W O R L D W I D E

wwPDB

P R O T E I N   D A T A   B A N K

wwPDB X-ray Structure Validation Summary Report (i)

Oct 7, 2023 – 03:34 PM EDT

PDB ID	:	6DKC
Title	:	Yeast Ddi2 Cyanamide Hydratase, T157V mutant, apo structure
Authors	:	Moore, S.A.; Xiao, W.; Li, J.
Deposited on	:	2018-05-29
Resolution	:	2.90 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
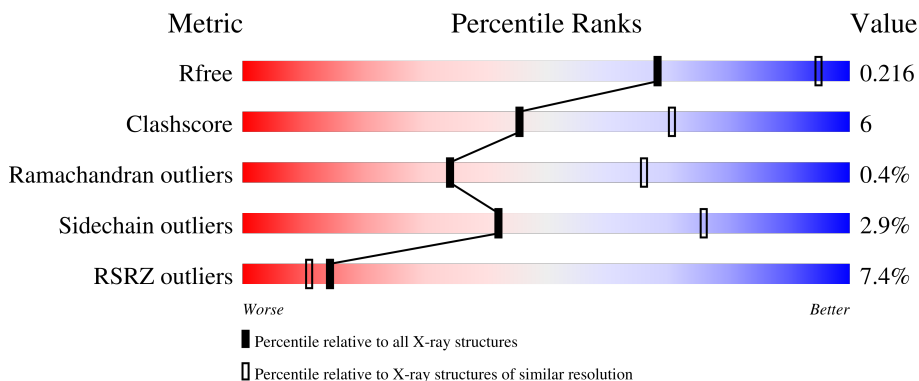http://www.wwpdb.org/validation/2017/FAQs#types.

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1   Overall quality at a glance ⓘ

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

The reported resolution of this entry is 2.90 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.
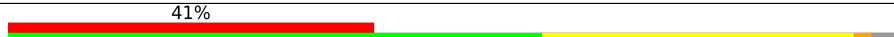
Metric	Percentile Ranks	Value
Rfree		0.216
Clashscore		6
Ramachandran outliers		0.4%
Sidechain outliers		2.9%
RSRZ outliers		7.4%

Worse   *Better*

▌Percentile relative to all X-ray structures

▯Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	1957 (2.90-2.90)
Clashscore	141614	2172 (2.90-2.90)
Ramachandran outliers	138981	2115 (2.90-2.90)
Sidechain outliers	138945	2117 (2.90-2.90)
RSRZ outliers	127900	1906 (2.90-2.90)

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	234	87% 10% • •
1	B	234	90% 7% • •
1	C	234	87% 10% •
1	D	234	85% 11% • •
1	E	234	90% 7% •

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Mol	Chain	Length	Quality of chain
1	F	234	91% 7%
1	G	234	% 88% 9%
1	H	234	22% 76% 20%
1	I	234	41% 60% 35%

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
3	SO4	G	302	-	-	X	-

2   Entry composition ⓘ

There are 4 unique types of molecules in this entry. The entry contains 32430 atoms, of which 15869 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 DNA damage-inducible protein.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	230	Total	C	H	N	O	S	0	0	0
			3548	1140	1757	306	339	6			
1	B	230	Total	C	H	N	O	S	0	0	0
			3548	1140	1757	306	339	6			
1	C	229	Total	C	H	N	O	S	0	0	0
			3578	1147	1774	309	342	6			
1	D	229	Total	C	H	N	O	S	0	0	0
			3574	1147	1770	309	342	6			
1	E	229	Total	C	H	N	O	S	0	0	0
			3574	1147	1770	309	342	6			
1	F	232	Total	C	H	N	O	S	0	0	0
			3595	1153	1783	311	342	6			
1	G	229	Total	C	H	N	O	S	0	0	0
			3554	1140	1762	308	338	6			
1	H	227	Total	C	H	N	O	S	0	0	0
			3512	1128	1741	303	335	5			
1	I	226	Total	C	H	N	O	S	0	0	0
			3534	1132	1755	306	335	6			

There are 81 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-7	GLY	-	expression tag	UNP A7A1Y4
A	-6	PRO	-	expression tag	UNP A7A1Y4
A	-5	LEU	-	expression tag	UNP A7A1Y4
A	-4	GLY	-	expression tag	UNP A7A1Y4
A	-3	SER	-	expression tag	UNP A7A1Y4
A	-2	PRO	-	expression tag	UNP A7A1Y4
A	-1	GLU	-	expression tag	UNP A7A1Y4
A	0	PHE	-	expression tag	UNP A7A1Y4
A	157	VAL	THR	engineered mutation	UNP A7A1Y4
B	-7	GLY	-	expression tag	UNP A7A1Y4
B	-6	PRO	-	expression tag	UNP A7A1Y4

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Chain	Residue	Modelled	Actual	Comment	Reference
B	-5	LEU	-	expression tag	UNP A7A1Y4
B	-4	GLY	-	expression tag	UNP A7A1Y4
B	-3	SER	-	expression tag	UNP A7A1Y4
B	-2	PRO	-	expression tag	UNP A7A1Y4
B	-1	GLU	-	expression tag	UNP A7A1Y4
B	0	PHE	-	expression tag	UNP A7A1Y4
B	157	VAL	THR	engineered mutation	UNP A7A1Y4
C	-7	GLY	-	expression tag	UNP A7A1Y4
C	-6	PRO	-	expression tag	UNP A7A1Y4
C	-5	LEU	-	expression tag	UNP A7A1Y4
C	-4	GLY	-	expression tag	UNP A7A1Y4
C	-3	SER	-	expression tag	UNP A7A1Y4
C	-2	PRO	-	expression tag	UNP A7A1Y4
C	-1	GLU	-	expression tag	UNP A7A1Y4
C	0	PHE	-	expression tag	UNP A7A1Y4
C	157	VAL	THR	engineered mutation	UNP A7A1Y4
D	-7	GLY	-	expression tag	UNP A7A1Y4
D	-6	PRO	-	expression tag	UNP A7A1Y4
D	-5	LEU	-	expression tag	UNP A7A1Y4
D	-4	GLY	-	expression tag	UNP A7A1Y4
D	-3	SER	-	expression tag	UNP A7A1Y4
D	-2	PRO	-	expression tag	UNP A7A1Y4
D	-1	GLU	-	expression tag	UNP A7A1Y4
D	0	PHE	-	expression tag	UNP A7A1Y4
D	157	VAL	THR	engineered mutation	UNP A7A1Y4
E	-7	GLY	-	expression tag	UNP A7A1Y4
E	-6	PRO	-	expression tag	UNP A7A1Y4
E	-5	LEU	-	expression tag	UNP A7A1Y4
E	-4	GLY	-	expression tag	UNP A7A1Y4
E	-3	SER	-	expression tag	UNP A7A1Y4
E	-2	PRO	-	expression tag	UNP A7A1Y4
E	-1	GLU	-	expression tag	UNP A7A1Y4
E	0	PHE	-	expression tag	UNP A7A1Y4
E	157	VAL	THR	engineered mutation	UNP A7A1Y4
F	-7	GLY	-	expression tag	UNP A7A1Y4
F	-6	PRO	-	expression tag	UNP A7A1Y4
F	-5	LEU	-	expression tag	UNP A7A1Y4
F	-4	GLY	-	expression tag	UNP A7A1Y4
F	-3	SER	-	expression tag	UNP A7A1Y4
F	-2	PRO	-	expression tag	UNP A7A1Y4
F	-1	GLU	-	expression tag	UNP A7A1Y4
F	0	PHE	-	expression tag	UNP A7A1Y4

