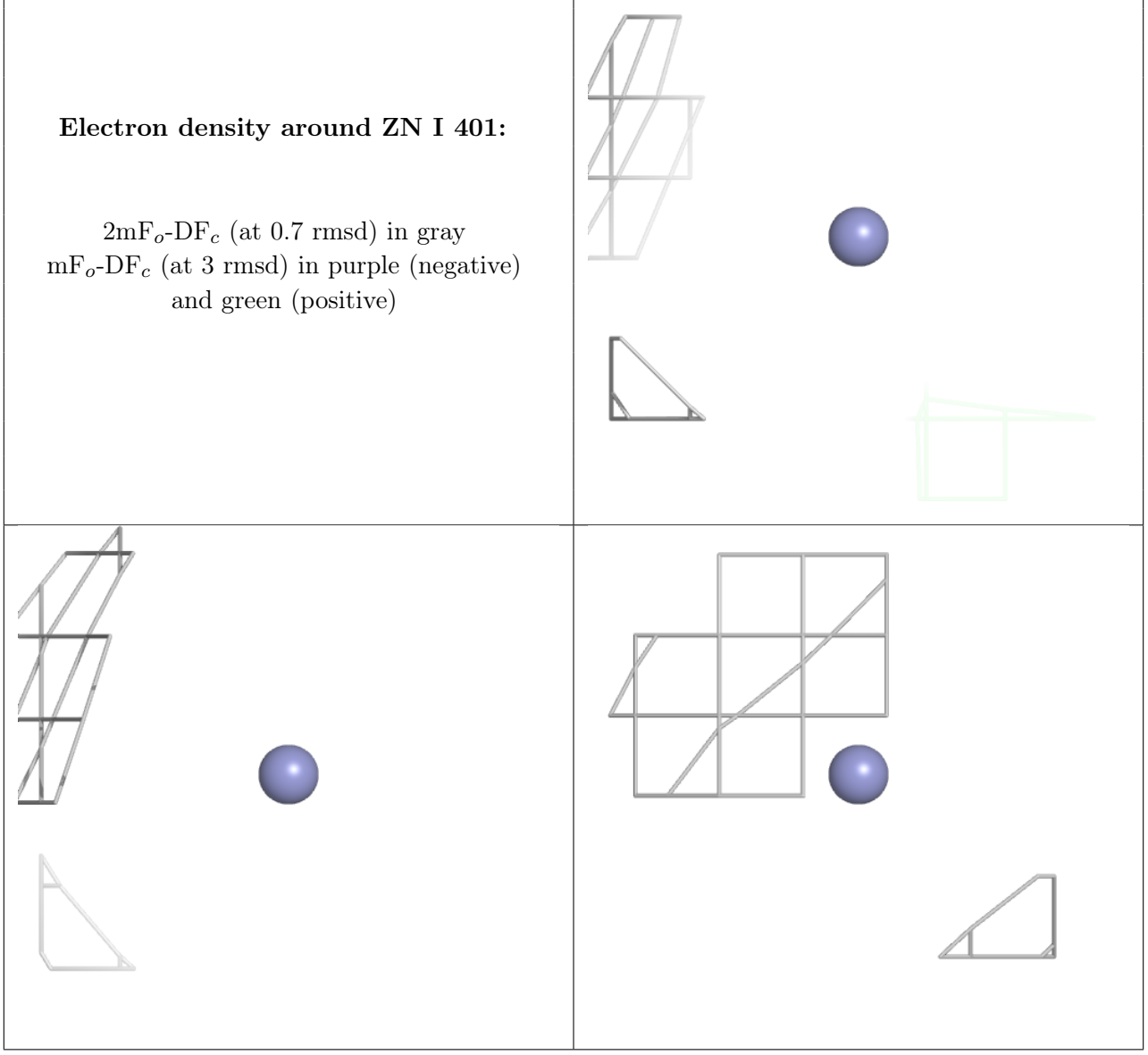
Electron density around CA H 402:

