WORLDWIDE wwPDB PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report ⓘ

Oct 25, 2025 – 12:04 PM EDT

PDB ID	:	9EFN / pdb_00009efn
Title	:	Crystal structure of Saccharomyces cerevisiae cross-linked Sfh1 (K197C, F233C) mutant in complex with phosphatidylethanolamine
Authors	:	Green, S.M.; Laganowsky, A.; Krieger, I.; Singh, P.K.; Sacchettini, J.; Igumenova, T.I.; Bankaitis, V.A.
Deposited on	:	2024-11-20
Resolution	:	1.75 Å(reported)

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

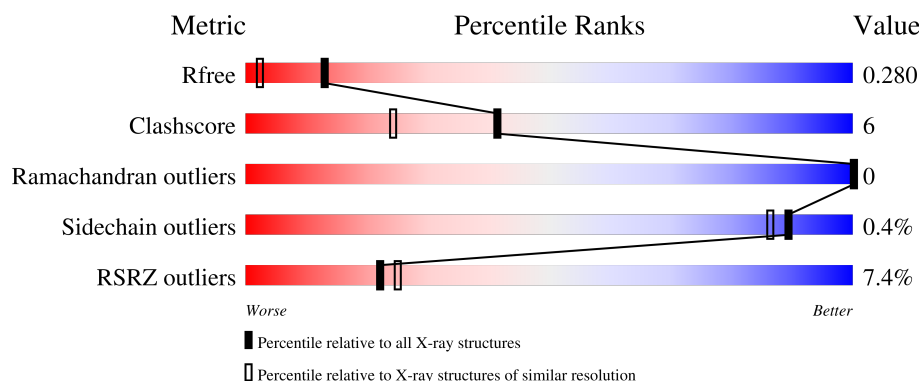|		
MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.46

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 1.75 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		0.280
Clashscore		6
Ramachandran outliers		0
Sidechain outliers		0.4%
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}	164625	2888 (1.76-1.76)
Clashscore	180529	3097 (1.76-1.76)
Ramachandran outliers	177936	3072 (1.76-1.76)
Sidechain outliers	177891	3072 (1.76-1.76)
RSRZ outliers	164620	2887 (1.76-1.76)

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	310	7% / 89% / 10% ·
1	B	310	8% / 87% / 13%

2 Entry composition ⓘ

There are 5 unique types of molecules in this entry. The entry contains 5817 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 CRAL-TRIO domain-containing protein YKL091C.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	309	Total	C	N	O	S	0	5	0
			2566	1655	420	478	13			
1	B	309	Total	C	N	O	S	0	4	0
			2556	1653	418	472	13			

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	197	CYS	LYS	engineered mutation	UNP P33324
A	223	TRP	PHE	engineered mutation	UNP P33324
A	233	CYS	PHE	engineered mutation	UNP P33324
B	197	CYS	LYS	engineered mutation	UNP P33324
B	223	TRP	PHE	engineered mutation	UNP P33324
B	233	CYS	PHE	engineered mutation	UNP P33324

- Molecule 2 is PHOSPHATIDYLETHANOLAMINE (CCD ID: PTY) (formula: $C_{40}H_{80}NO_8P$) (labeled as "Ligand of Interest" by depositor).
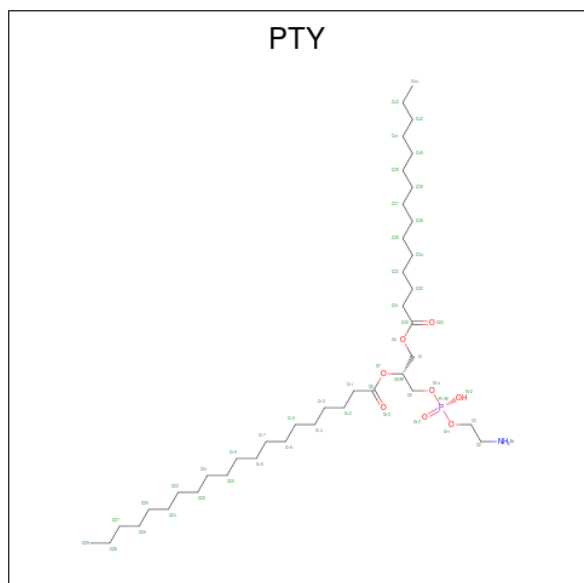
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total 50	C 40	N 1	O 8	P 1	0	0
2	B	1	Total 50	C 40	N 1	O 8	P 1	0	0

- Molecule 3 is SULFATE ION (CCD ID: SO4) (formula: O_4S) (labeled as "Ligand of Interest" by depositor).
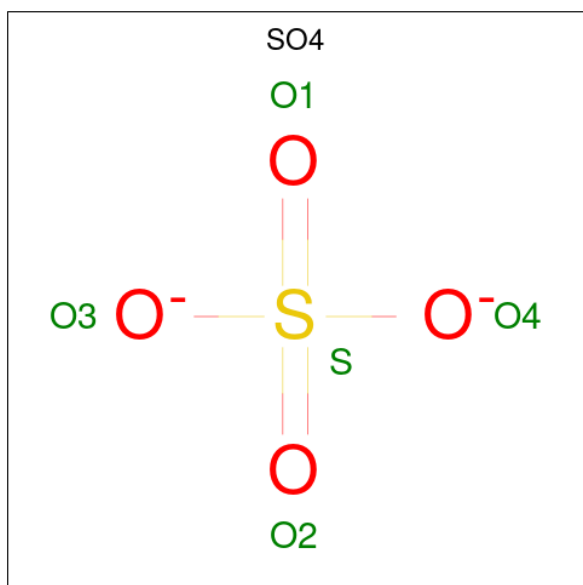
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total 5	O 4	S 1	0	0
3	A	1	Total 5	O 4	S 1	0	0
3	A	1	Total 5	O 4	S 1	0	0
3	A	1	Total 5	O 4	S 1	0	0
3	B	1	Total 5	O 4	S 1	0	0
3	B	1	Total 5	O 4	S 1	0	0

- Molecule 4 is GLYCEROL (CCD ID: GOL) (formula: $C_3H_8O_3$) (labeled as "Ligand of Interest" by depositor).

GOL

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	B	1	Total 6	C 3	O 3	0	0
4	B	1	Total 6	C 3	O 3	0	0

- Molecule 5 is water.

| Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	266	Total 266	O 266	0	0
5	B	287	Total 287	O 287	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: CRAL-TRIO domain-containing protein YKL091C

Chain A:

