



Full wwPDB EM Validation Report ⓘ

Oct 21, 2025 – 04:23 PM JST

PDB ID : 8WPY / pdb_00008wp
EMDB ID : EMD-37726
Title : Cryo-EM structure of SARS-CoV-2 receptor-binding domain (RBD) complexed with CB6 mutant,S309, and S304 antibodies
Authors : Su, C.; Qi, J.X.; Gao, G.F.
Deposited on : 2023-10-10
Resolution : 3.02 Å(reported)

This is a Full wwPDB EM Validation Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>
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>.

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

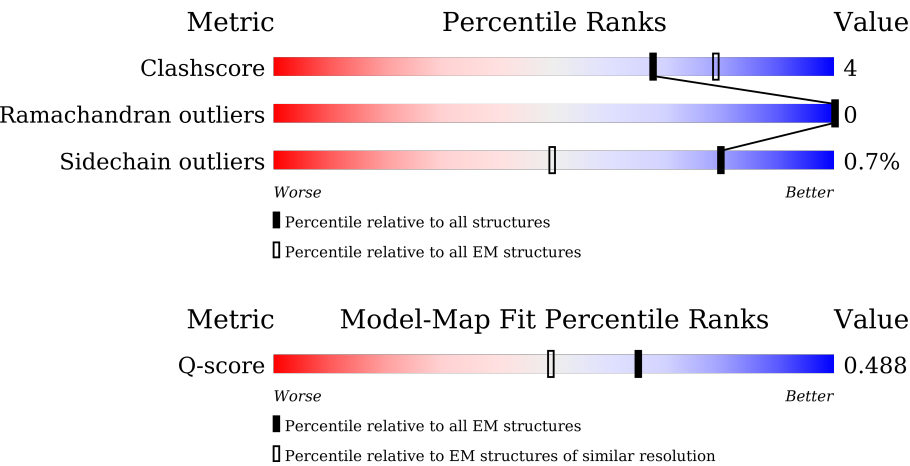
EMDB validation analysis : 0.0.1.dev129
Mogul : 1.8.5 (274361), CSD as541be (2020)
MolProbity : 4-5-2 with Phenix2.0
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ : 1.9.13
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 i

The following experimental techniques were used to determine the structure:
ELECTRON MICROSCOPY

The reported resolution of this entry is 3.02 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)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	210492	15764	-
Ramachandran outliers	207382	16835	-
Sidechain outliers	206894	16415	-
Q-score	-	25397	13913 (2.52 - 3.52)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the 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 $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion $< 40\%$). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	239	83%12%5%
2	B	215	87%12%
3	C	231	48%48%
4	D	216	46%50%

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Mol	Chain	Length	Quality of chain
5	H	232	 47% . 49%
6	L	216	 49% . 50%
7	R	229	 77% 8% 15%
8	E	4	 75% 25%

2 Entry composition

There are 8 unique types of molecules in this entry. The entry contains 8408 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, 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 S309 fab heavy chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	228	Total	C	N	O	S	0	0
			1715	1081	290	337	7		

- Molecule 2 is a protein called S309 fab light chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	212	Total	C	N	O	S	0	0
			1615	1006	276	329	4		

- Molecule 3 is a protein called CB6 fab mutant heavy chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	C	120	Total	C	N	O	S	0	0
			926	591	153	177	5		

- Molecule 4 is a protein called CB6 fab mutant light chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	D	108	Total	C	N	O	S	0	0
			823	519	133	168	3		

- Molecule 5 is a protein called S304 fab heavy chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	H	119	Total	C	N	O	S	0	0
			921	582	153	182	4		

- Molecule 6 is a protein called S304 fab light chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	L	108	Total	C	N	O	S	0	0
			816	516	133	164	3		

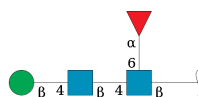
- Molecule 7 is a protein called Spike protein S1.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	R	195	Total	C	N	O	S	0	0
			1543	989	257	289	8		

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
R	542	HIS	-	expression tag	UNP P0DTC2
R	543	HIS	-	expression tag	UNP P0DTC2
R	544	HIS	-	expression tag	UNP P0DTC2
R	545	HIS	-	expression tag	UNP P0DTC2
R	546	HIS	-	expression tag	UNP P0DTC2
R	547	HIS	-	expression tag	UNP P0DTC2

- Molecule 8 is an oligosaccharide called beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-[alpha-L-fucopyranose-(1-6)]2-acetamido-2-deoxy-beta-D-glucopyranose.



