



# Full wwPDB X-ray Structure Validation Report ⓘ

Mar 9, 2026 – 12:33 PM UTC

PDB ID : 6TZL / pdb\_00006tzl  
Title : The structure of the Streptococcus gordonii surface protein SspB in complex with TEV peptide provides clues to the adherence of oral streptococcal adherence to salivary agglutinin  
Authors : Schormann, N.; Deivanayagam, C.  
Deposited on : 2019-08-12  
Resolution : 1.60 Å(reported)

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

We welcome your comments at [validation@mail.wwpdb.org](mailto: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 ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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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 : wwPDB partial adaption of 1.1.7 (2018)  
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)  
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) : 2.49

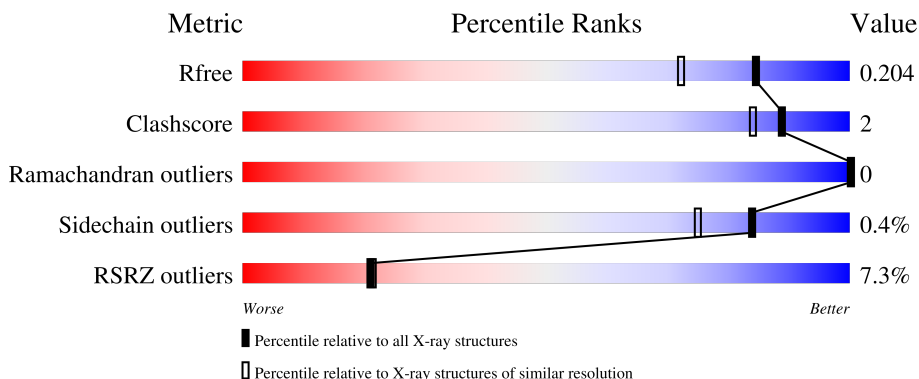
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 1.60 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))
$R_{free}$	180053	4673 (1.60-1.60)
Clashscore	190562	4931 (1.60-1.60)
Ramachandran outliers	187476	4831 (1.60-1.60)
Sidechain outliers	187428	4830 (1.60-1.60)
RSRZ outliers	180081	4672 (1.60-1.60)

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  $\geq 3$ , 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  $\leq 5\%$ . 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	425	 6% 88% 5% 1% 0%
1	B	425	 4% 85% 5% 5% 5%
1	C	425	 7% 92% 1% 1% 0%
1	D	425	 10% 89% 5% 5% 0%

## 2 Entry composition i

There are 3 unique types of molecules in this entry. The entry contains 14201 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 Surface protein adhesin.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	388	Total 3023	C 1900	N 501	O 614	S 8	0	4	0
1	B	384	Total 3007	C 1888	N 498	O 613	S 8	0	6	0
1	C	404	Total 3135	C 1973	N 521	O 633	S 8	0	2	0
1	D	399	Total 3092	C 1948	N 511	O 625	S 8	0	2	0

There are 88 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	433	MET	-	expression tag	UNP C9E3B4
A	434	ALA	-	expression tag	UNP C9E3B4
A	435	SER	-	expression tag	UNP C9E3B4
A	436	MET	-	expression tag	UNP C9E3B4
A	437	THR	-	expression tag	UNP C9E3B4
A	438	GLY	-	expression tag	UNP C9E3B4
A	439	GLY	-	expression tag	UNP C9E3B4
A	440	GLN	-	expression tag	UNP C9E3B4
A	441	GLN	-	expression tag	UNP C9E3B4
A	442	MET	-	expression tag	UNP C9E3B4
A	443	GLY	-	expression tag	UNP C9E3B4
A	444	ARG	-	expression tag	UNP C9E3B4
A	445	ILE	-	expression tag	UNP C9E3B4
A	446	GLN	-	expression tag	UNP C9E3B4
A	850	LEU	-	expression tag	UNP C9E3B4
A	851	GLU	-	expression tag	UNP C9E3B4
A	852	HIS	-	expression tag	UNP C9E3B4
A	853	HIS	-	expression tag	UNP C9E3B4
A	854	HIS	-	expression tag	UNP C9E3B4
A	855	HIS	-	expression tag	UNP C9E3B4
A	856	HIS	-	expression tag	UNP C9E3B4

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Chain	Residue	Modelled	Actual	Comment	Reference
A	857	HIS	-	expression tag	UNP C9E3B4
B	433	MET	-	expression tag	UNP C9E3B4
B	434	ALA	-	expression tag	UNP C9E3B4
B	435	SER	-	expression tag	UNP C9E3B4
B	436	MET	-	expression tag	UNP C9E3B4
B	437	THR	-	expression tag	UNP C9E3B4
B	438	GLY	-	expression tag	UNP C9E3B4
B	439	GLY	-	expression tag	UNP C9E3B4
B	440	GLN	-	expression tag	UNP C9E3B4
B	441	GLN	-	expression tag	UNP C9E3B4
B	442	MET	-	expression tag	UNP C9E3B4
B	443	GLY	-	expression tag	UNP C9E3B4
B	444	ARG	-	expression tag	UNP C9E3B4
B	445	ILE	-	expression tag	UNP C9E3B4
B	446	GLN	-	expression tag	UNP C9E3B4
B	850	LEU	-	expression tag	UNP C9E3B4
B	851	GLU	-	expression tag	UNP C9E3B4
B	852	HIS	-	expression tag	UNP C9E3B4
B	853	HIS	-	expression tag	UNP C9E3B4
B	854	HIS	-	expression tag	UNP C9E3B4
B	855	HIS	-	expression tag	UNP C9E3B4
B	856	HIS	-	expression tag	UNP C9E3B4
B	857	HIS	-	expression tag	UNP C9E3B4
C	433	MET	-	expression tag	UNP C9E3B4
C	434	ALA	-	expression tag	UNP C9E3B4
C	435	SER	-	expression tag	UNP C9E3B4
C	436	MET	-	expression tag	UNP C9E3B4
C	437	THR	-	expression tag	UNP C9E3B4
C	438	GLY	-	expression tag	UNP C9E3B4
C	439	GLY	-	expression tag	UNP C9E3B4
C	440	GLN	-	expression tag	UNP C9E3B4
C	441	GLN	-	expression tag	UNP C9E3B4
C	442	MET	-	expression tag	UNP C9E3B4
C	443	GLY	-	expression tag	UNP C9E3B4
C	444	ARG	-	expression tag	UNP C9E3B4
C	445	ILE	-	expression tag	UNP C9E3B4
C	446	GLN	-	expression tag	UNP C9E3B4
C	850	LEU	-	expression tag	UNP C9E3B4
C	851	GLU	-	expression tag	UNP C9E3B4
C	852	HIS	-	expression tag	UNP C9E3B4
C	853	HIS	-	expression tag	UNP C9E3B4
C	854	HIS	-	expression tag	UNP C9E3B4

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Chain	Residue	Modelled	Actual	Comment	Reference
C	855	HIS	-	expression tag	UNP C9E3B4
C	856	HIS	-	expression tag	UNP C9E3B4
C	857	HIS	-	expression tag	UNP C9E3B4
D	433	MET	-	expression tag	UNP C9E3B4
D	434	ALA	-	expression tag	UNP C9E3B4
D	435	SER	-	expression tag	UNP C9E3B4
D	436	MET	-	expression tag	UNP C9E3B4
D	437	THR	-	expression tag	UNP C9E3B4
D	438	GLY	-	expression tag	UNP C9E3B4
D	439	GLY	-	expression tag	UNP C9E3B4
D	440	GLN	-	expression tag	UNP C9E3B4
D	441	GLN	-	expression tag	UNP C9E3B4
D	442	MET	-	expression tag	UNP C9E3B4
D	443	GLY	-	expression tag	UNP C9E3B4
D	444	ARG	-	expression tag	UNP C9E3B4
D	445	ILE	-	expression tag	UNP C9E3B4
D	446	GLN	-	expression tag	UNP C9E3B4
D	850	LEU	-	expression tag	UNP C9E3B4
D	851	GLU	-	expression tag	UNP C9E3B4
D	852	HIS	-	expression tag	UNP C9E3B4
D	853	HIS	-	expression tag	UNP C9E3B4
D	854	HIS	-	expression tag	UNP C9E3B4
D	855	HIS	-	expression tag	UNP C9E3B4
D	856	HIS	-	expression tag	UNP C9E3B4
D	857	HIS	-	expression tag	UNP C9E3B4

- Molecule 2 is SULFATE ION (CCD ID: SO4) (formula: O<sub>4</sub>S) (labeled as "Ligand of Interest" by depositor).