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Chain	Residue	Modelled	Actual	Comment	Reference
F	157	VAL	THR	engineered mutation	UNP A7A1Y4
G	-7	GLY	-	expression tag	UNP A7A1Y4
G	-6	PRO	-	expression tag	UNP A7A1Y4
G	-5	LEU	-	expression tag	UNP A7A1Y4
G	-4	GLY	-	expression tag	UNP A7A1Y4
G	-3	SER	-	expression tag	UNP A7A1Y4
G	-2	PRO	-	expression tag	UNP A7A1Y4
G	-1	GLU	-	expression tag	UNP A7A1Y4
G	0	PHE	-	expression tag	UNP A7A1Y4
G	157	VAL	THR	engineered mutation	UNP A7A1Y4
H	-7	GLY	-	expression tag	UNP A7A1Y4
H	-6	PRO	-	expression tag	UNP A7A1Y4
H	-5	LEU	-	expression tag	UNP A7A1Y4
H	-4	GLY	-	expression tag	UNP A7A1Y4
H	-3	SER	-	expression tag	UNP A7A1Y4
H	-2	PRO	-	expression tag	UNP A7A1Y4
H	-1	GLU	-	expression tag	UNP A7A1Y4
H	0	PHE	-	expression tag	UNP A7A1Y4
H	157	VAL	THR	engineered mutation	UNP A7A1Y4
I	-7	GLY	-	expression tag	UNP A7A1Y4
I	-6	PRO	-	expression tag	UNP A7A1Y4
I	-5	LEU	-	expression tag	UNP A7A1Y4
I	-4	GLY	-	expression tag	UNP A7A1Y4
I	-3	SER	-	expression tag	UNP A7A1Y4
I	-2	PRO	-	expression tag	UNP A7A1Y4
I	-1	GLU	-	expression tag	UNP A7A1Y4
I	0	PHE	-	expression tag	UNP A7A1Y4
I	157	VAL	THR	engineered mutation	UNP A7A1Y4

- 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 1	Zn 1	0	0
2	B	1	Total 1	Zn 1	0	0
2	C	1	Total 1	Zn 1	0	0
2	D	1	Total 1	Zn 1	0	0
2	E	1	Total 1	Zn 1	0	0

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	F	1	Total 1	Zn 1	0	0
2	G	1	Total 1	Zn 1	0	0
2	H	1	Total 1	Zn 1	0	0
2	I	1	Total 1	Zn 1	0	0

- Molecule 3 is SULFATE ION (three-letter code: SO4) (formula: O_4S).
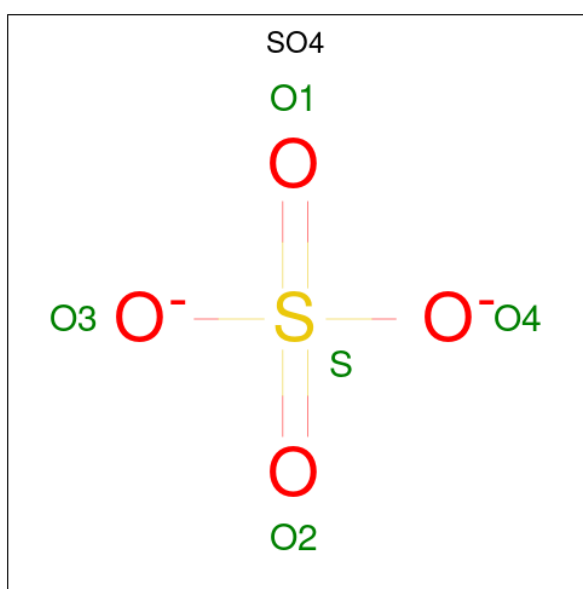
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total 5	O 4	S 1	0	0
3	A	1	Total 5	O 4	S 1	0	0
3	A	1	Total 5	O 4	S 1	0	0
3	B	1	Total 5	O 4	S 1	0	0
3	B	1	Total 5	O 4	S 1	0	0
3	B	1	Total 5	O 4	S 1	0	0
3	B	1	Total 5	O 4	S 1	0	0

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	B	1	Total 5	O 4	S 1	0	0
3	C	1	Total 5	O 4	S 1	0	0
3	C	1	Total 5	O 4	S 1	0	0
3	C	1	Total 5	O 4	S 1	0	0
3	C	1	Total 5	O 4	S 1	0	0
3	C	1	Total 5	O 4	S 1	0	0
3	C	1	Total 5	O 4	S 1	0	0
3	D	1	Total 5	O 4	S 1	0	0
3	D	1	Total 5	O 4	S 1	0	0
3	D	1	Total 5	O 4	S 1	0	0
3	D	1	Total 5	O 4	S 1	0	0
3	D	1	Total 5	O 4	S 1	0	0
3	D	1	Total 5	O 4	S 1	0	0
3	D	1	Total 5	O 4	S 1	0	0
3	E	1	Total 5	O 4	S 1	0	0
3	E	1	Total 5	O 4	S 1	0	0
3	E	1	Total 5	O 4	S 1	0	0
3	E	1	Total 5	O 4	S 1	0	0
3	E	1	Total 5	O 4	S 1	0	0
3	E	1	Total 5	O 4	S 1	0	0
3	F	1	Total 5	O 4	S 1	0	0

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	F	1	Total 5	O 4	S 1	0	0
3	F	1	Total 5	O 4	S 1	0	0
3	G	1	Total 5	O 4	S 1	0	0
3	G	1	Total 5	O 4	S 1	0	0

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	36	Total 36	O 36	0	0
4	B	34	Total 34	O 34	0	0
4	C	48	Total 48	O 48	0	0
4	D	36	Total 36	O 36	0	0
4	E	45	Total 45	O 45	0	0
4	F	28	Total 28	O 28	0	0
4	G	17	Total 17	O 17	0	0

3   Residue-property plots ⓘ

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: DNA damage-inducible protein

Chain A:

- Molecule 1: DNA damage-inducible protein

Chain B:
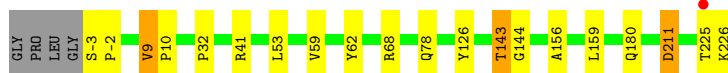
- Molecule 1: DNA damage-inducible protein

Chain C:

- Molecule 1: DNA damage-inducible protein

Chain D:

- Molecule 1: DNA damage-inducible protein

Chain E:

- Molecule 1: DNA damage-inducible protein

Chain F:

91%   7%   •

GLY P-6 S-3 M1 S2 F6 P32 N33 S34 R41 A50 P51 D75 E79 R113 Y126 R136 D139 W186 K201 D211 T225 LYS
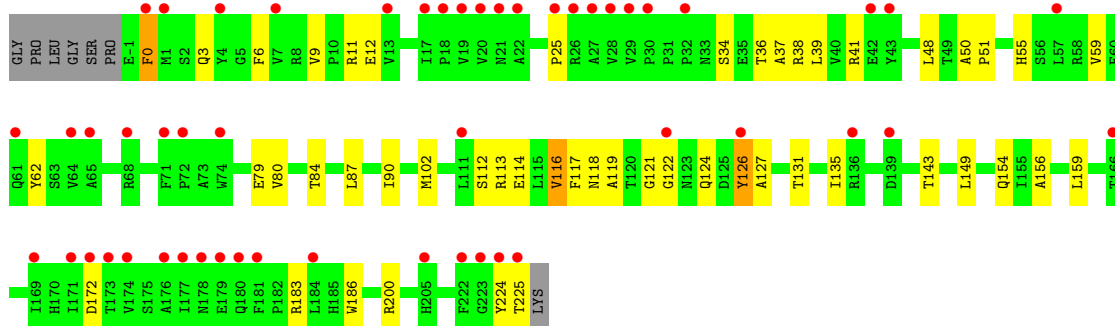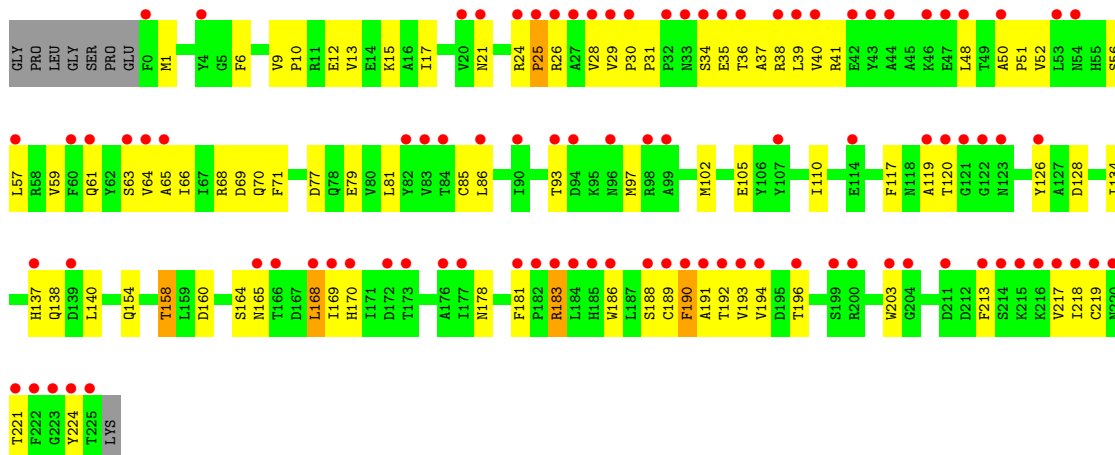
• Molecule 1: DNA damage-inducible protein