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



Electron density around ZN I 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 ZN K 401:

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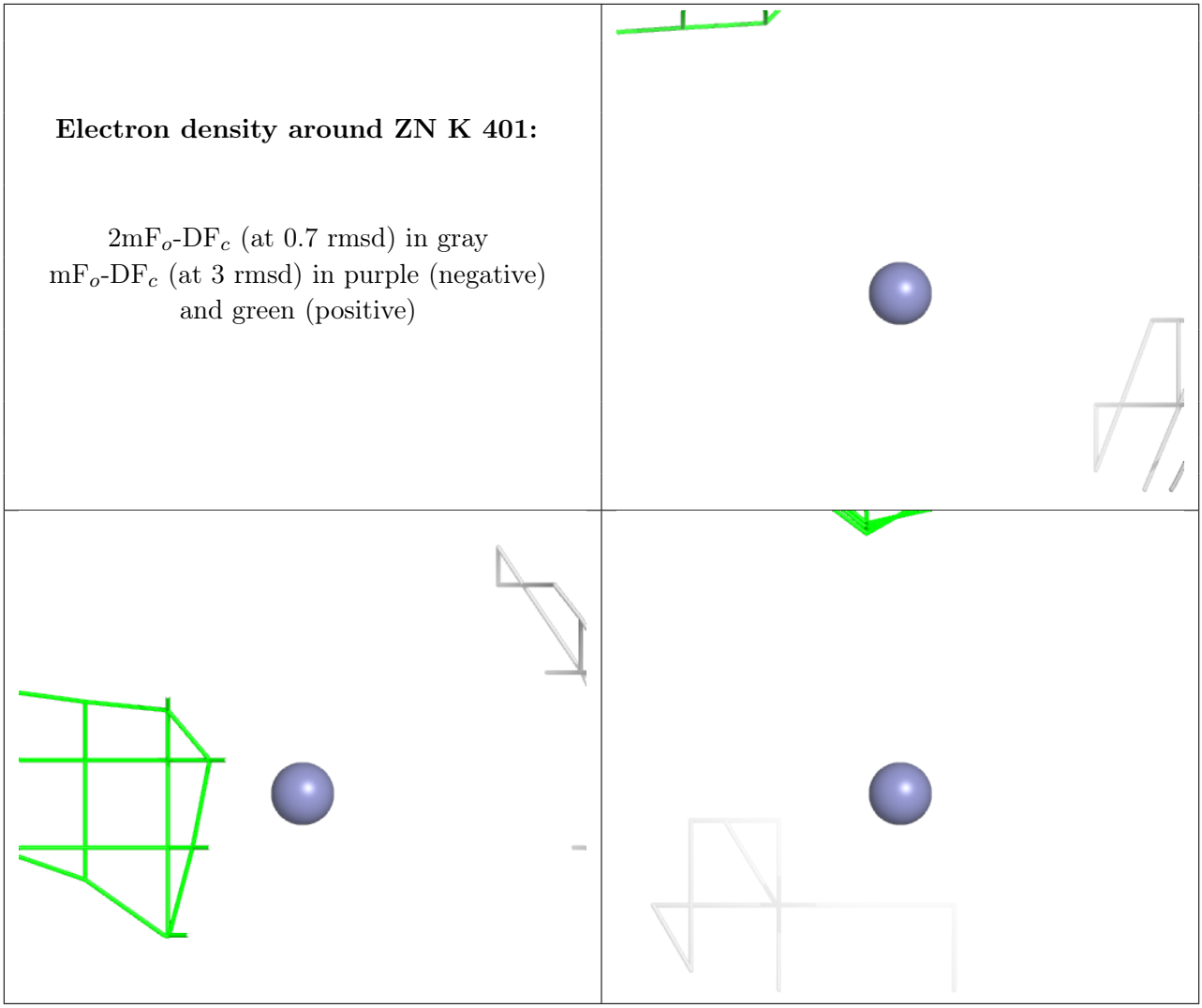
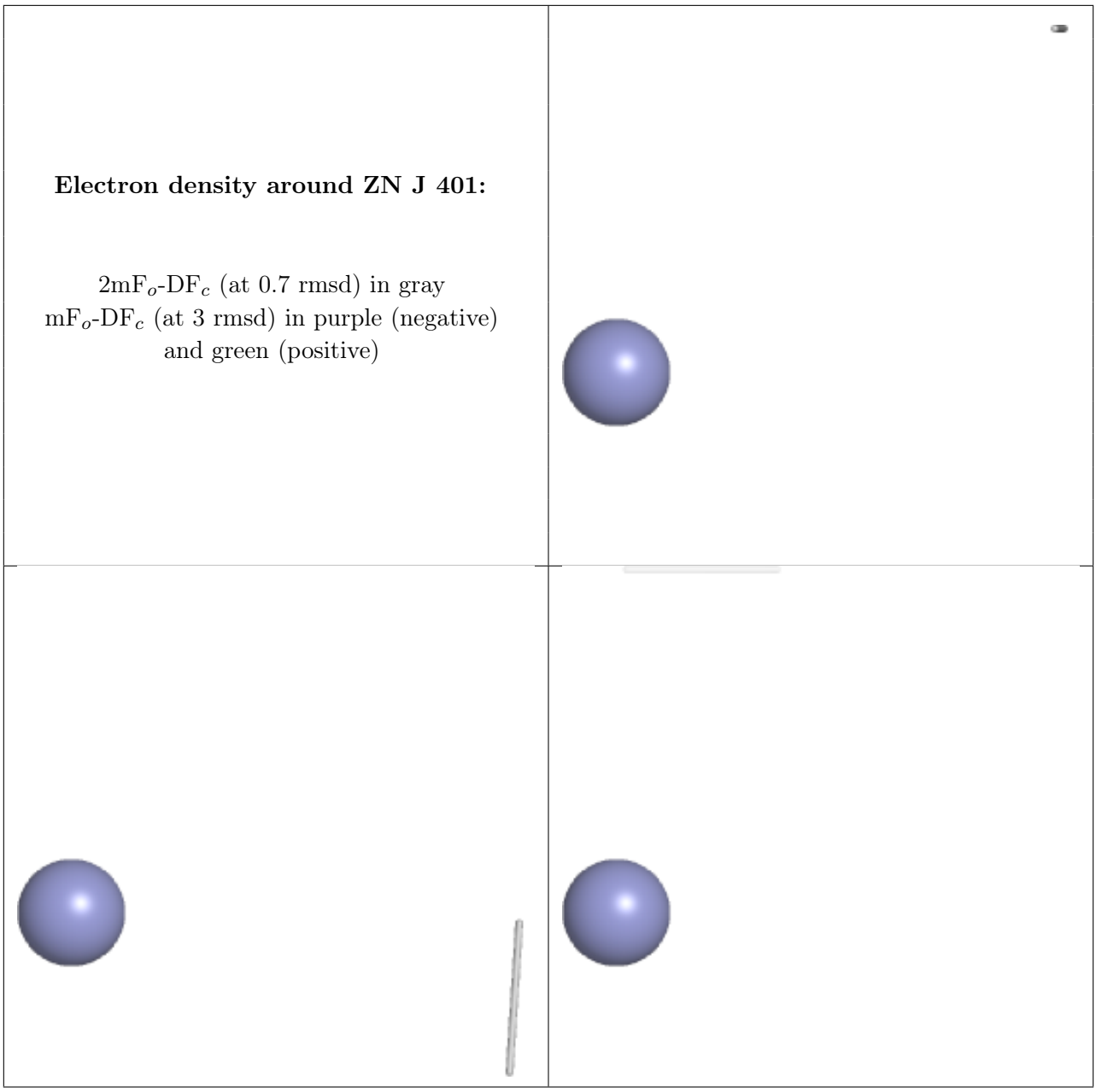
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