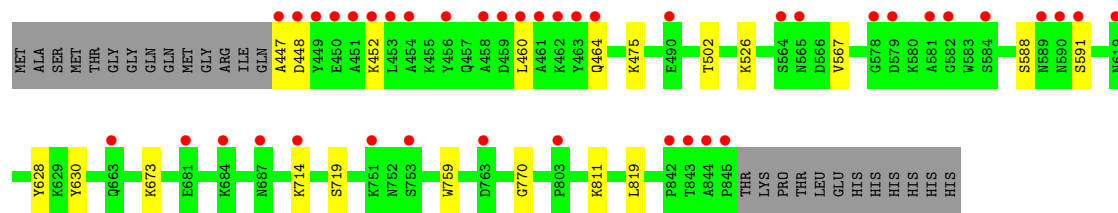


Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total	O	S	0	0
			5	4	1		
2	A	1	Total	O	S	0	0
			5	4	1		
2	B	1	Total	O	S	0	0
			5	4	1		
2	D	1	Total	O	S	0	0
			5	4	1		
2	D	1	Total	O	S	0	0
			5	4	1		
2	D	1	Total	O	S	0	0
			5	4	1		

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	499	Total	O	0	0
			499	499		
3	B	457	Total	O	0	0
			457	457		
3	C	510	Total	O	0	0
			510	510		
3	D	448	Total	O	0	0
			448	448		





## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	65.97Å 133.33Å 246.07Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	34.96 – 1.60 34.96 – 1.60	Depositor EDS
% Data completeness (in resolution range)	99.8 (34.96-1.60) 99.8 (34.96-1.60)	Depositor EDS
$R_{merge}$	0.06	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.75 (at 1.60Å)	Xtrriage
Refinement program	REFMAC 5.8.0253	Depositor
R, $R_{free}$	0.180 , 0.193 0.190 , 0.204	Depositor DCC
$R_{free}$ test set	14429 reflections (5.05%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	19.8	Xtrriage
Anisotropy	0.226	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.35 , 36.8	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	14201	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	26.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.12% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: 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	0.91	0/3086	1.08	1/4181 (0.0%)
1	B	0.91	0/3069	1.11	4/4157 (0.1%)
1	C	0.93	0/3200	1.13	1/4334 (0.0%)
1	D	0.92	0/3157	1.11	0/4278
All	All	0.92	0/12512	1.11	6/16950 (0.0%)

There are no bond length outliers.

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	589	ASN	CA-CB-CG	11.33	123.93	112.60
1	B	589	ASN	CB-CA-C	8.23	126.18	116.63
1	B	712	SER	CB-CA-C	-6.23	103.10	111.88
1	B	628	TYR	N-CA-CB	-5.78	101.69	110.77
1	C	548	GLN	N-CA-CB	-5.40	102.67	110.56
1	A	628	TYR	N-CA-CB	-5.21	102.27	110.77

There are no chirality outliers.

There are no planarity outliers.

### 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	3023	0	2943	14	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	B	3007	0	2922	17	0
1	C	3135	0	3069	7	0
1	D	3092	0	3021	14	0
2	A	10	0	0	0	0
2	B	5	0	0	0	0
2	D	15	0	0	0	0
3	A	499	0	0	0	0
3	B	457	0	0	2	0
3	C	510	0	0	2	0
3	D	448	0	0	5	0
All	All	14201	0	11955	47	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 2.

All (47) 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:D:714:LYS:HE2	3:D:1002:HOH:O	1.21	1.30
1:D:714:LYS:CE	3:D:1002:HOH:O	1.97	0.79
1:B:704:SER:OG	1:B:811:LYS:HE2	1.84	0.78
1:D:588:SER:HB3	1:D:591:SER:OG	1.92	0.69
1:A:641:GLN:OE1	1:B:641:GLN:HB3	1.95	0.67
1:A:628:TYR:CE1	1:A:630:TYR:CE1	2.82	0.67
1:A:588:SER:O	1:A:589:ASN:CG	2.38	0.67
1:B:628:TYR:CE1	1:B:630:TYR:CE1	2.82	0.67
1:C:472:VAL:HG23	3:C:901:HOH:O	1.99	0.63
1:D:502:THR:HG22	1:D:719:SER:OG	2.00	0.62
1:A:641:GLN:HG3	1:B:641:GLN:HG2	1.82	0.61
1:A:641:GLN:CD	1:B:641:GLN:HB3	2.26	0.61
1:D:673:LYS:NZ	3:D:1001:HOH:O	2.26	0.59
1:A:630:TYR:CE1	1:A:655:VAL:HG11	2.37	0.59
1:A:704:SER:OG	1:A:811:LYS:HE2	2.02	0.58
1:A:456:TYR:OH	1:A:460:LEU:HD11	2.06	0.55
1:B:637:LYS:HE2	3:B:1404:HOH:O	2.08	0.53
1:D:714:LYS:NZ	3:D:1002:HOH:O	2.26	0.53
1:A:628:TYR:OH	1:A:819:LEU:HD12	2.09	0.52
1:B:628:TYR:OH	1:B:819:LEU:HD12	2.11	0.50
1:D:447:ALA:HB3	3:D:1298:HOH:O	2.11	0.50
1:B:460:LEU:O	1:B:464:GLN:HG2	2.11	0.50
1:B:462:LYS:NZ	1:B:466:ASP:OD2	2.45	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:588:SER:HB3	1:B:593:VAL:CG1	2.46	0.46
1:B:826:VAL:O	3:B:1001:HOH:O	2.20	0.46
1:D:628:TYR:CE1	1:D:630:TYR:CE2	3.03	0.46
1:C:628:TYR:CE1	1:C:630:TYR:CE2	3.04	0.46
1:B:761[B]:SER:OG	1:B:763[B]:ASP:OD1	2.33	0.46
1:D:628:TYR:OH	1:D:819:LEU:HD12	2.16	0.45
1:B:753:SER:O	1:D:475:LYS:HE3	2.17	0.45
1:D:460:LEU:O	1:D:464:GLN:HG2	2.17	0.45
1:D:448:ASP:O	1:D:452:LYS:HD2	2.18	0.44
1:A:641:GLN:OE1	1:B:641:GLN:CB	2.65	0.43
1:C:739:LYS:HE2	3:C:922:HOH:O	2.19	0.43
1:C:628:TYR:OH	1:C:819:LEU:HD12	2.18	0.43
1:D:526:LYS:HD3	1:D:567:VAL:CG2	2.49	0.43
1:A:630:TYR:CE1	1:A:655:VAL:CG1	3.02	0.42
1:C:759:TRP:CZ3	1:C:770:GLY:HA3	2.55	0.41
1:A:588:SER:HB3	1:A:593:VAL:CG1	2.50	0.41
1:B:759:TRP:CZ3	1:B:770:GLY:HA3	2.56	0.41
1:B:763[B]:ASP:OD1	1:B:763[B]:ASP:N	2.52	0.41
1:D:759:TRP:CZ3	1:D:770:GLY:HA3	2.55	0.41
1:B:674:ASN:O	1:B:782:TYR:HA	2.21	0.41
1:C:556:LEU:HD23	1:C:644:TRP:CE3	2.56	0.41
1:C:674:ASN:O	1:C:782:TYR:HA	2.20	0.41
1:A:674:ASN:O	1:A:782:TYR:HA	2.21	0.41
1:A:588:SER:HB3	1:A:593:VAL:HG11	2.02	0.40

There are no symmetry-related clashes.