%

Chain G:

88%   9%   ••

GLY PRO LEU GLY S-3 M1 S2 V7 R8 V9 P10 R11 E12 V13 P18 E35 L39 V59 Y62 R68 R98 M102 Y126 A156 L159 T166 W186 L187 R200 N220 T221 F222 T225 LYS

• Molecule 1: DNA damage-inducible protein

22%

Chain H:

76%   20%   ••

GLY PRO LEU GLY SER PRO E-1 F0 M1 S2 Q3 Y4 G5 F6 V7 R8 V9 P10 R11 E12 V13 I17 P18 V19 V20 N21 A22 P25 R26 A27 V28 V29 P30 P31 P32 N33 S34 E35 T36 A37 R38 L39 V40 R41 E42 Y43 L48 T49 A50 P51 H55 S56 L57 R58 V59 F60

Q61 Y62 S63 V64 A65 R68 F71 P72 A73 W74 E79 V80 T84 L87 I90 M102 L111 S112 R113 E114 L115 V116 F117 N118 A119 T120 G121 G122 N123 Q124 D125 Y126 A127 T131 I135 R136 D139 T143 L149 Q154 I155 A156 L159 T166

I169 H170 I171 D172 T173 V174 S175 A176 I177 N178 E179 Q180 F181 P182 R183 L184 H185 W186 R200 H205 F222 G223 Y224 T225 LYS

• Molecule 1: DNA damage-inducible protein

41%

Chain I:

60%   35%   ••

GLY PRO LEU GLY SER PRO GLU F0 M1 Y4 G5 F6 V9 P10 R11 E12 V13 E14 K15 A16 I17 V20 N21 R24 P25 R26 A27 V28 V29 P30 P31 P32 N33 S34 E35 T36 A37 R38 L39 V40 R41 E42 Y43 A44 A45 K46 E47 L48 T49 A50 P51 V52 L53 N54 H55 S56

L57 R58 V59 F60 Q61 Y62 S63 V64 A65 I66 I67 R68 D69 Q70 F71 D77 Q78 E79 V80 L81 Y82 V83 T84 C85 L86 I90 T93 D94 K95 N96 M97 R98 A99 M102 E105 Y106 Y107 I110 E114 F117 N118 A119 T120 G121 G122 N123 Y126 A127 D128 I134

H137 Q138 D139 L140 Q154 T158 L159 D160 S164 N165 T166 D167 L168 I169 H170 I171 D172 T173 A176 I177 N178 F181 P182 R183 L184 H185 W186 L187 S188 C189 F190 A191 T192 V193 V194 D195 T196 S199 R200 W203 G204 D211 D212 F213 S214 K215 K216 V217 I218 C219 N220

T221 F222 G223 Y224 T225 LYS

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 3 2 1	Depositor
Cell constants a, b, c, α, β, γ	263.61Å 263.61Å 119.03Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	39.30 – 2.90 39.32 – 2.90	Depositor EDS
% Data completeness (in resolution range)	97.0 (39.30-2.90) 97.0 (39.32-2.90)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	3.07 (at 2.90Å)	Xtriage
Refinement program	PHENIX (1.13_2998)	Depositor
R, R_{free}	0.193 , 0.215 0.193 , 0.216	Depositor DCC
R_{free} test set	2578 reflections (2.53%)	wwPDB-VP
Wilson B-factor (Å^2)	53.4	Xtriage
Anisotropy	0.513	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.39 , 55.2	EDS
L-test for twinning[2]	$< |L| > = 0.50, < L^2 > = 0.34$	Xtriage
Estimated twinning fraction	0.011 for -h,-k,l	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	32430	wwPDB-VP
Average B, all atoms (Å^2)	76.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.40% of the height of the origin peak. No significant pseudotranslation is detected.*

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[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: ZN, SO4

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	0.41	1/1833 (0.1%)	0.54	0/2506
1	B	0.35	0/1833	0.55	0/2506
1	C	0.39	0/1846	0.57	0/2520
1	D	0.37	1/1846 (0.1%)	0.53	0/2520
1	E	0.39	0/1846	0.59	1/2520 (0.0%)
1	F	0.35	0/1855	0.52	0/2534
1	G	0.34	0/1834	0.53	0/2506
1	H	0.33	0/1812	0.54	0/2476
1	I	0.37	0/1820	0.58	0/2484
All	All	0.37	2/16525 (0.0%)	0.55	1/22572 (0.0%)

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	0	1
1	D	0	1
1	H	0	1
All	All	0	3

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	12	GLU	CD-OE1	-6.24	1.18	1.25
1	D	101	LYS	CE-NZ	-5.23	1.35	1.49

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	E	1	MET	CA-CB-CG	5.76	123.10	113.30

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	-3	SER	Peptide
1	D	-3	SER	Peptide
1	H	38	ARG	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	1791	1757	1746	15	1
1	B	1791	1757	1746	12	0
1	C	1804	1774	1774	13	0
1	D	1804	1770	1774	16	0
1	E	1804	1770	1774	14	0
1	F	1812	1783	1779	11	0
1	G	1792	1762	1755	19	0
1	H	1771	1741	1733	35	1
1	I	1779	1755	1755	82	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
3	A	15	0	0	1	0
3	B	25	0	0	1	0
3	C	30	0	0	1	0
3	D	35	0	0	1	0
3	E	30	0	0	3	0
3	F	15	0	0	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	G	10	0	0	4	0
4	A	36	0	0	1	0
4	B	34	0	0	0	0
4	C	48	0	0	1	0
4	D	36	0	0	1	0
4	E	45	0	0	0	0
4	F	28	0	0	1	0
4	G	17	0	0	1	0
All	All	16561	15869	15836	205	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 6.

The worst 5 of 205 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:I:178:ASN:OD1	1:I:183:ARG:NH1	1.99	0.95
1:C:24:ARG:NH2	3:C:307:SO4:O1	2.01	0.93
1:I:190:PHE:HB3	1:I:217:VAL:HG11	1.52	0.89
1:F:2:SER:OG	1:F:75:ASP:OD2	1.94	0.85
1:E:2:SER:OG	1:E:75:ASP:OD2	1.98	0.80

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:A:82:TYR:OH	1:H:121:GLY:O[3_566]	1.83	0.37

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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	228/234 (97%)	222 (97%)	6 (3%)	0	100	100
1	B	228/234 (97%)	224 (98%)	4 (2%)	0	100	100
1	C	227/234 (97%)	223 (98%)	3 (1%)	1 (0%)	34	66
1	D	227/234 (97%)	224 (99%)	3 (1%)	0	100	100
1	E	227/234 (97%)	223 (98%)	4 (2%)	0	100	100
1	F	230/234 (98%)	224 (97%)	4 (2%)	2 (1%)	17	48
1	G	227/234 (97%)	223 (98%)	3 (1%)	1 (0%)	34	66
1	H	225/234 (96%)	214 (95%)	7 (3%)	4 (2%)	8	29
1	I	224/234 (96%)	216 (96%)	7 (3%)	1 (0%)	34	66
All	All	2043/2106 (97%)	1993 (98%)	41 (2%)	9 (0%)	34	66

5 of 9 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	-1	GLU
1	G	13	VAL
1	H	116	VAL
1	H	119	ALA
1	F	-3	SER

5.3.2 Protein sidechains ⓘ

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	194/202 (96%)	189 (97%)	5 (3%)	46	77
1	B	194/202 (96%)	187 (96%)	7 (4%)	35	69
1	C	198/202 (98%)	191 (96%)	7 (4%)	36	70
1	D	198/202 (98%)	190 (96%)	8 (4%)	31	65
1	E	198/202 (98%)	192 (97%)	6 (3%)	41	75
1	F	198/202 (98%)	195 (98%)	3 (2%)	65	87
1	G	195/202 (96%)	192 (98%)	3 (2%)	65	87