• Molecule 1: CRAL-TRIO domain-containing protein YKL091C

Chain B:
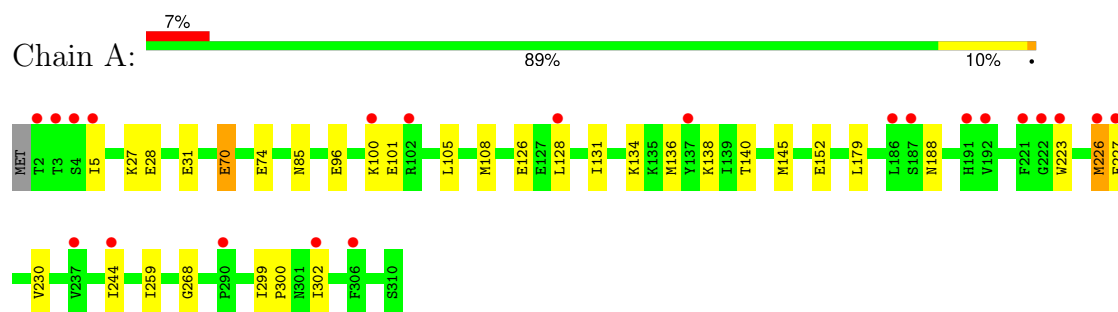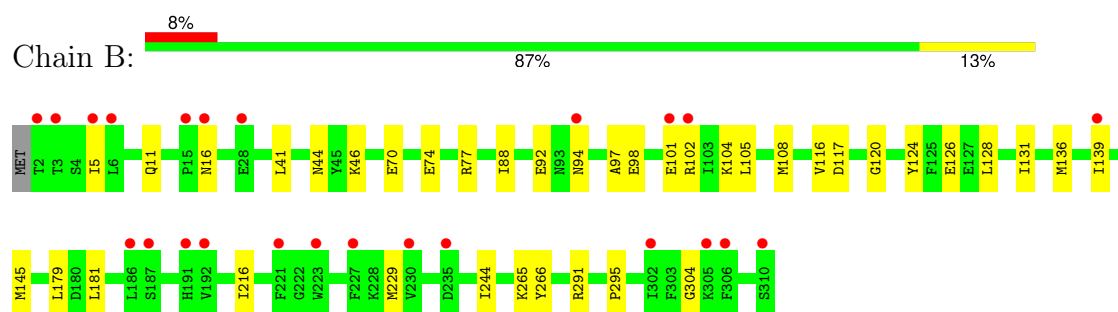
4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	49.43Å 72.01Å 114.68Å 90.00° 93.95° 90.00°	Depositor
Resolution (Å)	46.46 – 1.75	Depositor
	46.46 – 1.75	EDS
% Data completeness (in resolution range)	98.8 (46.46-1.75)	Depositor
	98.8 (46.46-1.75)	EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.80 (at 1.75Å)	Xtriage
Refinement program	PHENIX 1.20.1_4487	Depositor
R, R_{free}	0.241 , 0.279	Depositor
	0.242 , 0.280	DCC
R_{free} test set	4004 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å^2)	20.7	Xtriage
Anisotropy	0.706	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.37 , 40.8	EDS
L-test for twinning[2]	$< |L| > = 0.47, < L^2 > = 0.30$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.93	EDS
Total number of atoms	5817	wwPDB-VP
Average B, all atoms (Å^2)	25.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 16.29% 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: GOL, SO4, PTY

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	0.32	0/2643	0.51	0/3574
1	B	0.34	0/2633	0.54	0/3563
All	All	0.33	0/5276	0.53	0/7137

There are no bond length outliers.

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	2566	0	2553	27	0
1	B	2556	0	2555	36	0
2	A	50	0	79	8	0
2	B	50	0	79	6	0
3	A	20	0	0	0	0
3	B	10	0	0	0	0
4	B	12	0	16	2	0
5	A	266	0	0	7	0
5	B	287	0	0	10	0
All	All	5817	0	5282	66	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 6.

All (66) 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:B:46:LYS:NZ	5:B:501:HOH:O	1.91	0.82
1:B:41:LEU:O	5:B:501:HOH:O	1.98	0.82
1:A:101:GLU:OE2	5:A:501:HOH:O	2.06	0.73
2:B:401:PTY:H362	2:B:401:PTY:H152	1.73	0.70
1:A:28:GLU:OE2	5:A:503:HOH:O	2.11	0.68
1:B:16:ASN:ND2	5:B:502:HOH:O	2.17	0.67
1:A:223[A]:TRP:HE1	1:A:244:ILE:HD13	1.61	0.66
1:B:145[A]:MET:HE1	2:B:401:PTY:H222	1.78	0.65
1:A:27:LYS:O	1:A:31:GLU:HG3	1.97	0.64
1:B:126:GLU:HB2	1:B:179:LEU:HD12	1.80	0.64
1:A:126:GLU:HB2	1:A:179:LEU:HD12	1.80	0.64
1:B:88:ILE:O	1:B:92:GLU:HG3	1.99	0.62
1:B:102:ARG:HD2	5:B:607:HOH:O	1.99	0.62
1:A:105:LEU:HD21	1:A:136:MET:HE2	1.80	0.62
1:B:291:ARG:HG3	4:B:403:GOL:H32	1.86	0.57
1:B:70:GLU:O	1:B:74:GLU:HG3	2.05	0.56
1:A:302:ILE:HG22	5:A:707:HOH:O	2.05	0.56
1:B:11:GLN:O	5:B:503:HOH:O	2.18	0.55
1:A:140:THR:HG23	2:A:401:PTY:H291	1.89	0.55
1:A:96:GLU:O	1:A:100:LYS:HG2	2.07	0.54
1:A:259:ILE:HG13	1:A:268:GLY:HA2	1.90	0.54
1:A:188:ASN:HB3	2:A:401:PTY:H442	1.91	0.53
1:B:229:MET:HE2	1:B:229:MET:HA	1.91	0.53
1:B:136:MET:HG2	2:B:401:PTY:C29	2.41	0.51
1:B:116[B]:VAL:HG11	1:B:120:GLY:HA2	1.92	0.51
1:A:105:LEU:CD2	1:A:136:MET:HE2	2.41	0.50
1:B:124:TYR:CD2	2:B:401:PTY:HC31	2.47	0.50
1:A:70:GLU:HG3	1:A:74:GLU:OE1	2.11	0.50
1:A:152:GLU:HG3	5:A:504:HOH:O	2.11	0.50
1:B:101:GLU:HA	1:B:104:LYS:NZ	2.27	0.50
1:B:77:ARG:HD3	5:B:582:HOH:O	2.12	0.49
1:B:5:ILE:HG13	1:B:295:PRO:HG2	1.95	0.49
1:B:101:GLU:HA	1:B:104:LYS:HZ3	1.76	0.48
1:B:216:ILE:HB	1:B:244:ILE:HD13	1.96	0.47
1:B:105:LEU:HD21	1:B:139:ILE:HB	1.97	0.46
1:B:116[B]:VAL:HG12	1:B:117:ASP:O	2.16	0.46
1:A:128:LEU:HD23	2:A:401:PTY:H411	1.97	0.46
1:A:302:ILE:HG12	5:A:534:HOH:O	2.16	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:108:MET:HG2	1:B:131:ILE:HA	1.99	0.45
1:B:104:LYS:HE2	1:B:139:ILE:HG23	1.98	0.45
1:B:136:MET:HG2	2:B:401:PTY:H292	1.97	0.45
1:A:108:MET:HG2	1:A:131:ILE:HA	1.99	0.45
1:B:265:LYS:HE3	1:B:266:TYR:CZ	2.53	0.44
1:B:131:ILE:HD13	2:B:401:PTY:H212	1.99	0.44
1:A:145[A]:MET:SD	2:A:401:PTY:H262	2.57	0.44
1:A:299:ILE:HG13	1:A:300:PRO:HD2	1.99	0.44
1:A:226:MET:HE3	1:A:230:VAL:HG23	2.00	0.43
1:B:97:ALA:O	1:B:101:GLU:HG2	2.17	0.43
1:A:5:ILE:H	1:A:5:ILE:HG13	1.64	0.43
1:A:134:LYS:O	1:A:138:LYS:HG3	2.19	0.43
1:B:304:GLY:HA2	4:B:402:GOL:H11	2.01	0.43
1:B:94:ASN:O	1:B:98:GLU:HG2	2.19	0.43
1:B:116[B]:VAL:HG13	1:B:120:GLY:C	2.43	0.43
1:A:223[A]:TRP:HZ3	2:A:401:PTY:H381	1.83	0.43
1:B:44:ASN:HA	5:B:501:HOH:O	2.18	0.43
1:A:134:LYS:HG2	5:A:706:HOH:O	2.19	0.42
1:A:226:MET:HE2	1:A:227:PHE:N	2.35	0.42
1:A:145[A]:MET:HE1	2:A:401:PTY:H212	2.02	0.42
1:B:128:LEU:HD12	1:B:181:LEU:HD22	2.02	0.42
2:A:401:PTY:H262	2:A:401:PTY:H231	1.94	0.42
1:B:265:LYS:HE2	5:B:677:HOH:O	2.20	0.41
2:A:401:PTY:H201	2:A:401:PTY:H171	1.75	0.41
1:B:116[B]:VAL:CG1	1:B:120:GLY:HA2	2.50	0.41
1:B:102:ARG:NH2	5:B:524:HOH:O	2.54	0.41
1:B:11:GLN:HB3	5:B:503:HOH:O	2.21	0.40
1:A:85:ASN:HB2	5:A:664:HOH:O	2.20	0.40

There are no symmetry-related clashes.