## 5.3 Torsion angles [i](#)

### 5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	A	390/425 (92%)	382 (98%)	8 (2%)	0	<a href="#">100</a> <a href="#">100</a>

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	388/425 (91%)	382 (98%)	6 (2%)	0	100	100
1	C	404/425 (95%)	397 (98%)	7 (2%)	0	100	100
1	D	399/425 (94%)	392 (98%)	7 (2%)	0	100	100
All	All	1581/1700 (93%)	1553 (98%)	28 (2%)	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	333/358 (93%)	331 (99%)	2 (1%)	78	66
1	B	332/358 (93%)	331 (100%)	1 (0%)	86	78
1	C	343/358 (96%)	342 (100%)	1 (0%)	86	78
1	D	338/358 (94%)	337 (100%)	1 (0%)	86	78
All	All	1346/1432 (94%)	1341 (100%)	5 (0%)	84	75

All (5) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	663	GLN
1	A	811	LYS
1	B	811	LYS
1	C	811	LYS
1	D	811	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (14) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	516	ASN
1	A	614	GLN
1	A	690	ASN

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Mol	Chain	Res	Type
1	A	699	ASN
1	A	740	GLN
1	B	516	ASN
1	B	589	ASN
1	B	592	GLN
1	B	614	GLN
1	B	615	ASN
1	B	740	GLN
1	C	780	ASN
1	D	518	ASN
1	D	590	ASN

### 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 oligosaccharides in this entry.

### 5.6 Ligand geometry [i](#)

6 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	SO4	D	901	-	4,4,4	0.34	0	6,6,6	0.08	0
2	SO4	B	901	-	4,4,4	0.34	0	6,6,6	0.08	0
2	SO4	A	1001	-	4,4,4	0.35	0	6,6,6	0.10	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
2	SO4	D	903	-	4,4,4	0.33	0	6,6,6	0.08	0
2	SO4	A	1002	-	4,4,4	0.34	0	6,6,6	0.06	0
2	SO4	D	902	-	4,4,4	0.34	0	6,6,6	0.07	0

There are no bond length outliers.

There are no bond angle outliers.

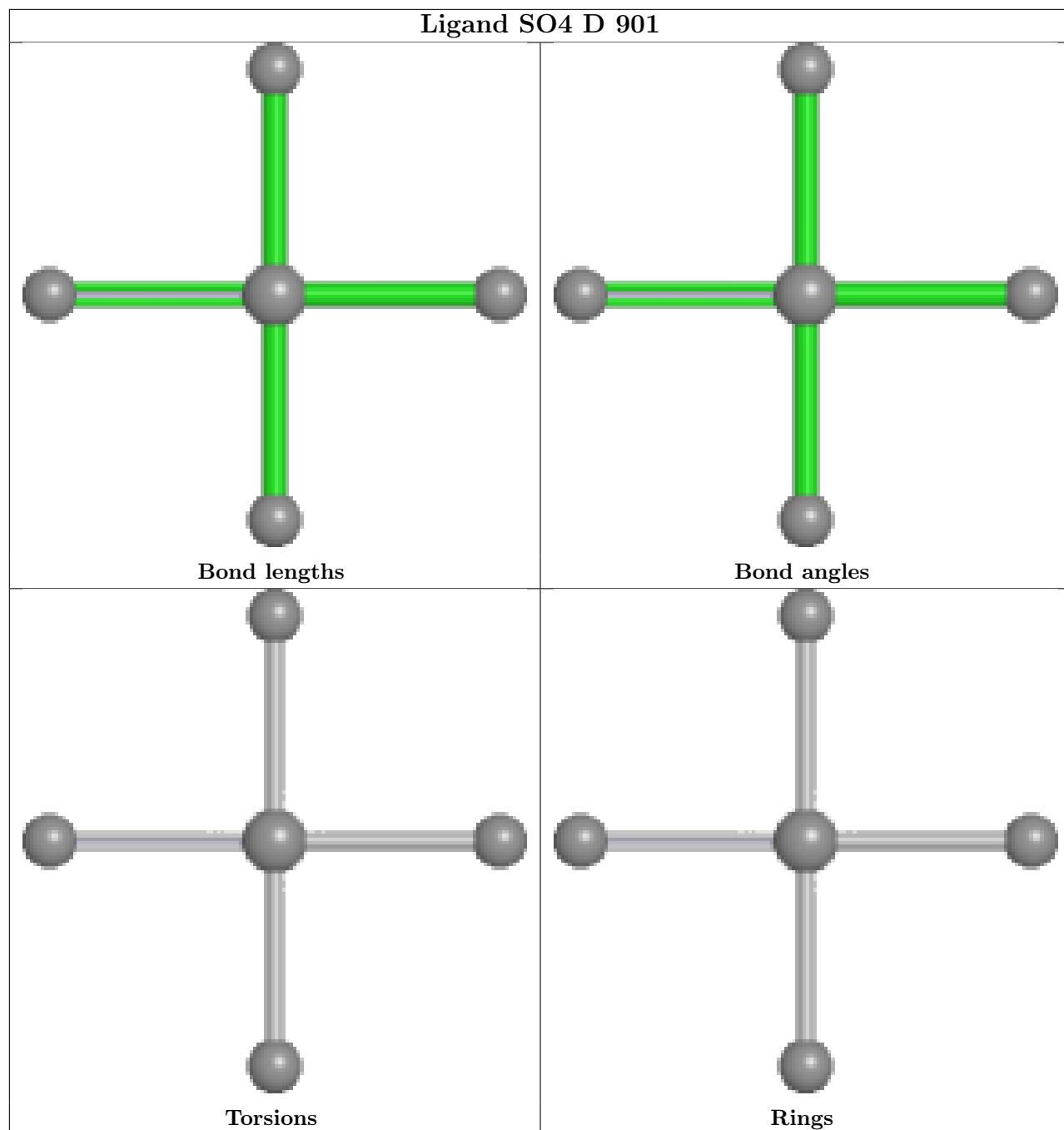
There are no chirality outliers.

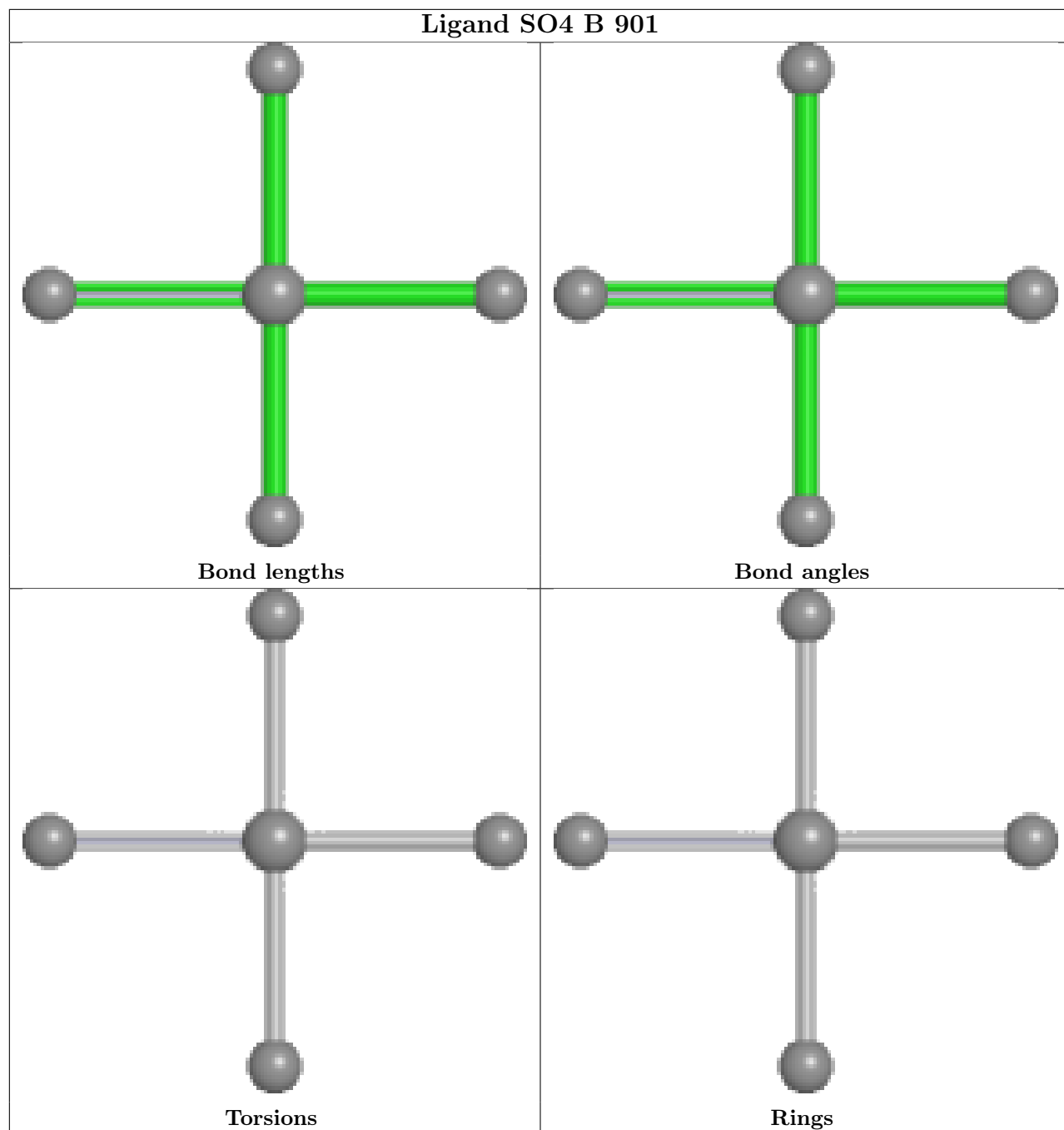
There are no torsion outliers.