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	H	192/202 (95%)	187 (97%)	5 (3%)	46	77
1	I	195/202 (96%)	188 (96%)	7 (4%)	35	69
All	All	1762/1818 (97%)	1711 (97%)	51 (3%)	42	76

5 of 51 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	E	41	ARG
1	F	211	ASP
1	I	190	PHE
1	E	75	ASP
1	E	201	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	78	GLN
1	H	124	GLN
1	I	61	GLN
1	I	70	GLN
1	I	198	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 41 ligands modelled in this entry, 9 are monoatomic - leaving 32 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	SO4	C	306	-	4,4,4	0.17	0	6,6,6	0.17	0
3	SO4	C	305	-	4,4,4	0.12	0	6,6,6	0.31	0
3	SO4	B	305	-	4,4,4	0.16	0	6,6,6	0.15	0
3	SO4	A	302	-	4,4,4	0.13	0	6,6,6	0.12	0
3	SO4	C	302	-	4,4,4	0.22	0	6,6,6	0.22	0
3	SO4	D	308	-	4,4,4	0.19	0	6,6,6	0.20	0
3	SO4	B	304	-	4,4,4	0.13	0	6,6,6	0.16	0
3	SO4	F	304	-	4,4,4	0.10	0	6,6,6	0.09	0
3	SO4	G	302	-	4,4,4	0.19	0	6,6,6	0.18	0
3	SO4	D	304	-	4,4,4	0.13	0	6,6,6	0.22	0
3	SO4	B	306	-	4,4,4	0.06	0	6,6,6	0.24	0
3	SO4	D	303	-	4,4,4	0.16	0	6,6,6	0.13	0
3	SO4	D	307	-	4,4,4	0.14	0	6,6,6	0.14	0
3	SO4	D	305	-	4,4,4	0.15	0	6,6,6	0.15	0
3	SO4	F	303	-	4,4,4	0.14	0	6,6,6	0.24	0
3	SO4	B	301	-	4,4,4	0.16	0	6,6,6	0.16	0
3	SO4	E	307	-	4,4,4	0.12	0	6,6,6	0.40	0
3	SO4	E	306	-	4,4,4	0.19	0	6,6,6	0.19	0
3	SO4	E	305	-	4,4,4	0.20	0	6,6,6	0.37	0
3	SO4	E	302	-	4,4,4	0.17	0	6,6,6	0.12	0
3	SO4	E	304	-	4,4,4	0.18	0	6,6,6	0.19	0
3	SO4	E	303	-	4,4,4	0.20	0	6,6,6	0.25	0
3	SO4	C	307	-	4,4,4	0.16	0	6,6,6	0.12	0
3	SO4	D	306	-	4,4,4	0.14	0	6,6,6	0.16	0
3	SO4	C	304	-	4,4,4	0.12	0	6,6,6	0.12	0
3	SO4	C	303	-	4,4,4	0.18	0	6,6,6	0.17	0
3	SO4	A	304	-	4,4,4	0.07	0	6,6,6	0.19	0
3	SO4	B	303	-	4,4,4	0.10	0	6,6,6	0.12	0
3	SO4	A	303	-	4,4,4	0.15	0	6,6,6	0.29	0
3	SO4	F	301	-	4,4,4	0.11	0	6,6,6	0.19	0
3	SO4	G	303	-	4,4,4	0.16	0	6,6,6	0.18	0
3	SO4	D	301	-	4,4,4	0.20	0	6,6,6	0.17	0

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.

10 monomers are involved in 12 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	F	304	SO4	1	0
3	G	302	SO4	3	0
3	B	306	SO4	1	0
3	E	307	SO4	1	0
3	E	305	SO4	1	0
3	E	303	SO4	1	0
3	C	307	SO4	1	0
3	A	303	SO4	1	0
3	G	303	SO4	1	0
3	D	301	SO4	1	0

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, 95th 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(Å²)	Q<0.9
1	A	230/234 (98%)	-0.14	1 (0%)	92	93	40, 55, 81, 119	0
1	B	230/234 (98%)	-0.23	1 (0%)	92	93	33, 51, 73, 120	0
1	C	229/234 (97%)	-0.33	2 (0%)	84	84	30, 43, 67, 106	0
1	D	229/234 (97%)	-0.28	1 (0%)	92	93	34, 45, 67, 97	0
1	E	229/234 (97%)	-0.28	0	100	100	32, 43, 65, 132	0
1	F	232/234 (99%)	-0.16	0	100	100	36, 50, 79, 125	0
1	G	229/234 (97%)	-0.07	2 (0%)	84	84	42, 65, 88, 113	0
1	H	227/234 (97%)	1.09	51 (22%)	0	0	68, 114, 155, 180	0
1	I	226/234 (96%)	1.75	95 (42%)	0	0	89, 149, 188, 235	0
All	All	2061/2106 (97%)	0.15	153 (7%)	14	11	30, 54, 155, 235	0

The worst 5 of 153 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	I	177	ILE	6.3
1	I	90	ILE	5.9
1	H	28	VAL	5.4
1	I	57	LEU	5.2
1	I	225	THR	5.1

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

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

6.3   Carbohydrates ⓘ

There are no monosaccharides in this entry.

6.4 Ligands ⓘ

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, 95th 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	ZN	I	500	1/1	0.25	0.23	95,95,95,95	1
3	SO4	G	302	5/5	0.79	0.32	65,71,73,74	5
3	SO4	D	305	5/5	0.80	0.34	84,89,95,96	5
3	SO4	C	305	5/5	0.81	0.37	68,68,76,78	5
3	SO4	B	305	5/5	0.84	0.44	104,106,109,113	5
3	SO4	D	306	5/5	0.85	0.35	73,81,82,86	5
3	SO4	B	304	5/5	0.87	0.34	47,55,57,60	5
3	SO4	B	306	5/5	0.87	0.28	78,81,83,84	5
3	SO4	D	303	5/5	0.90	0.24	95,97,99,101	0
3	SO4	D	308	5/5	0.90	0.18	76,79,82,82	5
3	SO4	E	306	5/5	0.90	0.44	59,63,63,65	5
3	SO4	B	303	5/5	0.90	0.26	79,86,91,92	5
3	SO4	C	304	5/5	0.91	0.22	84,87,88,92	5
3	SO4	A	303	5/5	0.91	0.27	55,55,56,61	5
3	SO4	C	307	5/5	0.91	0.14	65,73,77,79	5
3	SO4	D	301	5/5	0.92	0.19	85,90,92,94	0
3	SO4	E	303	5/5	0.92	0.24	43,44,47,47	5
3	SO4	C	302	5/5	0.93	0.23	38,41,42,43	5
3	SO4	A	304	5/5	0.93	0.23	42,51,55,56	5
3	SO4	B	301	5/5	0.93	0.16	82,89,97,98	0
3	SO4	F	304	5/5	0.93	0.23	52,53,58,59	5
3	SO4	A	302	5/5	0.93	0.23	67,73,74,79	5
2	ZN	G	301	1/1	0.94	0.05	69,69,69,69	1
2	ZN	H	500	1/1	0.94	0.14	100,100,100,100	1
3	SO4	F	303	5/5	0.94	0.20	71,72,74,77	5
3	SO4	D	307	5/5	0.94	0.14	67,70,70,71	5
3	SO4	C	306	5/5	0.94	0.23	66,70,74,74	5
3	SO4	G	303	5/5	0.94	0.26	59,63,66,66	5
3	SO4	E	305	5/5	0.95	0.20	43,49,53,53	5
3	SO4	E	304	5/5	0.96	0.14	51,52,56,57	5
3	SO4	D	304	5/5	0.96	0.24	76,79,81,86	0
3	SO4	C	303	5/5	0.96	0.18	43,56,59,62	5
3	SO4	F	301	5/5	0.96	0.13	53,57,62,62	5
3	SO4	E	302	5/5	0.97	0.15	64,66,69,71	5
2	ZN	B	302	1/1	0.97	0.11	59,59,59,59	1
2	ZN	C	301	1/1	0.98	0.10	44,44,44,44	1
2	ZN	D	302	1/1	0.98	0.10	58,58,58,58	1