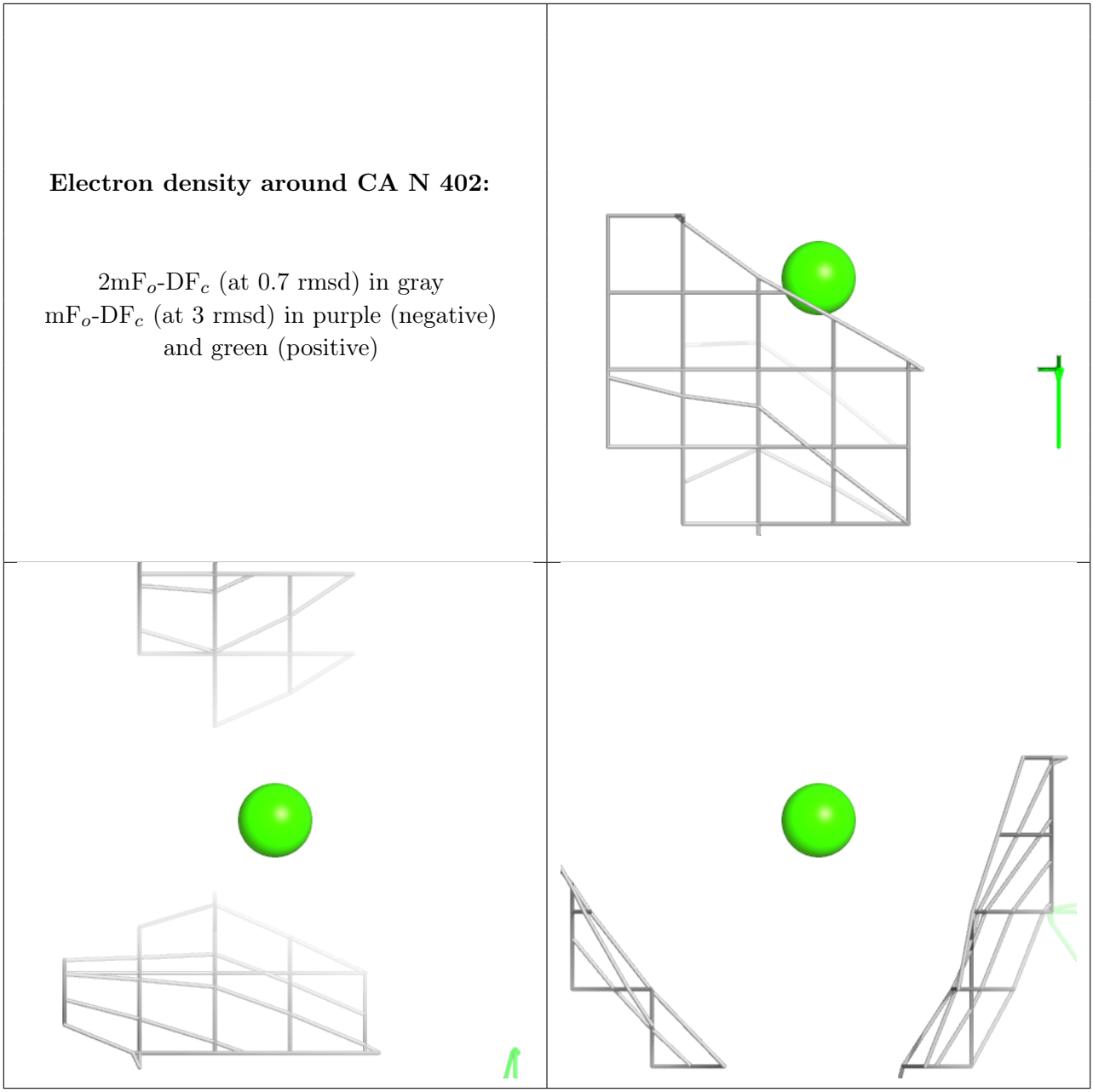
Electron density around ZN J 401:

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



Electron density around CA N 402:

$2mF_o$-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.