Mol	Chain	Residues	Atoms				AltConf	Trace
8	E	4	Total	C	N	O	0	0
			49	28	2	19		

ARG
GLY
GLU
CYS
SER

• Molecule 5: S304 fab heavy chain

Chain H:  47% 49%

Q1 F29 W47 T50 D56 V63 R66 R71 L78 M82 L85 S119 SER ALA SER THR LYS GLY PRO SER VAL PHE PRO LEU ALA PRO SER SER LYS SER THR SER GLY THR ALA ALA LEU GLY CYS VAL LYS ASP THR PHE PRO PRO

VAL THR VAL TRP ASN SER GLY ALA LEU THR THR GLY VAL HIS THR PHE PRO ALA VAL LEU GLN SER SER GLY THR VAL THR VAL PRO SER SER SER LEU THR GLN THR TYR ILE CYS ASN VAL ASN HIS LYS PRO SER THR LYS VAL ASP LYS

ARG VAL GLU PRO LYS SER CYS ASP THR HIS HIS HIS HIS

• Molecule 6: S304 fab light chain

Chain L:  49% 50%

D1 Q6 P101 K108 ARG THR VAL ALA ALA PRO SER VAL PHE ILE THR PRO PRO ASP GLN LEU LYS SER GLY THR ALA SER VAL VAL VAL CYS LEU LEU ASN ASN PHE TYR PRO ARG GLU ALA LYS VAL THR TRP LYS VAL ASP VAL ASN ALA LEU GLN SER GLY ASN GLN

GLU SER VAL THR GLU ASP SER LYS ASP THR THR TYR SER LEU SER SER SER THR LEU LEU LEU SER ASP ALA ASP TYR GLU LYS HIS LYS VAL THR ALA VAL CYS GLU LEU THR THR HIS GLN PHE ASN ARG GLU CYS SER

• Molecule 7: Spike protein S1

Chain R:  77% 8% 15%

ARG VAL GLN THR GLU SER ILE VAL ARG PHE PRO ASN ILE T333 N334 F342 V350 K356 K357 T393 Y396 K417 N422 M439 S443 L455 F456 R457 S459 Y473 F486 Y505 H519 T523 F527 LYS LYS SER THR ASN LEU VAL

LYS ASN LYS CYS VAL ASN PHE HIS HIS HIS HIS HIS HIS

• Molecule 8: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-[alpha-L-fucopyranose-(1-6)]2-acetamido-2-deoxy-beta-D-glucopyranose

Chain E:  75% 25%

MAG1 MAG2 ENA3 FUC4

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	205618	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING ONLY	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	1.791	Depositor
Minimum map value	-0.002	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.019	Depositor
Recommended contour level	0.0045	Depositor
Map size ($\text{\AA}$)	306.0, 306.0, 306.0	wwPDB
Map dimensions	360, 360, 360	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing ($\text{\AA}$)	0.85, 0.85, 0.85	Depositor

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: NAG, FUC, BMA

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	0.11	0/1758	0.25	0/2395
2	B	0.13	0/1648	0.27	0/2238
3	C	0.11	0/948	0.26	0/1289
4	D	0.13	0/842	0.33	0/1144
5	H	0.11	0/944	0.24	0/1280
6	L	0.11	0/835	0.31	0/1135
7	R	0.11	0/1587	0.26	0/2161
All	All	0.12	0/8562	0.27	0/11642

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 [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	1715	0	1673	17	0
2	B	1615	0	1576	17	0
3	C	926	0	896	7	0
4	D	823	0	799	8	0
5	H	921	0	864	6	0
6	L	816	0	799	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
7	R	1543	0	1459	12	0
8	E	49	0	43	1	0
All	All	8408	0	8109	60	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 4.