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	312/310 (101%)	307 (98%)	5 (2%)	0	100	100
1	B	311/310 (100%)	306 (98%)	5 (2%)	0	100	100
All	All	623/620 (100%)	613 (98%)	10 (2%)	0	100	100

There are no Ramachandran outliers to report.

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	285/281 (101%)	283 (99%)	2 (1%)	81	74
1	B	284/281 (101%)	284 (100%)	0	100	100
All	All	569/562 (101%)	567 (100%)	2 (0%)	89	86

All (2) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	70	GLU
1	A	226	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	111	GLN

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 oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

10 ligands are modelled in this entry.

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	$\#\|Z\| > 2$
2	PTY	B	401	-	49,49,49	0.48	0	52,54,54	0.72	0
3	SO4	B	404	-	4,4,4	0.24	0	6,6,6	0.16	0
3	SO4	A	403	-	4,4,4	0.26	0	6,6,6	0.13	0
3	SO4	A	405	-	4,4,4	0.24	0	6,6,6	0.08	0
3	SO4	B	405	-	4,4,4	0.22	0	6,6,6	0.14	0
4	GOL	B	403	-	5,5,5	1.27	1 (20%)	5,5,5	1.17	1 (20%)
4	GOL	B	402	-	5,5,5	0.89	0	5,5,5	1.16	0
3	SO4	A	402	-	4,4,4	0.24	0	6,6,6	0.12	0
2	PTY	A	401	-	49,49,49	0.45	0	52,54,54	0.65	0
3	SO4	A	404	-	4,4,4	0.27	0	6,6,6	0.17	0

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
4	GOL	B	402	-	-	0/4/4/4	-
4	GOL	B	403	-	-	2/4/4/4	-
2	PTY	A	401	-	-	27/53/53/53	-
2	PTY	B	401	-	-	25/53/53/53	-

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	B	403	GOL	O2-C2	-2.16	1.37	1.43

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	B	403	GOL	C3-C2-C1	-2.17	103.84	111.80

There are no chirality outliers.

All (54) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	401	PTY	C3-O11-P1-O13
2	A	401	PTY	C3-O11-P1-O14
2	A	401	PTY	C5-O14-P1-O13
2	B	401	PTY	C3-O11-P1-O14
2	A	401	PTY	C31-C30-O4-C1
2	A	401	PTY	O30-C30-O4-C1
2	A	401	PTY	C12-C13-C14-C15
2	B	401	PTY	C30-C31-C32-C33
2	B	401	PTY	C8-C11-C12-C13
4	B	403	GOL	C1-C2-C3-O3
2	B	401	PTY	C18-C19-C20-C21
2	B	401	PTY	C22-C23-C24-C25
2	A	401	PTY	C34-C35-C36-C37
2	B	401	PTY	C19-C20-C21-C22
2	B	401	PTY	C24-C25-C26-C27
2	B	401	PTY	C34-C35-C36-C37
2	B	401	PTY	C25-C26-C27-C28
2	A	401	PTY	C18-C19-C20-C21
2	A	401	PTY	C24-C25-C26-C27
2	A	401	PTY	C37-C38-C39-C40
2	A	401	PTY	C30-C31-C32-C33
2	A	401	PTY	C31-C32-C33-C34
2	B	401	PTY	C38-C39-C40-C41
4	B	403	GOL	O2-C2-C3-O3
2	B	401	PTY	C32-C33-C34-C35
2	A	401	PTY	C32-C33-C34-C35
2	A	401	PTY	C25-C26-C27-C28
2	B	401	PTY	C11-C12-C13-C14
2	A	401	PTY	O14-C5-C6-O7
2	B	401	PTY	C23-C24-C25-C26
2	B	401	PTY	C33-C34-C35-C36
2	A	401	PTY	C26-C27-C28-C29
2	B	401	PTY	C15-C16-C17-C18
2	B	401	PTY	C14-C15-C16-C17
2	A	401	PTY	C17-C18-C19-C20

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Mol	Chain	Res	Type	Atoms
2	B	401	PTY	C17-C18-C19-C20
2	A	401	PTY	C35-C36-C37-C38
2	A	401	PTY	C19-C20-C21-C22
2	A	401	PTY	O14-C5-C6-C1
2	A	401	PTY	O4-C1-C6-C5
2	A	401	PTY	O4-C1-C6-O7
2	B	401	PTY	C39-C40-C41-C42
2	B	401	PTY	C6-C5-O14-P1
2	B	401	PTY	C3-O11-P1-O13
2	A	401	PTY	C23-C24-C25-C26
2	B	401	PTY	C21-C22-C23-C24
2	A	401	PTY	C20-C21-C22-C23
2	A	401	PTY	C6-C5-O14-P1
2	B	401	PTY	C37-C38-C39-C40
2	B	401	PTY	C12-C13-C14-C15
2	B	401	PTY	C26-C27-C28-C29
2	B	401	PTY	C31-C32-C33-C34
2	A	401	PTY	C12-C11-C8-O7
2	A	401	PTY	C12-C11-C8-O10

There are no ring outliers.