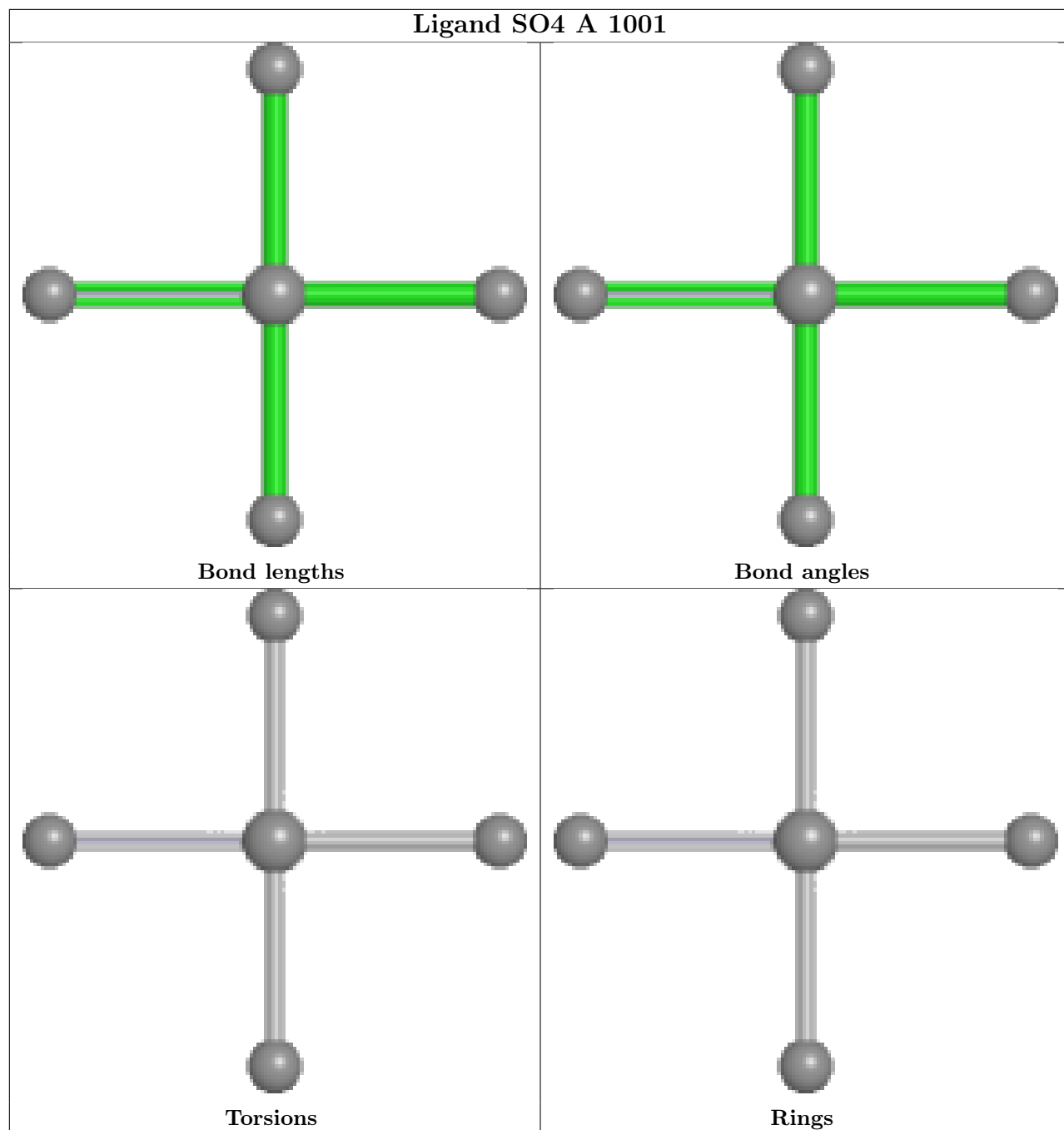
There are no ring outliers.

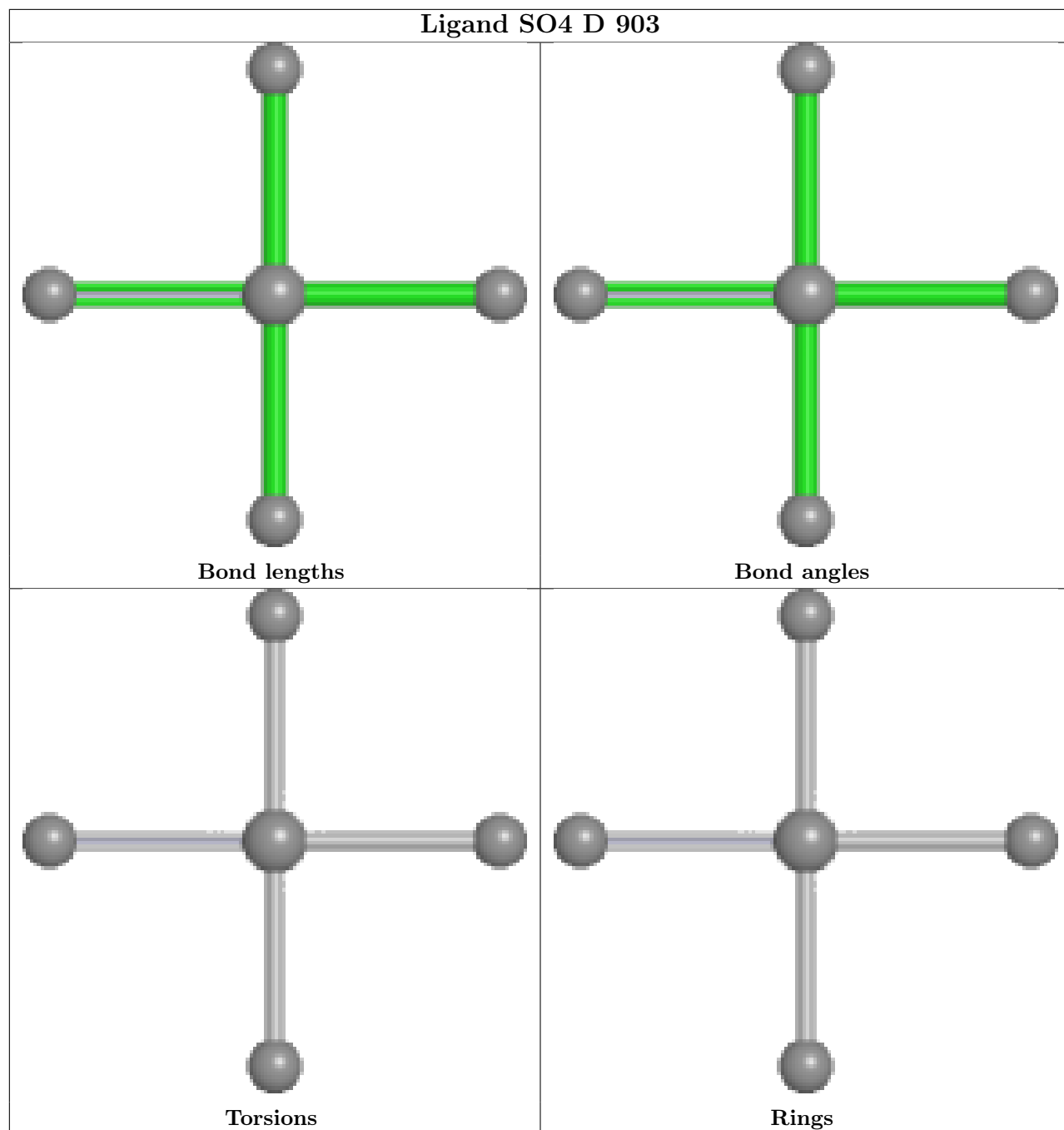
No monomer is involved in short contacts.