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\mathring{A}^2$)	Q<0.9
2	ZN	E	301	1/1	0.98	0.11	53,53,53,53	1
2	ZN	A	301	1/1	0.98	0.10	51,51,51,51	1
3	SO4	E	307	5/5	0.98	0.17	38,47,49,51	5
2	ZN	F	302	1/1	0.99	0.18	57,57,57,57	1

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.
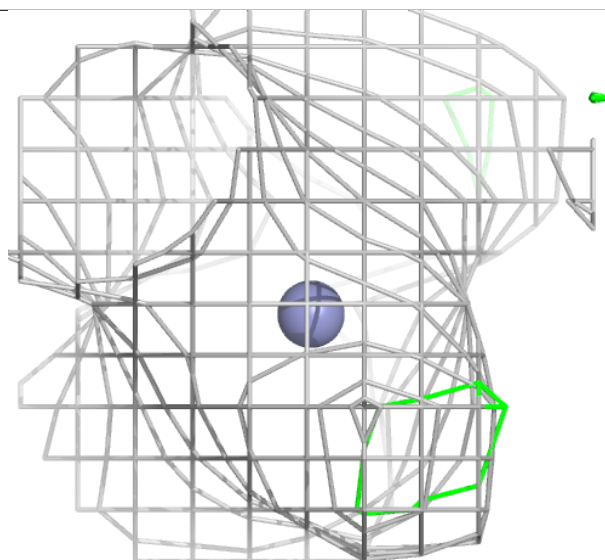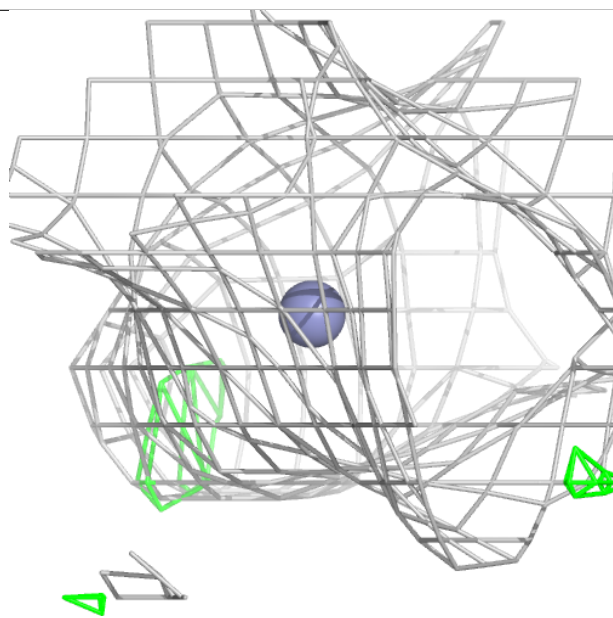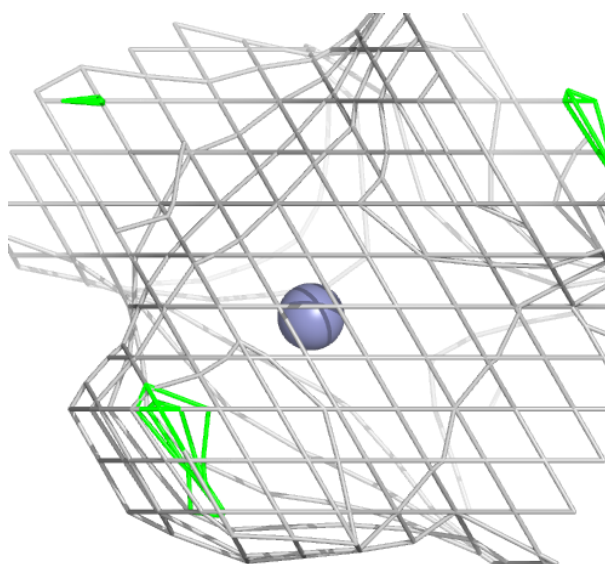