4 monomers are involved in 16 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	401	PTY	6	0
4	B	403	GOL	1	0
4	B	402	GOL	1	0
2	A	401	PTY	8	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.
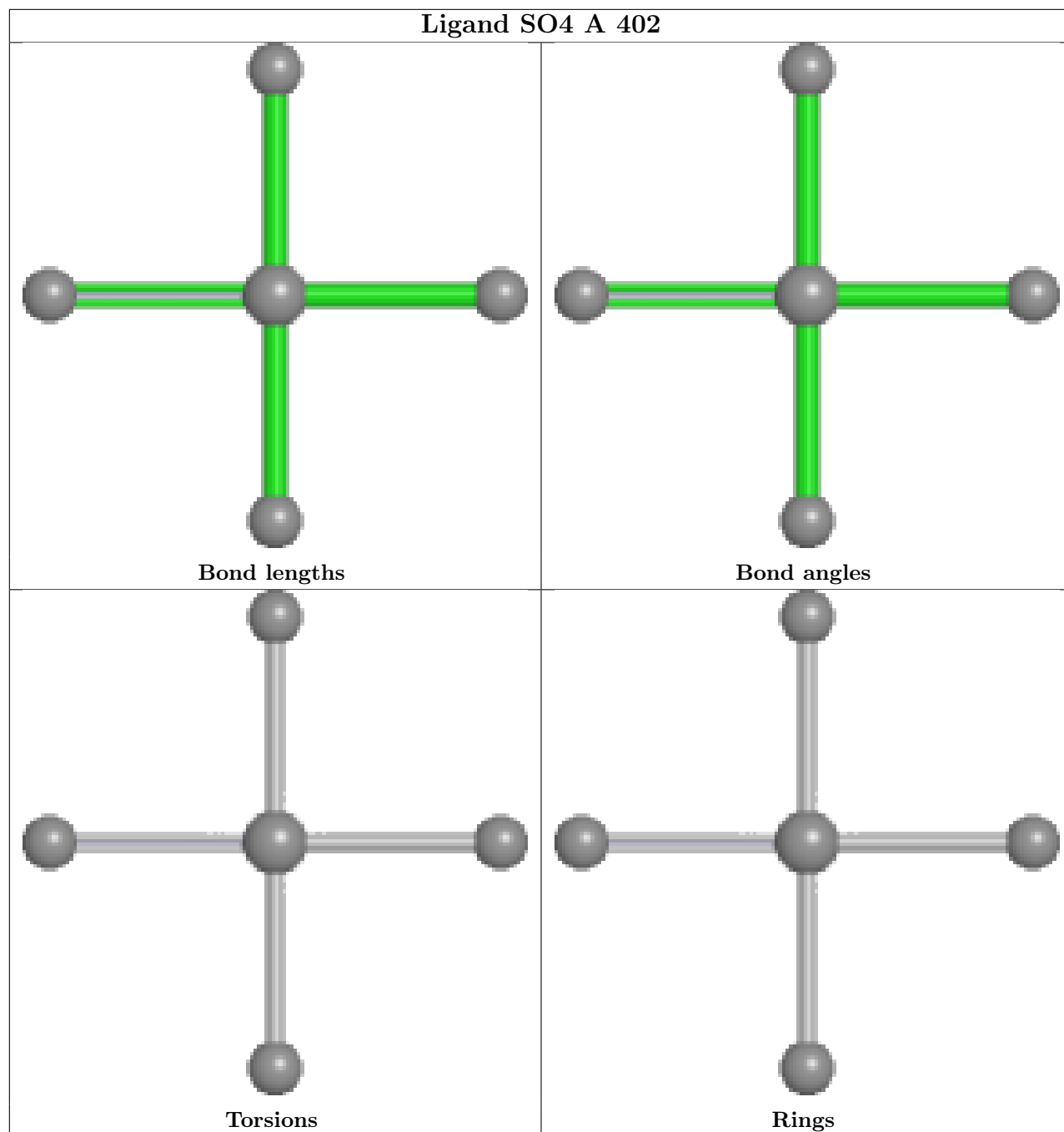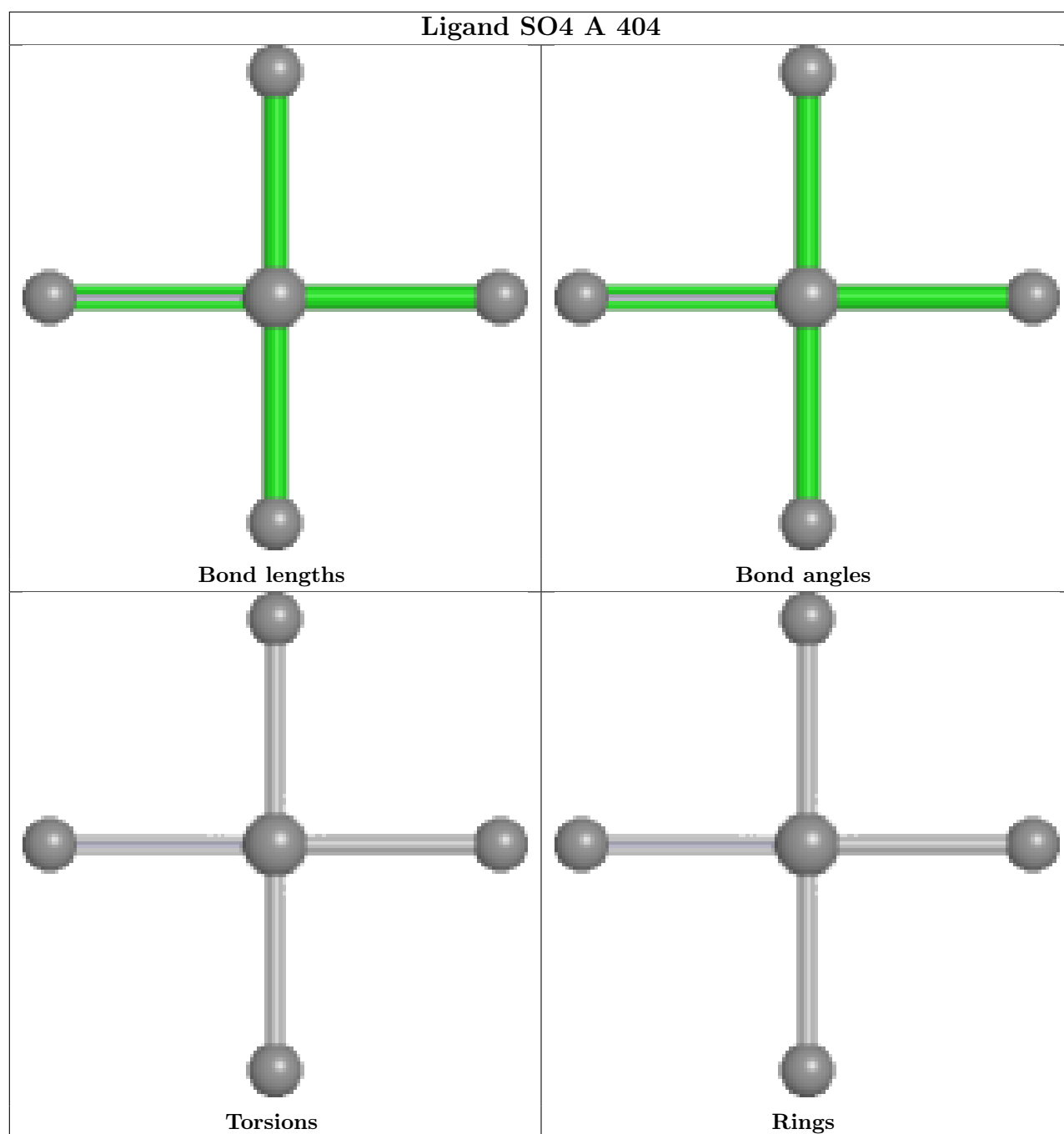
Ligand PTY B 401

Bond lengths

Bond angles

Torsions

Rings

Ligand SO4 B 404

Bond lengths

Bond angles

Torsions

Rings

Ligand SO4 A 403

Bond lengths

Bond angles

Torsions

Rings

Ligand SO4 A 405

Bond lengths

Bond angles

Torsions

Rings

Ligand SO4 B 405

Bond lengths

Bond angles

Torsions

Rings

Ligand GOL B 403

Bond lengths

Bond angles

Torsions

Rings

Ligand GOL B 402

Bond lengths

Bond angles

Torsions

Rings

Ligand SO4 A 402	
Bond lengths	Bond angles
Torsions	Rings

Ligand PTY A 401	
Bond lengths	Bond angles
Torsions	Rings

Ligand SO4 A 404

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, 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(Å^2)	Q<0.9
1	A	309/310 (99%)	0.87	22 (7%)	23	26	10, 23, 38, 66	5 (1%)
1	B	309/310 (99%)	0.81	24 (7%)	20	23	11, 23, 36, 71	4 (1%)
All	All	618/620 (99%)	0.84	46 (7%)	22	25	10, 23, 37, 71	9 (1%)