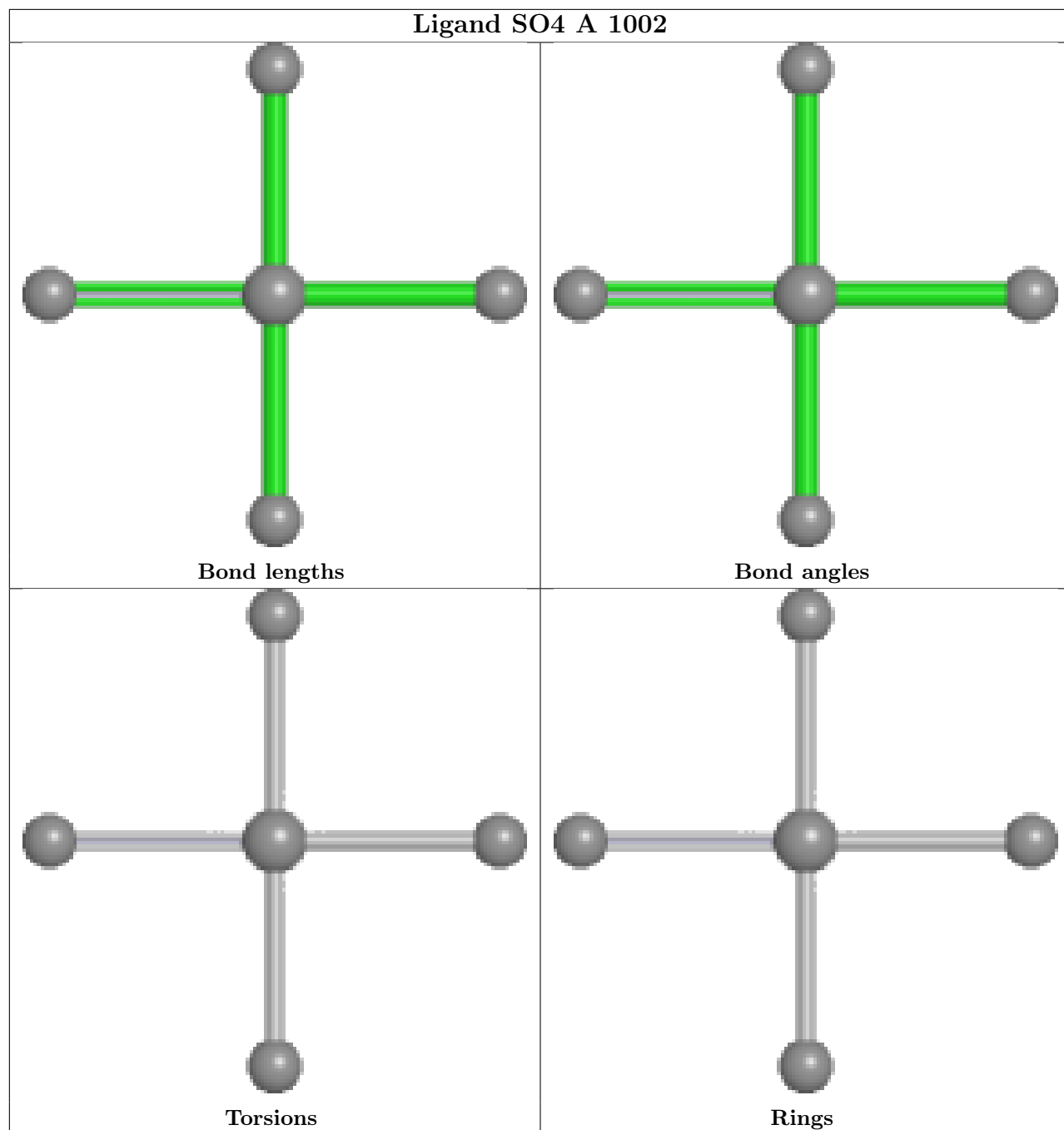
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