Electron density around ZN I 500:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)
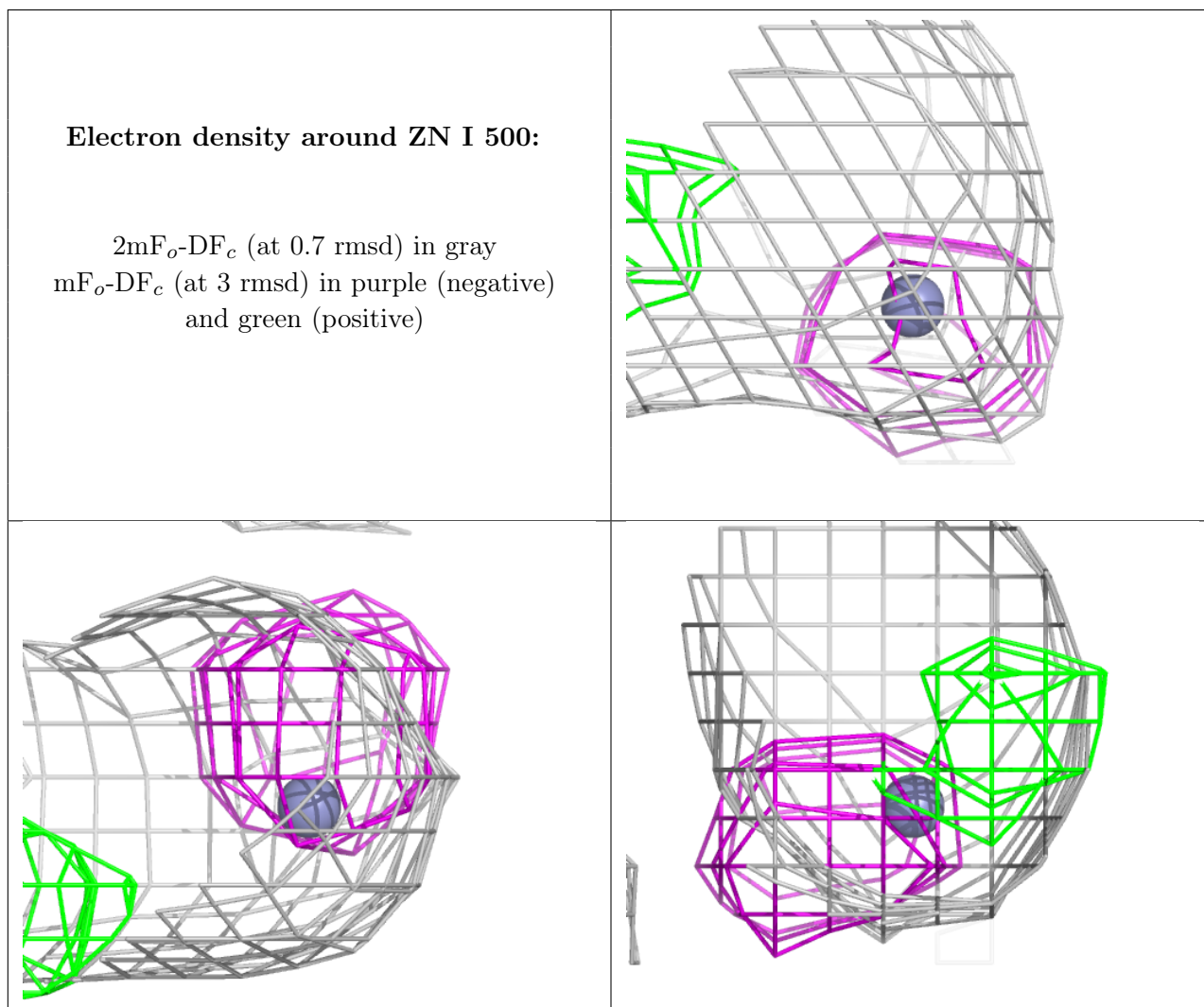
Electron density around ZN G 301:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
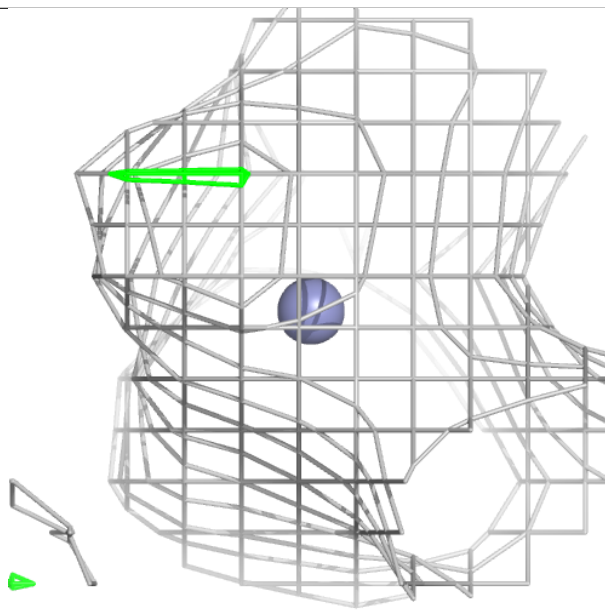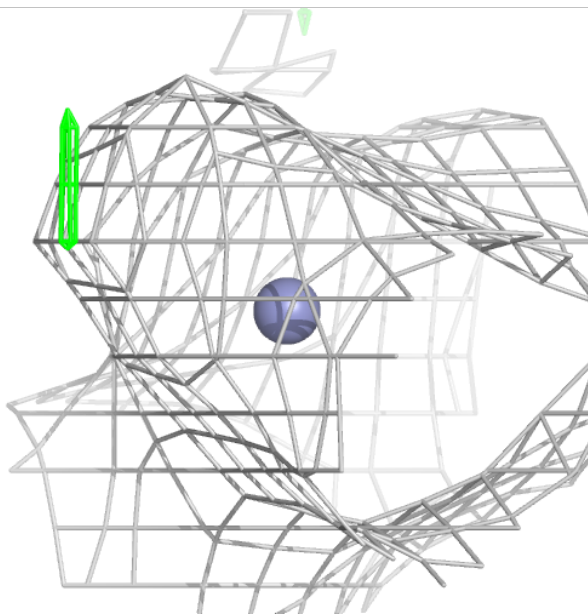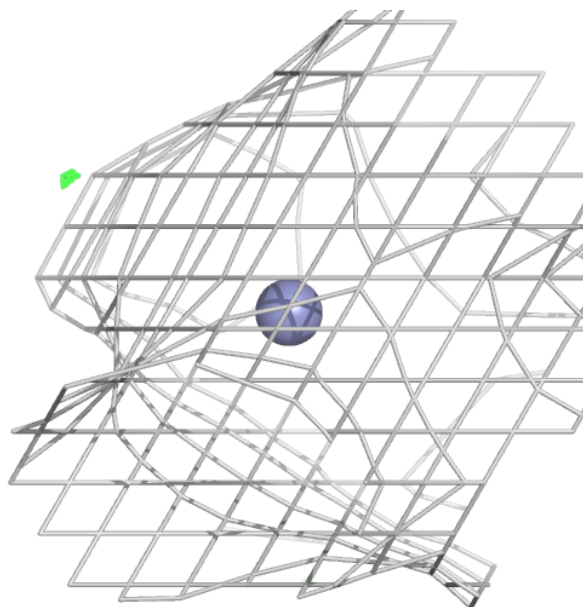
Electron density around ZN H 500:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
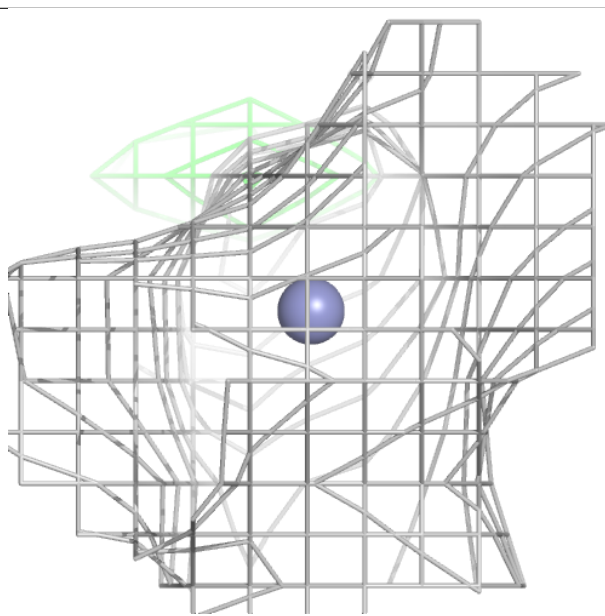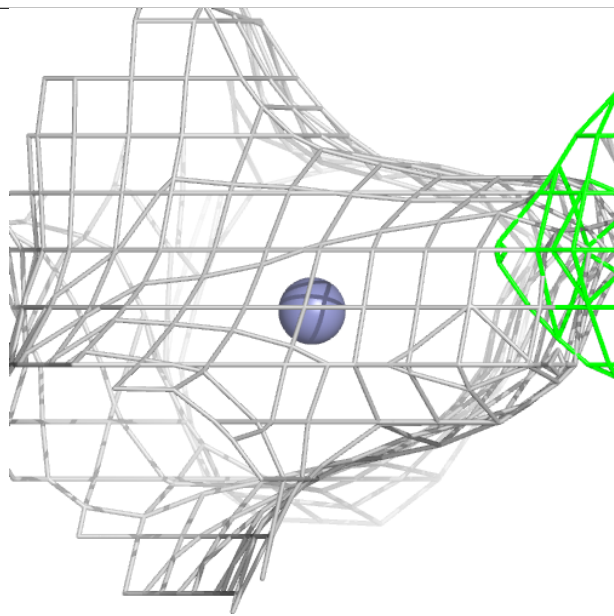and green (positive)
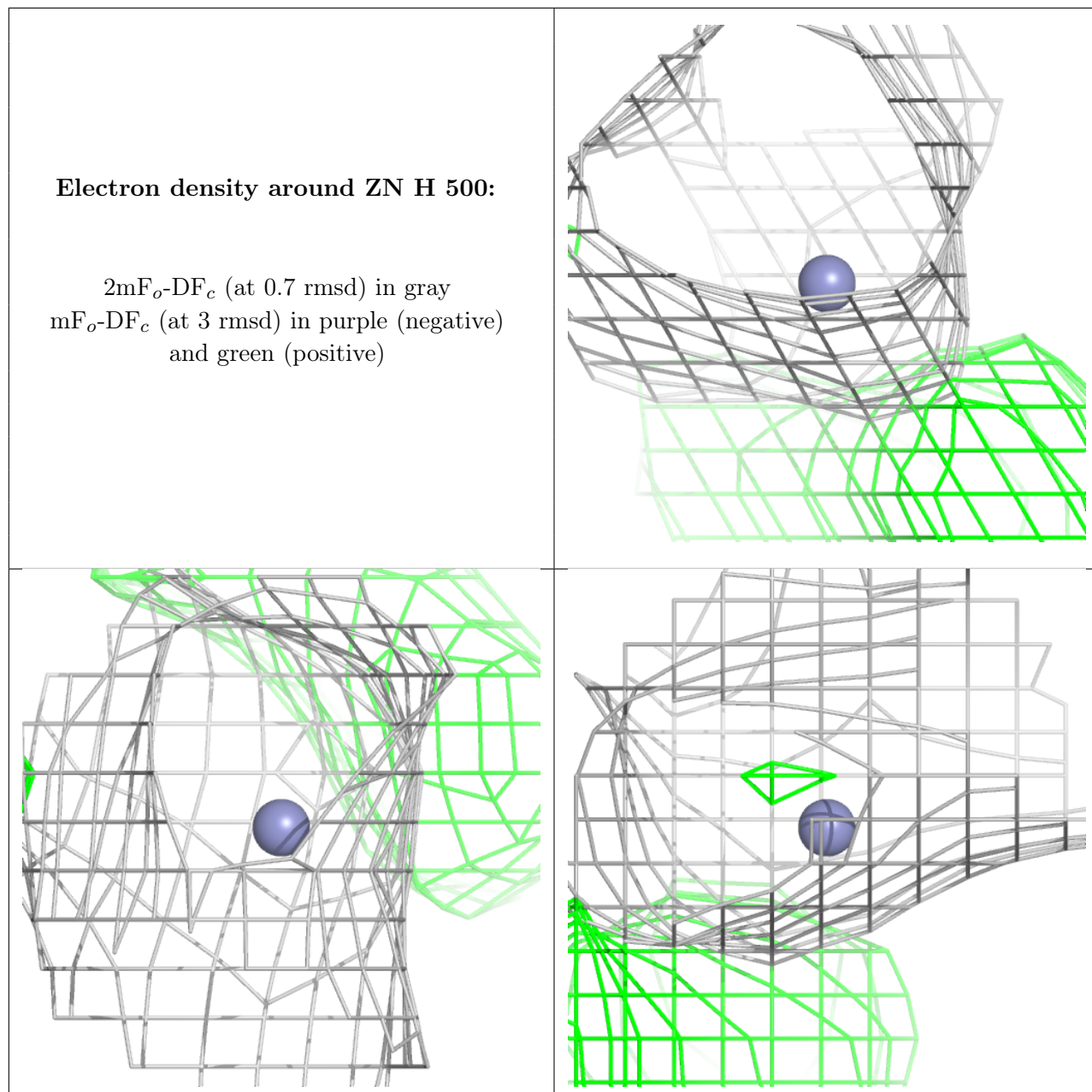