All (46) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	3	THR	5.1
1	A	2	THR	4.7
1	B	2	THR	4.6
1	B	3	THR	4.4
1	B	310	SER	4.3
1	A	302	ILE	3.7
1	A	191	HIS	3.7
1	B	302	ILE	3.4
1	A	223[A]	TRP	3.4
1	A	186	LEU	3.4
1	A	221	PHE	3.1
1	B	139	ILE	2.9
1	A	5	ILE	2.9
1	B	187	SER	2.8
1	A	4	SER	2.8
1	A	192	VAL	2.7
1	A	306	PHE	2.7
1	A	222	GLY	2.7
1	B	223[A]	TRP	2.7
1	A	226	MET	2.7
1	B	221	PHE	2.5
1	B	186	LEU	2.5
1	B	227	PHE	2.5
1	B	306	PHE	2.4

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Mol	Chain	Res	Type	RSRZ
1	A	100	LYS	2.4
1	B	192	VAL	2.4
1	A	244	ILE	2.3
1	B	102	ARG	2.3
1	A	128	LEU	2.3
1	B	101	GLU	2.2
1	A	227	PHE	2.2
1	B	191	HIS	2.2
1	B	28	GLU	2.1
1	A	137	TYR	2.1
1	B	235	ASP	2.1
1	B	5	ILE	2.1
1	A	290	PRO	2.1
1	A	187	SER	2.1
1	B	16	ASN	2.1
1	B	94	ASN	2.1
1	B	6[A]	LEU	2.1
1	A	237	VAL	2.1
1	B	305	LYS	2.0
1	A	102	ARG	2.0
1	B	230	VAL	2.0
1	B	15	PRO	2.0