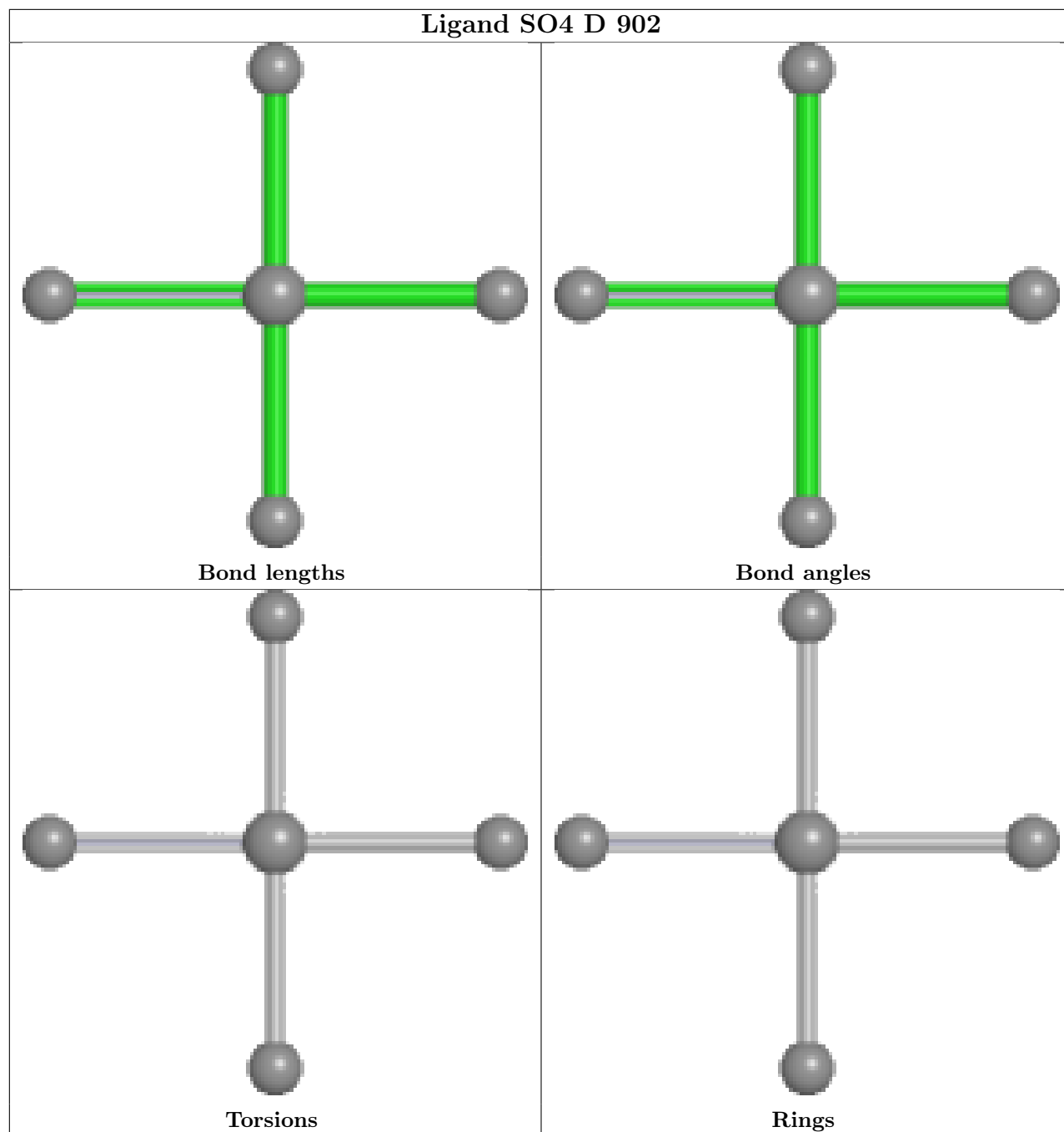












## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

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<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	388/425 (91%)	0.18	25 (6%) 25 26	8, 20, 42, 92	4 (1%)
1	B	384/425 (90%)	0.22	18 (4%) 36 38	8, 22, 39, 84	6 (1%)
1	C	404/425 (95%)	0.22	31 (7%) 19 20	7, 20, 45, 85	2 (0%)
1	D	399/425 (93%)	0.51	41 (10%) 12 12	9, 26, 50, 86	2 (0%)
All	All	1575/1700 (92%)	0.28	115 (7%) 21 21	7, 22, 45, 92	14 (0%)

All (115) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	447	ALA	6.7
1	A	590	ASN	6.6
1	D	844	ALA	6.2
1	A	460	LEU	6.0
1	D	449	TYR	5.7
1	C	445	ILE	5.7
1	D	461	ALA	5.2
1	A	456	TYR	5.1
1	A	458	ALA	4.9
1	B	460	LEU	4.9
1	B	461	ALA	4.8
1	B	590	ASN	4.8
1	B	587	VAL	4.4
1	A	843	THR	4.4
1	C	846	THR	4.3
1	A	589	ASN	4.2
1	A	457	GLN	4.2
1	A	761	SER	4.1
1	C	460	LEU	4.1
1	D	845	PRO	4.0
1	B	827	ASN	3.9

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	C	447	ALA	3.8
1	B	641	GLN	3.6
1	D	460	LEU	3.6
1	D	453	LEU	3.6
1	B	589	ASN	3.5
1	C	458	ALA	3.4
1	D	458	ALA	3.4
1	D	843	THR	3.4
1	A	461	ALA	3.4
1	C	589	ASN	3.4
1	B	463	TYR	3.4
1	B	842	PRO	3.4
1	B	628	TYR	3.3
1	A	842	PRO	3.3
1	C	449	TYR	3.2
1	B	467	LEU	3.2
1	C	463	TYR	3.2
1	D	450	GLU	3.2
1	D	681	GLU	3.1
1	C	751	LYS	3.1
1	A	628	TYR	3.0
1	C	455	LYS	3.0
1	D	714	LYS	3.0
1	D	448	ASP	3.0
1	D	579	ASP	3.0
1	A	587	VAL	2.9
1	A	763	ASP	2.9
1	D	842	PRO	2.9
1	C	579	ASP	2.9
1	C	847	LYS	2.9
1	D	619	ASN	2.9
1	B	462	LYS	2.9
1	C	840	VAL	2.8
1	D	452	LYS	2.8
1	A	641	GLN	2.8
1	D	581	ALA	2.8
1	D	590	ASN	2.8
1	D	456	TYR	2.8
1	A	840	VAL	2.7
1	D	564	SER	2.7
1	D	582	GLY	2.7
1	A	468	ALA	2.7

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	A	619	ASN	2.6
1	A	463	TYR	2.6
1	C	844	ALA	2.6
1	D	584	SER	2.6
1	C	544	ALA	2.6
1	B	459	ASP	2.6
1	D	463	TYR	2.6
1	D	684	LYS	2.6
1	D	578	GLY	2.5
1	C	444	ARG	2.5
1	C	448	ASP	2.5
1	D	763	ASP	2.5
1	D	663	GLN	2.5
1	B	466	ASP	2.5
1	C	845	PRO	2.5
1	D	451	ALA	2.5
1	B	565	ASN	2.4
1	B	464	GLN	2.4
1	A	565	ASN	2.4
1	A	464	GLN	2.4
1	B	469	ASP	2.4
1	D	753	SER	2.4
1	C	578	GLY	2.4
1	C	453	LEU	2.4
1	C	456	TYR	2.3
1	D	803	PRO	2.3
1	C	548	GLN	2.3
1	C	763	ASP	2.3
1	C	446	GLN	2.3
1	D	490	GLU	2.3
1	D	565	ASN	2.3
1	A	467	LEU	2.2
1	C	564	SER	2.2
1	C	684	LYS	2.2
1	A	762	SER	2.2
1	A	710	ASP	2.2
1	D	464	GLN	2.2
1	A	465	LYS	2.2
1	C	587	VAL	2.2
1	C	584	SER	2.2
1	B	761[A]	SER	2.2
1	D	454	ALA	2.1

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Mol	Chain	Res	Type	RSRZ
1	D	589	ASN	2.1
1	A	591	SER	2.1
1	C	565	ASN	2.1
1	D	687	ASN	2.1
1	D	591	SER	2.1
1	D	462	LYS	2.1
1	D	751	LYS	2.0
1	C	461	ALA	2.0
1	D	459	ASP	2.0
1	C	588	SER	2.0

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

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

## 6.3 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

## 6.4 Ligands [i](#)

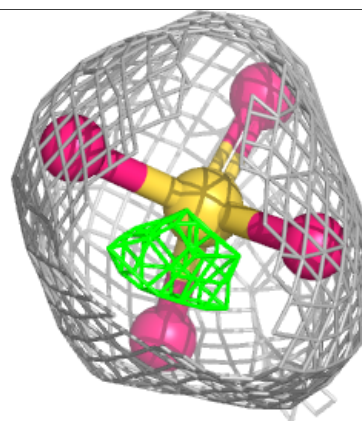
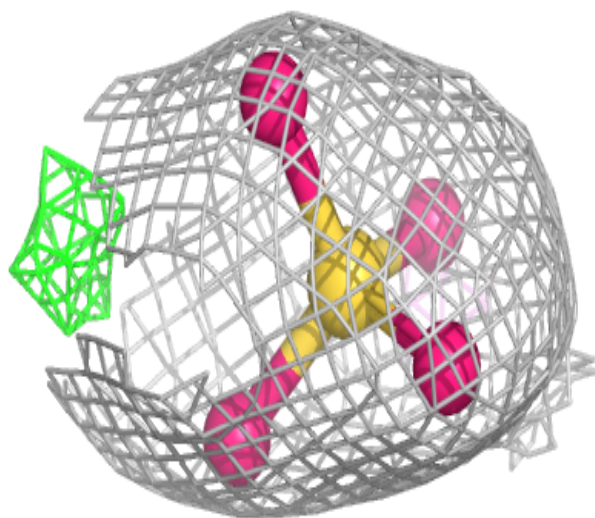
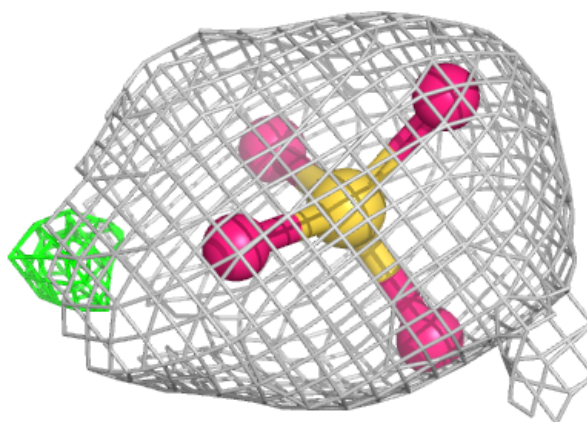
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
2	SO4	D	901	5/5	0.76	0.11	78,79,80,80	0
2	SO4	D	902	5/5	0.76	0.13	77,79,80,80	0
2	SO4	B	901	5/5	0.77	0.13	72,72,74,74	0
2	SO4	D	903	5/5	0.77	0.16	77,78,80,80	0
2	SO4	A	1002	5/5	0.88	0.10	61,62,63,64	0
2	SO4	A	1001	5/5	0.91	0.11	48,48,50,50	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.