Electron density around ZN B 302:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
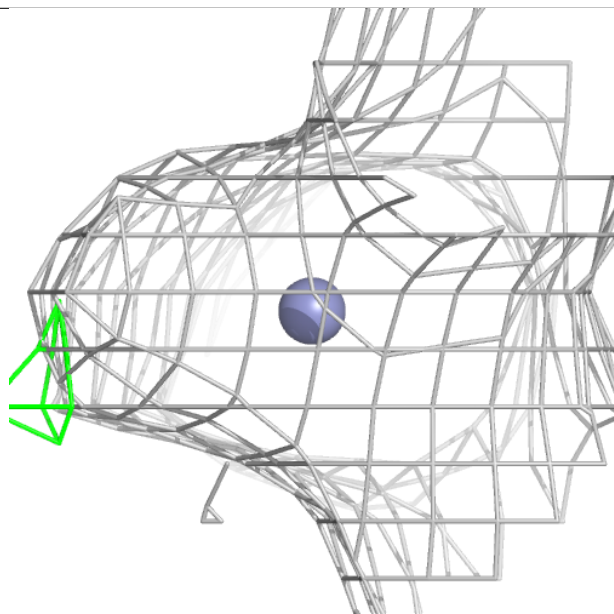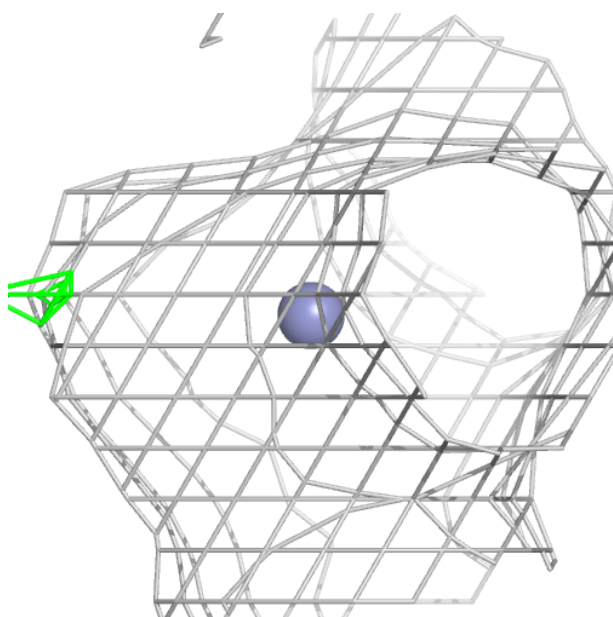
Electron density around ZN C 301:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
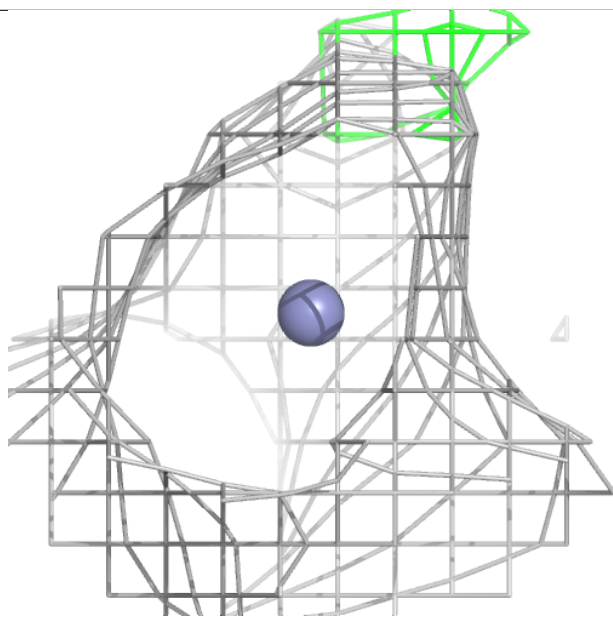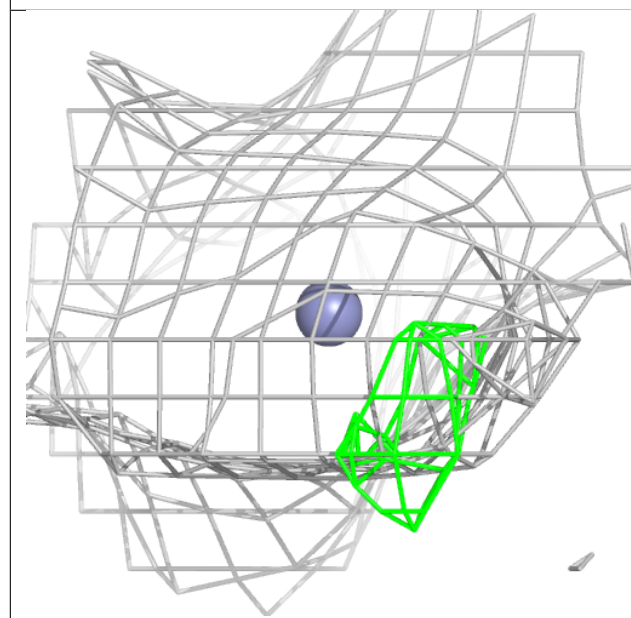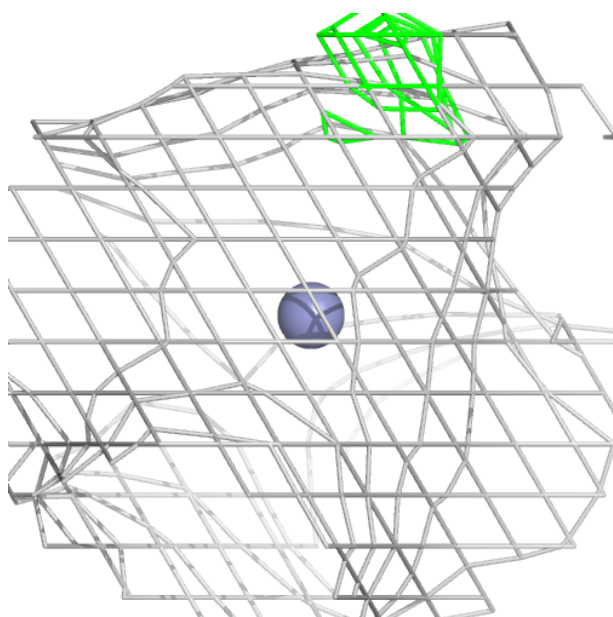
Electron density around ZN D 302:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
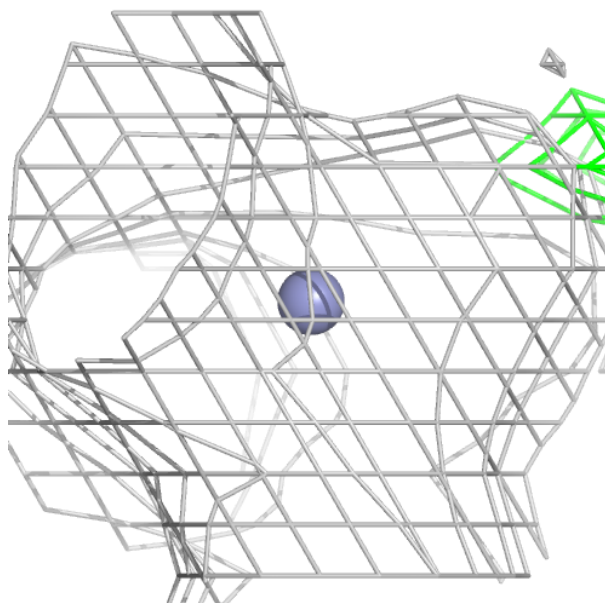$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