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 oligosaccharides 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
4	GOL	B	403	6/6	0.62	0.27	44,47,52,54	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($Å^2$)	Q<0.9
3	SO4	A	403	5/5	0.72	0.17	54,59,65,77	0
3	SO4	A	404	5/5	0.78	0.16	55,59,68,73	0
4	GOL	B	402	6/6	0.80	0.14	38,46,50,50	0
3	SO4	A	405	5/5	0.81	0.12	49,56,69,72	0
3	SO4	A	402	5/5	0.82	0.12	53,60,64,68	0
2	PTY	A	401	50/50	0.85	0.17	20,29,35,36	0
3	SO4	B	405	5/5	0.85	0.11	51,53,64,68	0
2	PTY	B	401	50/50	0.86	0.17	20,30,35,37	0
3	SO4	B	404	5/5	0.90	0.09	46,48,52,57	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 B 403:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
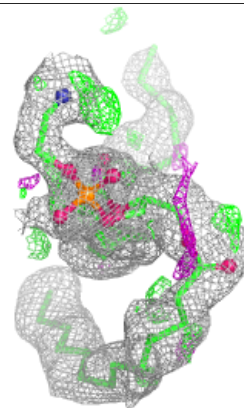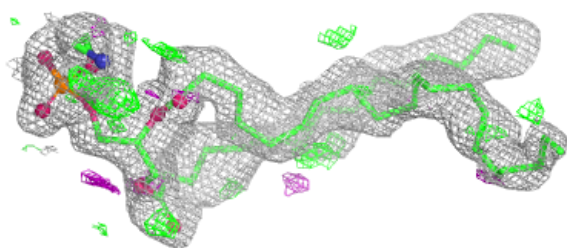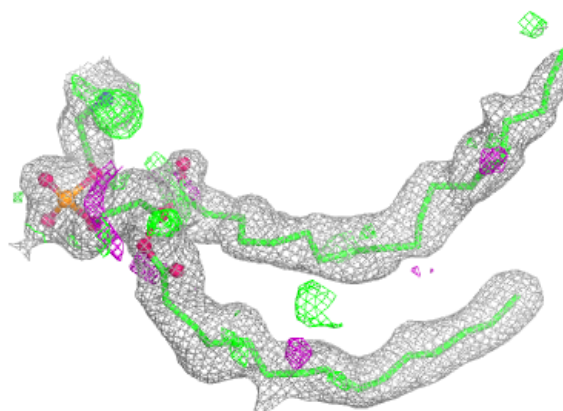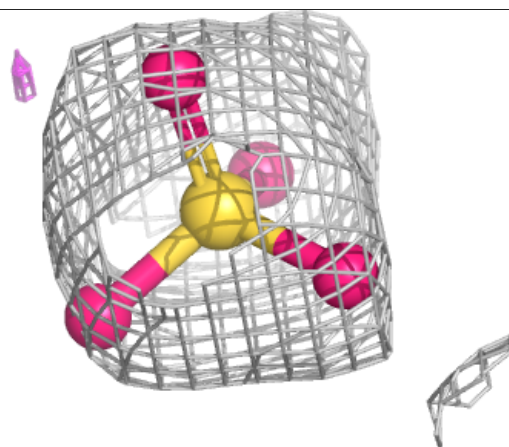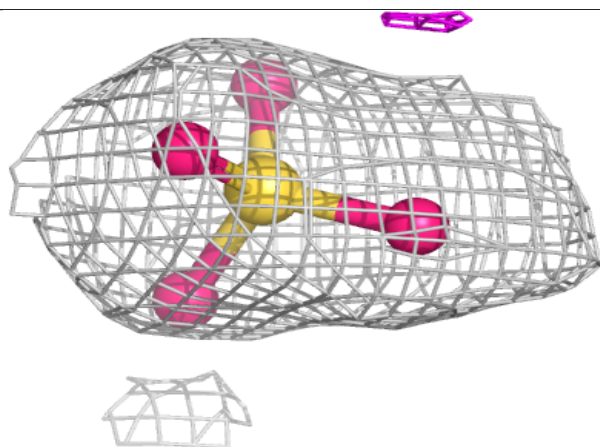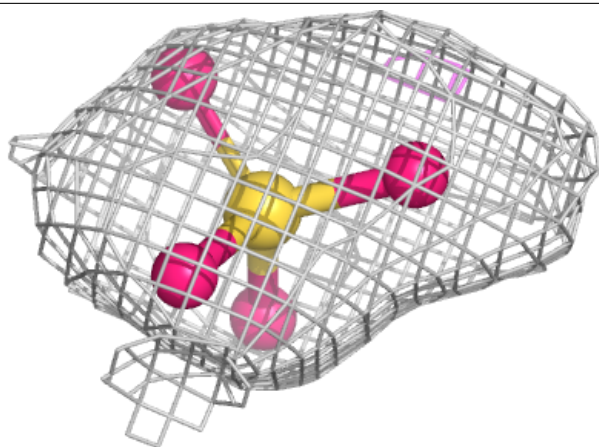mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)
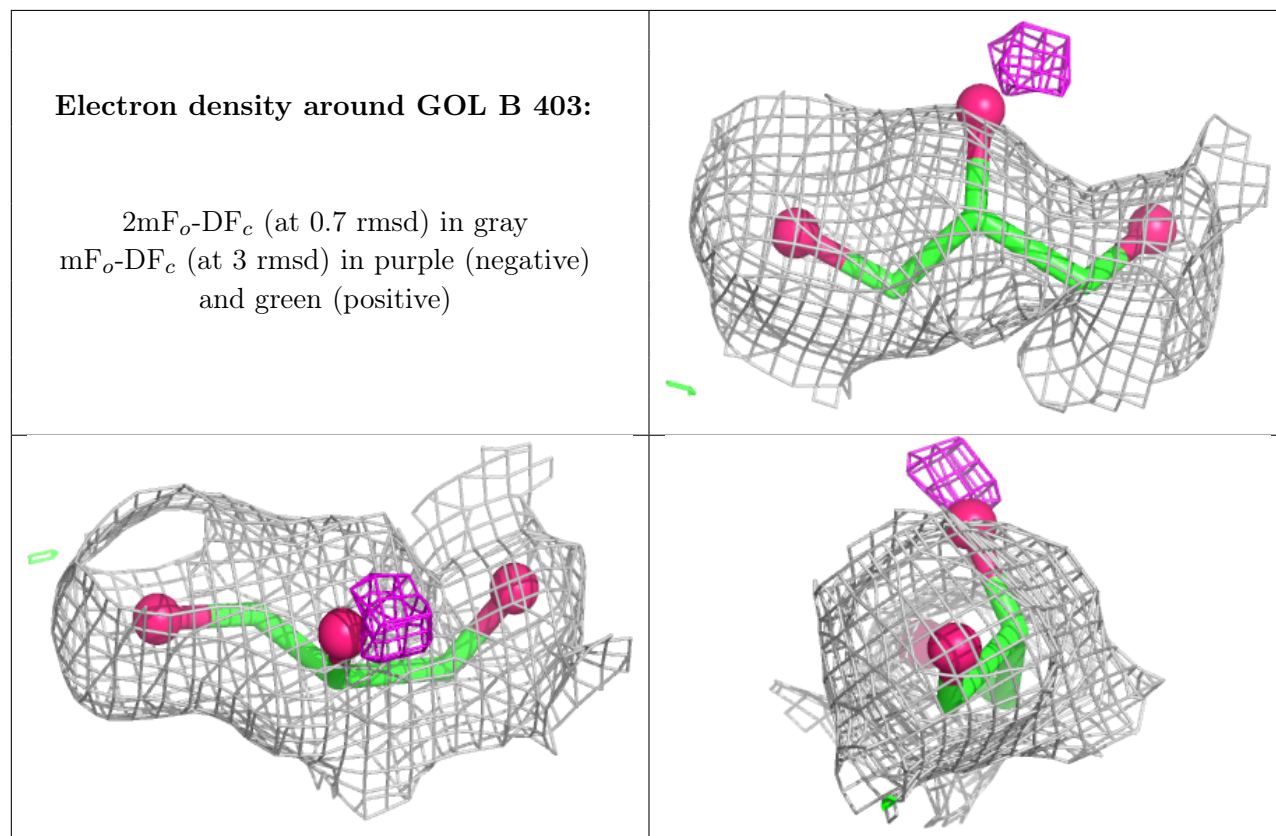
Electron density around SO4 A 403:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