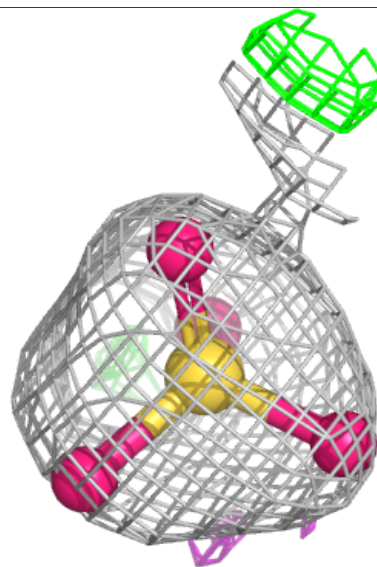
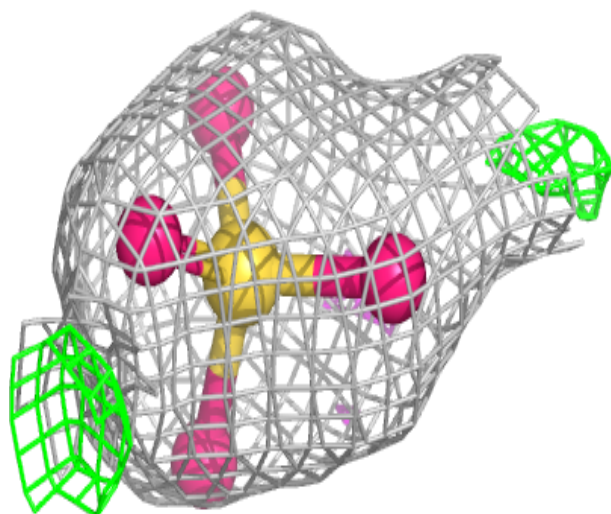
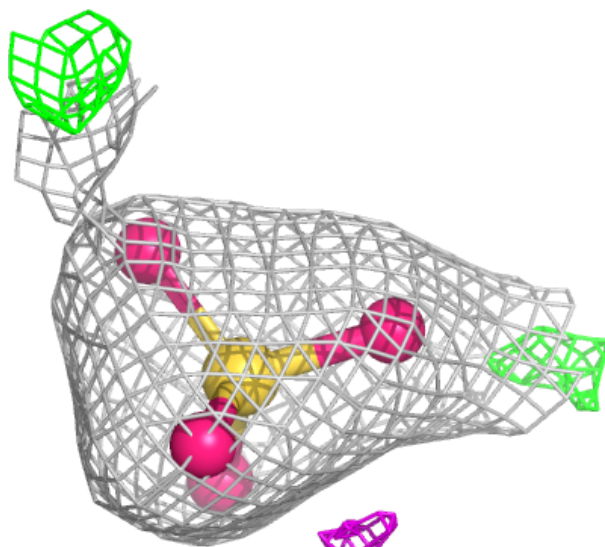
**Electron density around SO4 D 901:**

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



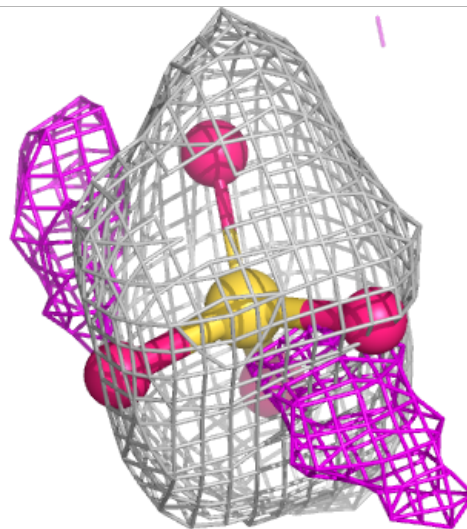
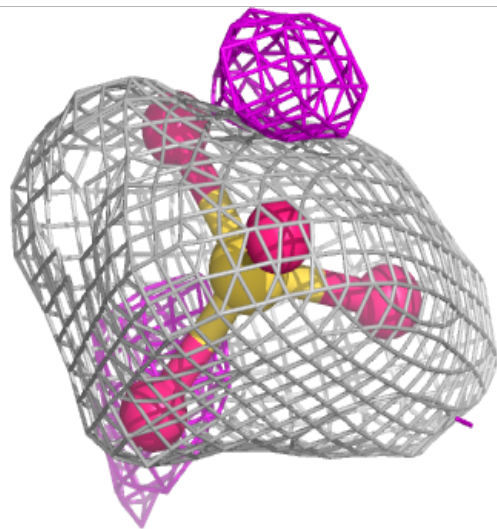
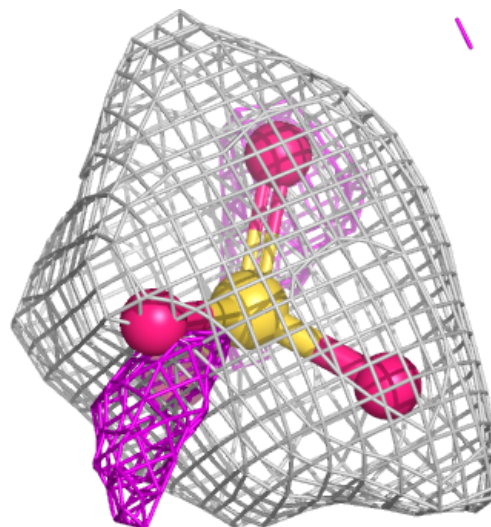
**Electron density around SO4 D 902:**

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



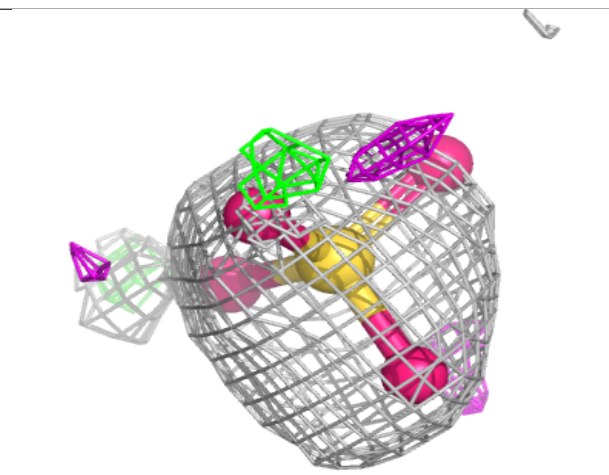
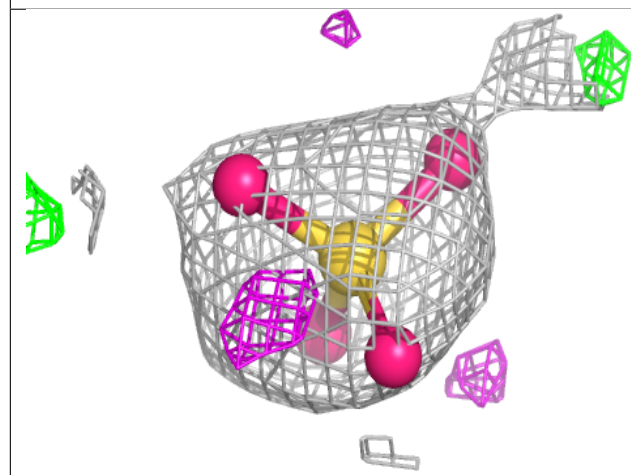
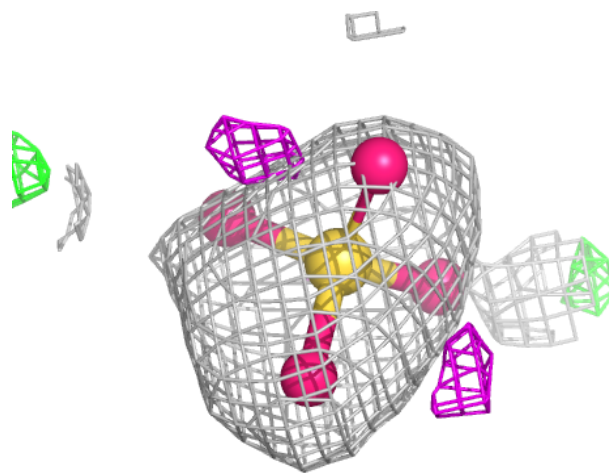
**Electron density around SO4 B 901:**