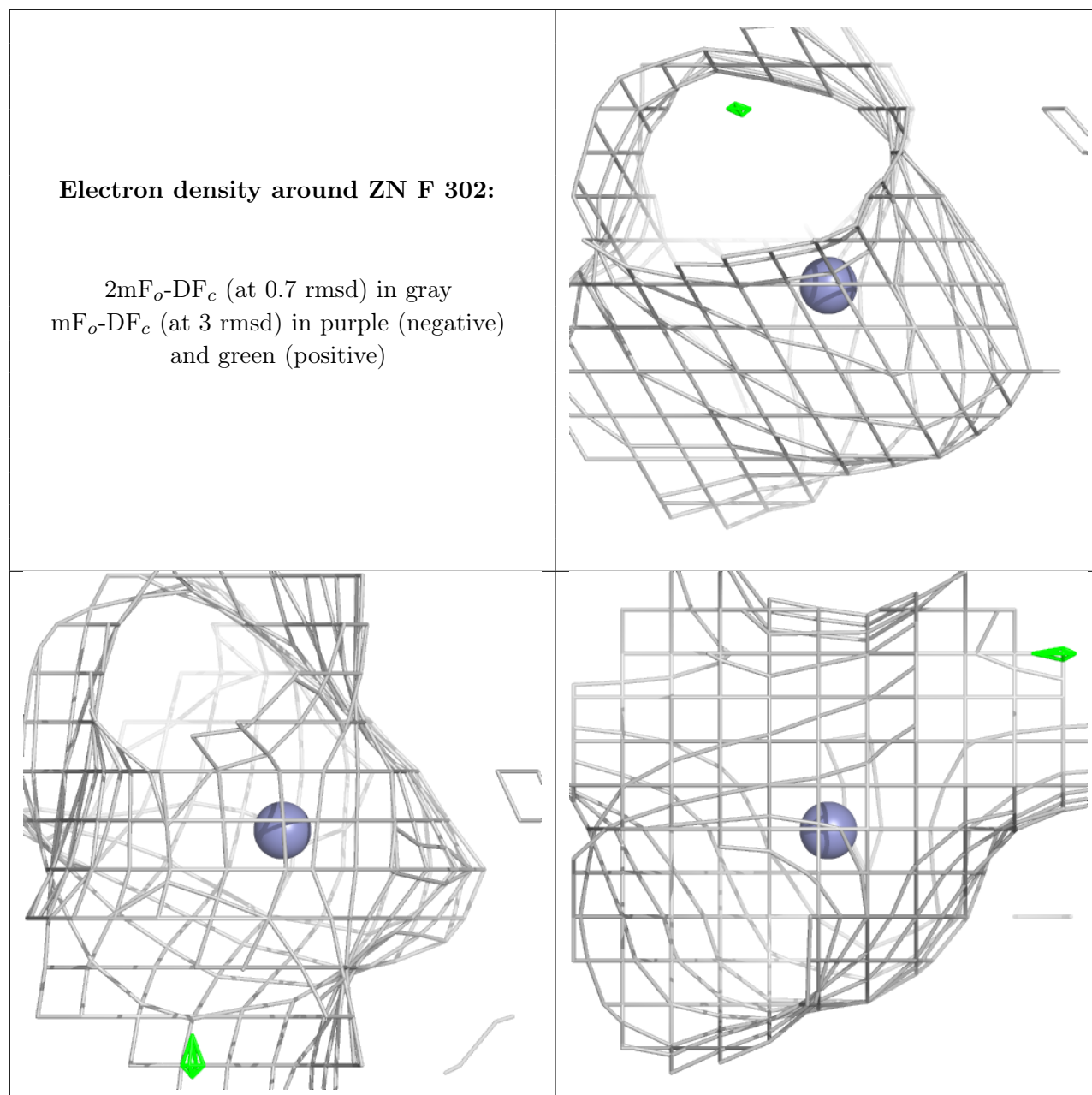and green (positive)
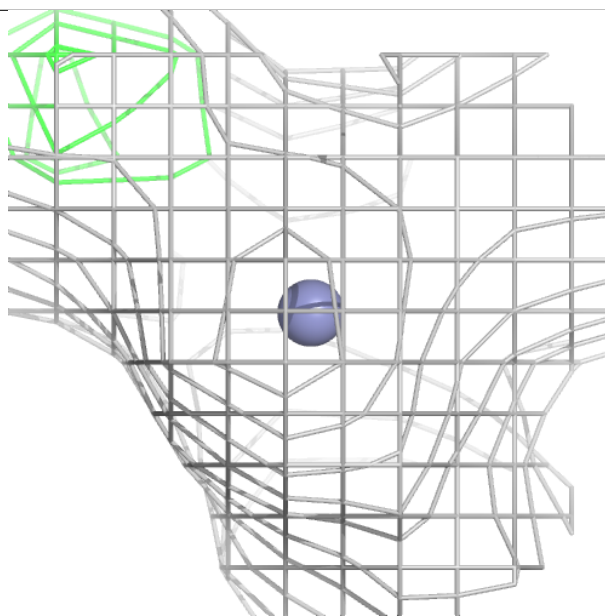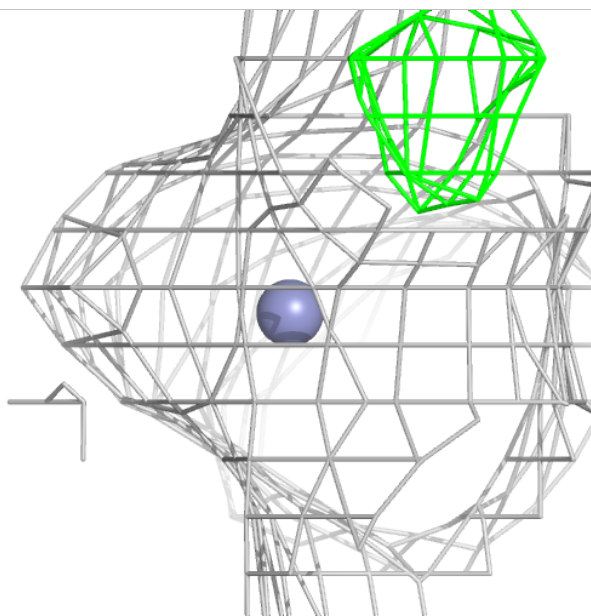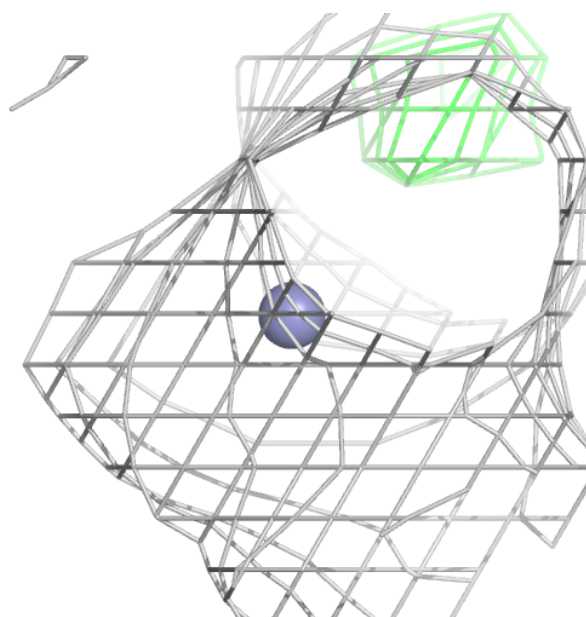
Electron density around ZN E 301:

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

Electron density around ZN A 301:

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

Electron density around ZN F 302:

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

6.5 Other polymers ⓘ

There are no such residues in this entry.