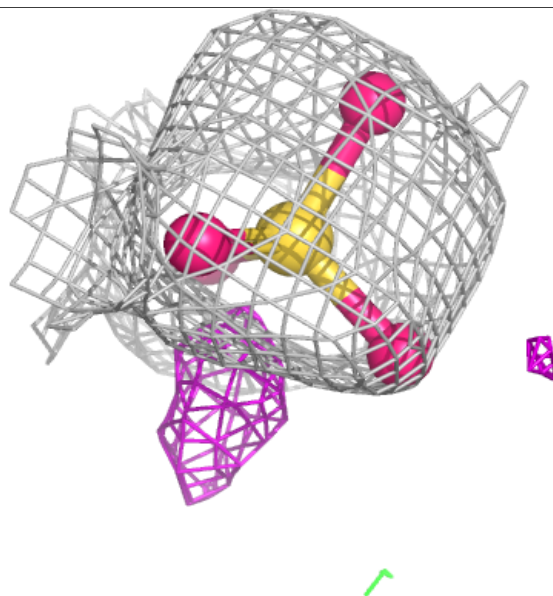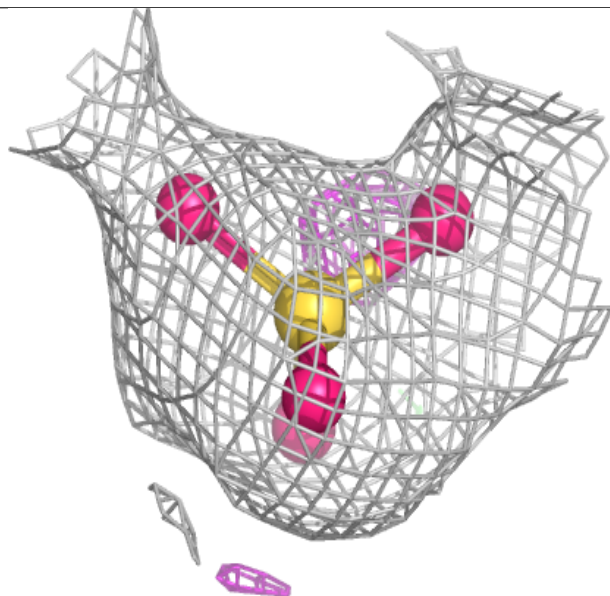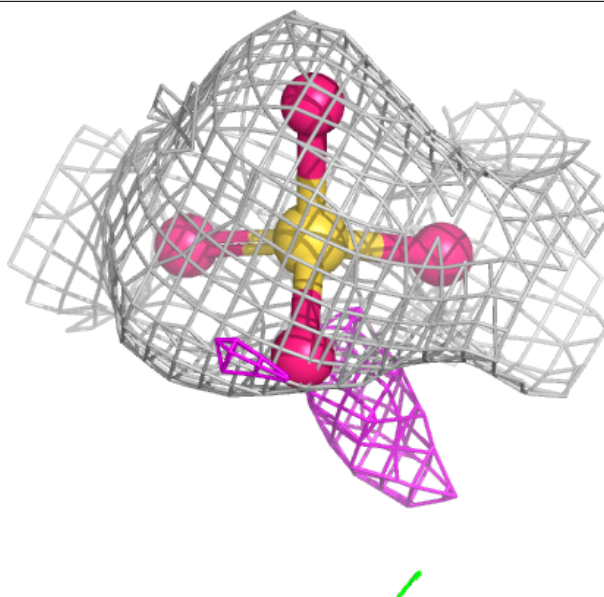
Electron density around SO4 A 404:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
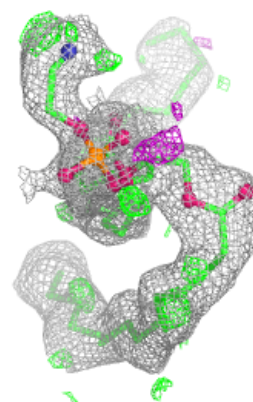and green (positive)
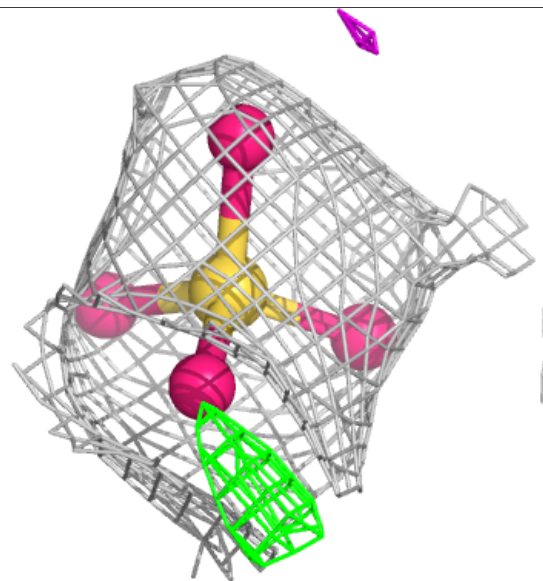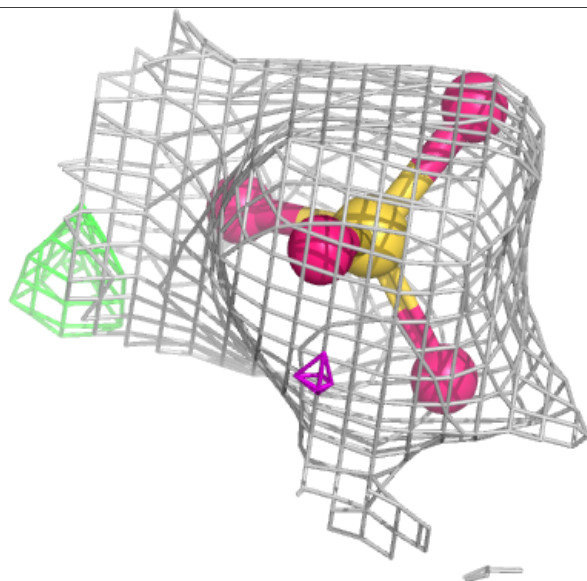
Electron density around GOL B 402:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
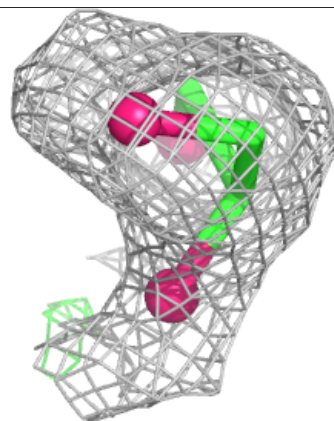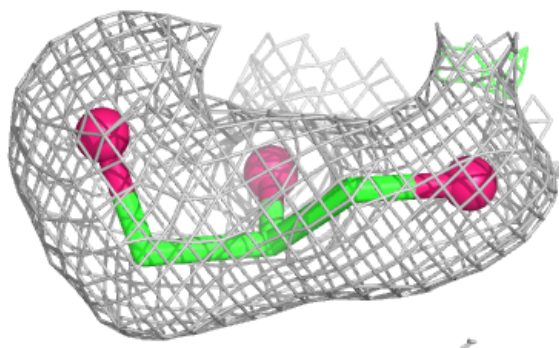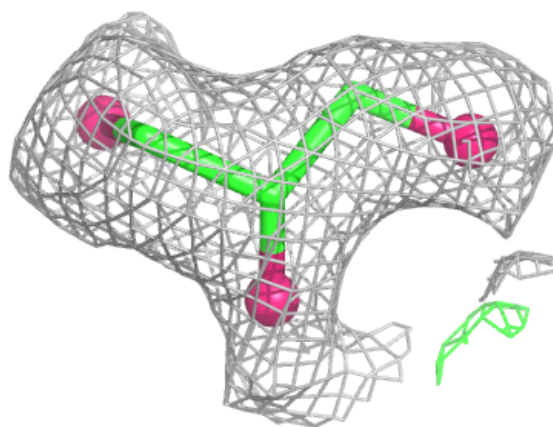
Electron density around SO4 A 405:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
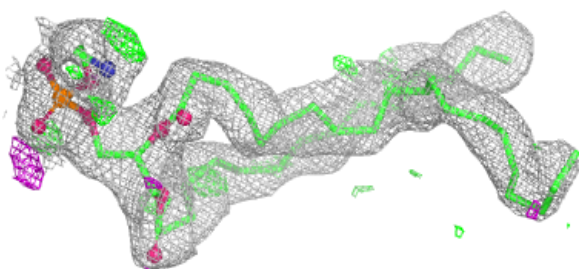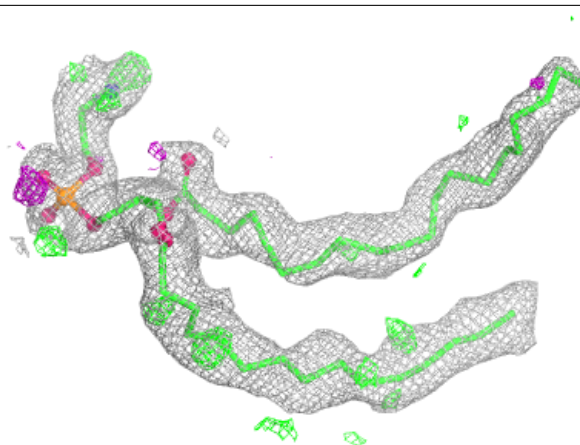and green (positive)
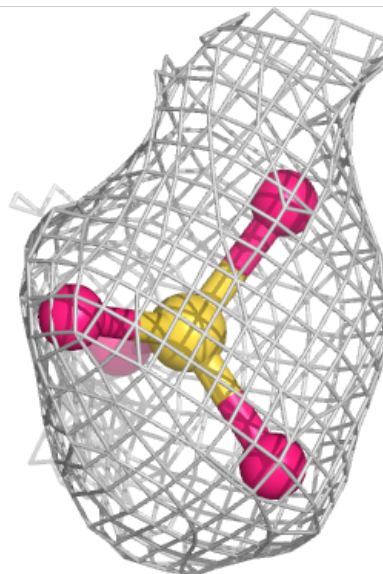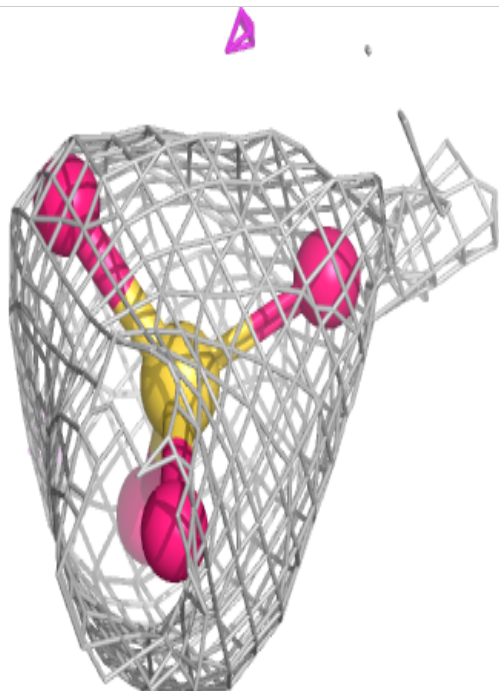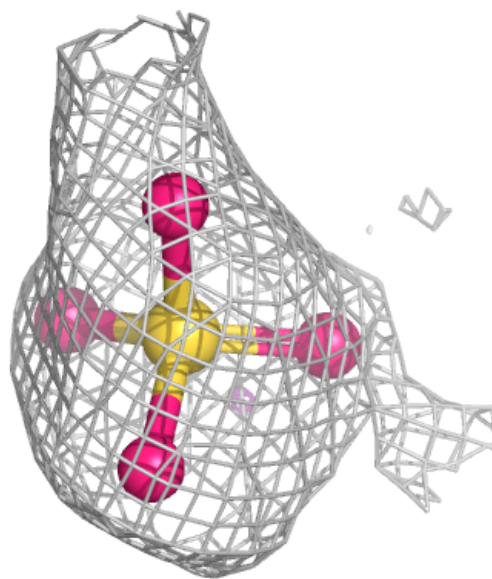
Electron density around SO4 A 402:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
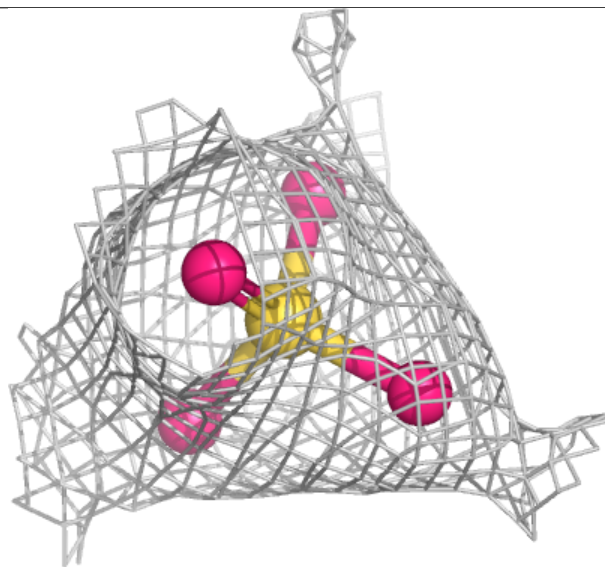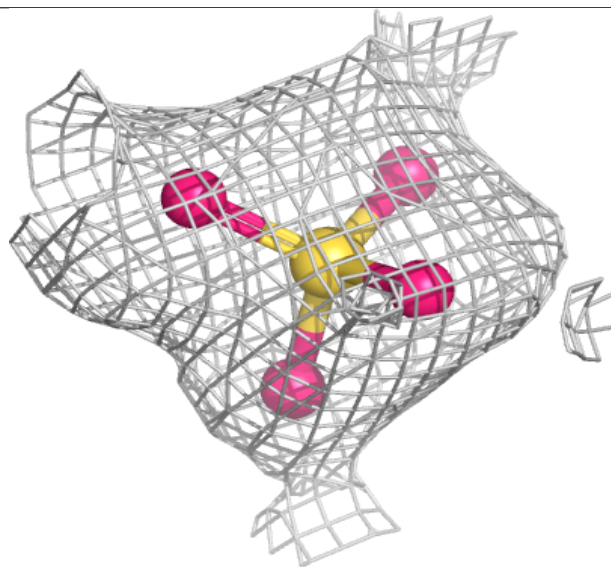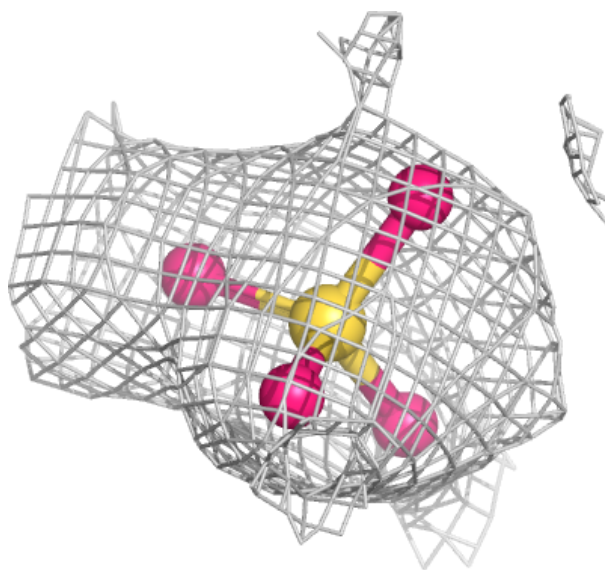
Electron density around PTY A 401:

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

Electron density around SO4 B 405:

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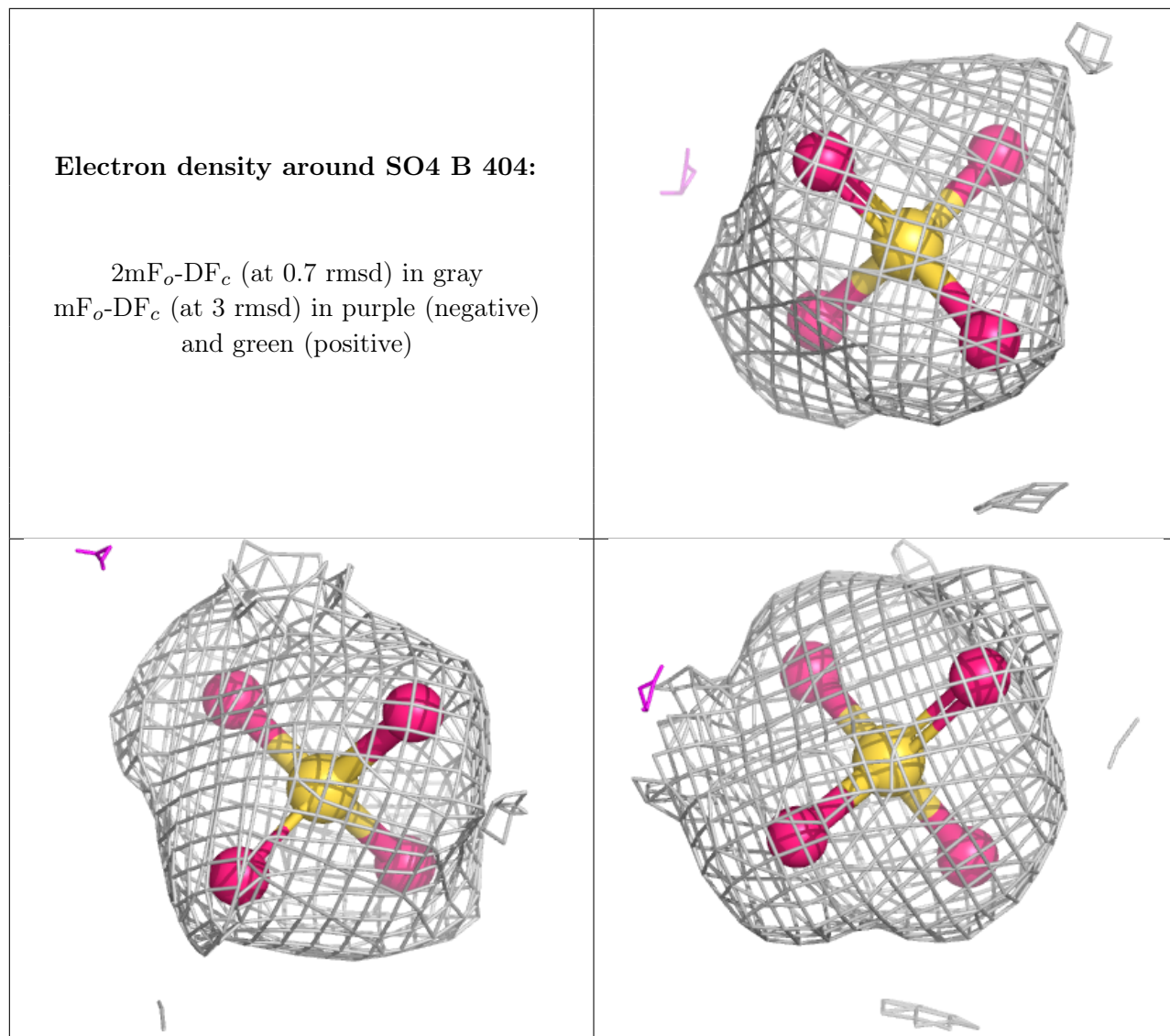and green (positive)

Electron density around PTY 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 SO4 B 404:

$2mF_o\text{-}DF_c$ (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.