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



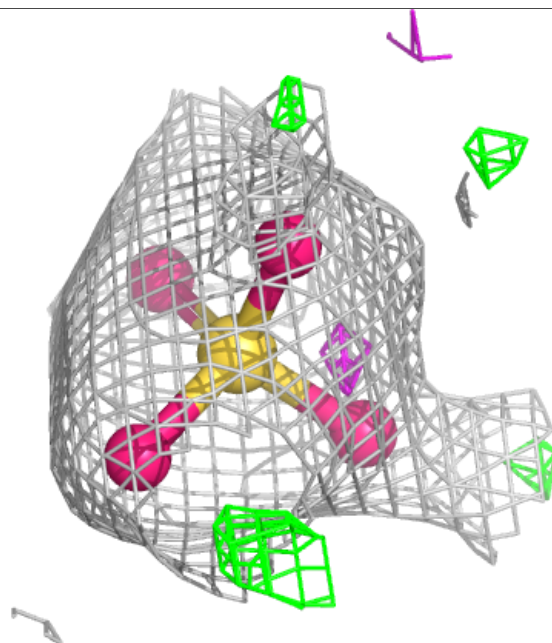
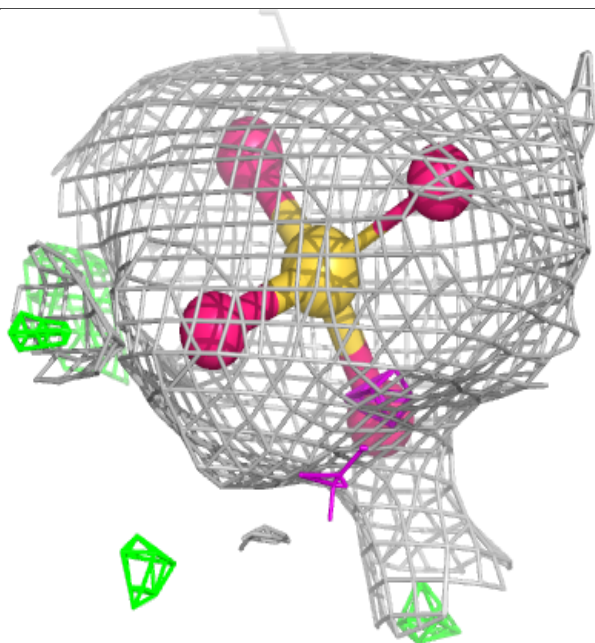
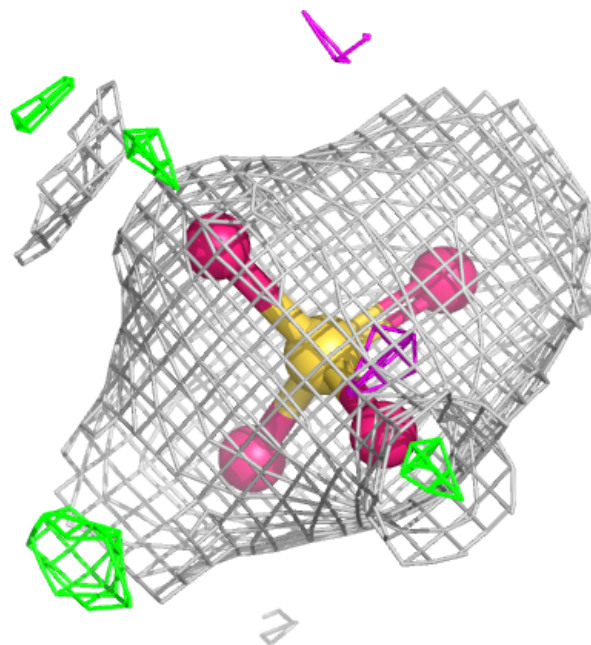
**Electron density around SO4 D 903:**

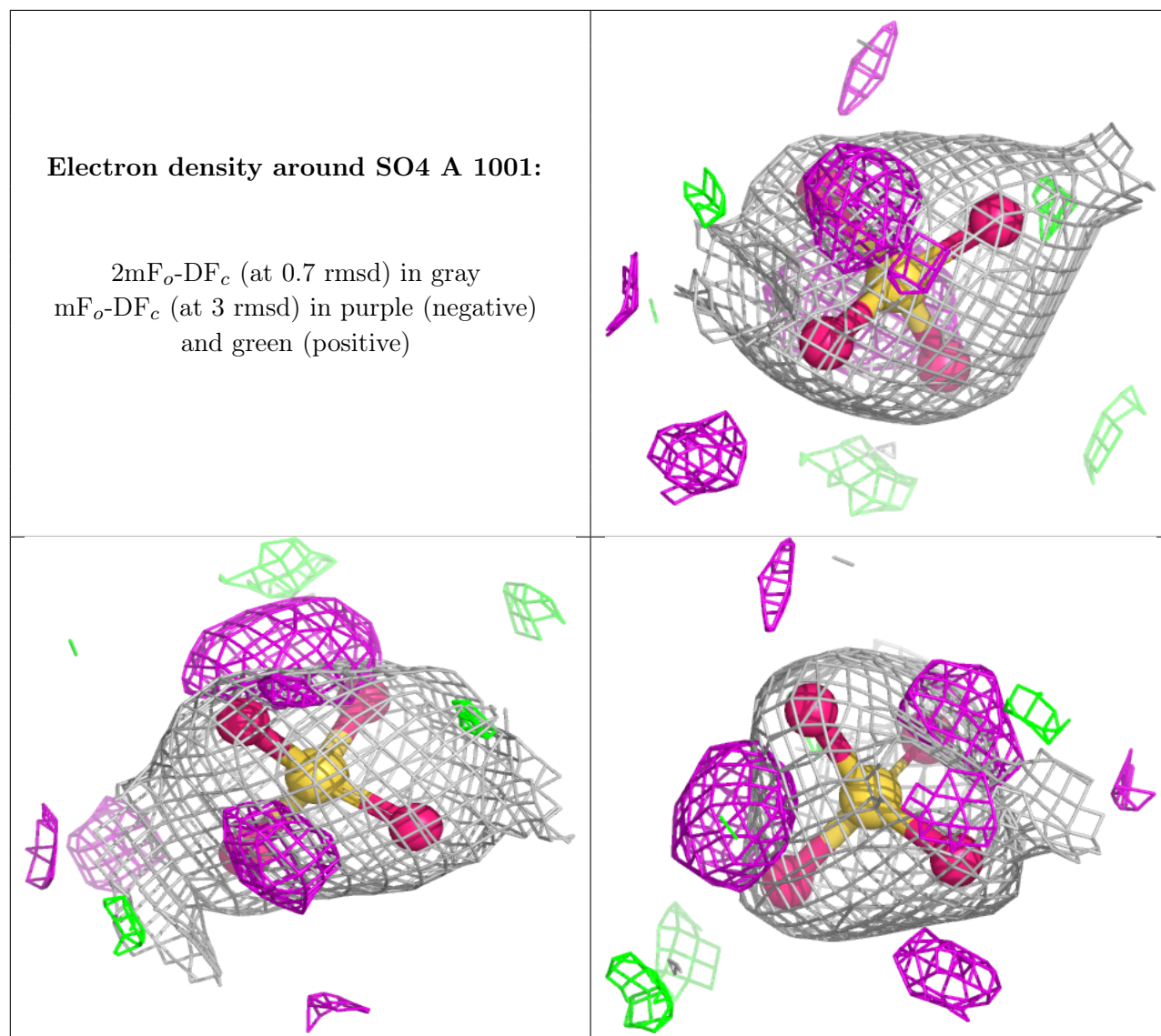
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



**Electron density around SO4 A 1002:**

$2mF_o-DF_c$  (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.