All (60) 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)
3:C:104:TYR:H	4:D:91:SER:HB2	1.64	0.62
1:A:51:ILE:HD13	1:A:72:THR:HG23	1.83	0.61
2:B:114:SER:H	2:B:137:ASN:HB2	1.65	0.61
2:B:149:LYS:HB2	2:B:193:ALA:HB3	1.86	0.57
2:B:186:TYR:O	2:B:192:TYR:OH	2.21	0.57
5:H:29:PHE:O	5:H:71:ARG:NH1	2.32	0.57
3:C:13:GLN:NE2	3:C:120:ALA:O	2.35	0.56
3:C:82:MET:HB3	3:C:85:LEU:HD21	1.89	0.55
6:L:6:GLN:HG3	6:L:101:PRO:HD2	1.89	0.54
1:A:67:ARG:HB3	1:A:85:ARG:HH21	1.73	0.54
2:B:189:HIS:O	2:B:211:ARG:NE	2.41	0.54
2:B:128:GLY:HA2	2:B:183:LYS:HE3	1.89	0.54
7:R:439:ASN:O	7:R:443:SER:OG	2.21	0.53
4:D:61:ARG:NH2	4:D:82:ASP:OD1	2.37	0.53
7:R:342:PHE:HB2	8:E:1:NAG:H82	1.91	0.53
5:H:47:TRP:NE1	5:H:50:THR:OG1	2.39	0.53
2:B:151:ASP:HA	2:B:191:VAL:HB	1.90	0.52
1:A:35:SER:OG	1:A:99:ASP:OD2	2.28	0.52
2:B:114:SER:O	2:B:137:ASN:ND2	2.32	0.51
1:A:161:PRO:HD2	1:A:214:HIS:HE2	1.75	0.51
1:A:209:ILE:HD11	1:A:222:ASP:HB3	1.93	0.51
4:D:4:MET:SD	4:D:90:GLN:HB2	2.51	0.51
4:D:92:SER:HG	7:R:505:TYR:HH	1.56	0.51
1:A:160:PHE:HB3	1:A:161:PRO:HD3	1.93	0.49
4:D:90:GLN:HE21	4:D:92:SER:HB3	1.76	0.49
5:H:56:ASP:OD1	5:H:56:ASP:N	2.37	0.49
4:D:92:SER:OG	7:R:505:TYR:OH	2.23	0.48
5:H:29:PHE:HZ	5:H:78:LEU:HB2	1.78	0.48
7:R:333:THR:OG1	7:R:334:ASN:N	2.46	0.47
1:A:138:LEU:HD13	2:B:133:VAL:HG11	1.96	0.47
4:D:4:MET:HE3	4:D:25:ALA:HB2	1.96	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:21:LEU:HD22	2:B:102:THR:HG21	1.97	0.47
1:A:51:ILE:HG13	1:A:58:THR:HG22	1.96	0.47
2:B:124:GLN:HE22	2:B:131:SER:HB3	1.80	0.47
2:B:190:LYS:HA	2:B:211:ARG:HE	1.79	0.47
7:R:417:LYS:HE2	7:R:455:LEU:HD23	1.97	0.46
2:B:195:GLU:OE2	2:B:197:THR:OG1	2.32	0.46
3:C:24:ALA:HB1	3:C:27:PHE:HB2	1.98	0.46
1:A:106:PHE:CE2	7:R:356:LYS:HD3	2.51	0.46
7:R:457:ARG:NH1	7:R:459:SER:O	2.41	0.46
5:H:82:MET:HB3	5:H:85:LEU:HD21	1.98	0.45
5:H:63:VAL:HG12	5:H:66:ARG:HH21	1.81	0.45
1:A:97:ALA:HB1	1:A:114:PHE:HB3	1.99	0.45
2:B:149:LYS:HE2	2:B:195:GLU:HB2	1.99	0.45
1:A:115:ASP:OD1	1:A:115:ASP:N	2.51	0.44
7:R:393:THR:O	7:R:523:THR:OG1	2.36	0.43
1:A:112:GLY:HA2	2:B:50:TYR:HB2	2.01	0.43
2:B:151:ASP:OD1	2:B:191:VAL:N	2.37	0.42
1:A:40:ALA:HB3	1:A:43:GLN:HB2	2.00	0.42
2:B:147:GLN:NE2	2:B:154:LEU:HB3	2.35	0.42
3:C:107:ASP:OD1	3:C:107:ASP:N	2.39	0.42
7:R:350:VAL:HG22	7:R:422:ASN:HB3	2.02	0.42
1:A:147:GLY:HA2	1:A:148:GLY:HA2	1.74	0.41
2:B:39:GLN:O	2:B:85:ALA:HB1	2.21	0.41
1:A:53:THR:HG22	1:A:72:THR:HG21	2.01	0.41
1:A:169:ASN:O	1:A:169:ASN:ND2	2.48	0.41
3:C:109:TRP:CE3	4:D:44:PRO:HD2	2.56	0.41
7:R:357:ARG:NH1	7:R:396:TYR:OH	2.54	0.41
1:A:153:GLY:HA2	1:A:168:TRP:HZ2	1.86	0.40
3:C:31:TYR:O	7:R:473:TYR:OH	2.29	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 PDB entries followed by that with respect to all EM entries.

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	226/239 (95%)	224 (99%)	2 (1%)	0	100	100
2	B	210/215 (98%)	202 (96%)	8 (4%)	0	100	100
3	C	118/231 (51%)	115 (98%)	3 (2%)	0	100	100
4	D	106/216 (49%)	99 (93%)	7 (7%)	0	100	100
5	H	117/232 (50%)	117 (100%)	0	0	100	100
6	L	106/216 (49%)	103 (97%)	3 (3%)	0	100	100
7	R	193/229 (84%)	187 (97%)	6 (3%)	0	100	100
All	All	1076/1578 (68%)	1047 (97%)	29 (3%)	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 PDB entries followed by that with respect to all EM entries.

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	190/201 (94%)	186 (98%)	4 (2%)	48	76
2	B	183/186 (98%)	182 (100%)	1 (0%)	86	94
3	C	99/197 (50%)	99 (100%)	0	100	100
4	D	93/190 (49%)	93 (100%)	0	100	100
5	H	96/195 (49%)	96 (100%)	0	100	100
6	L	92/189 (49%)	92 (100%)	0	100	100
7	R	168/202 (83%)	167 (99%)	1 (1%)	84	92
All	All	921/1360 (68%)	915 (99%)	6 (1%)	80	91

All (6) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	11	VAL
1	A	169	ASN
1	A	203	LEU
1	A	210	CYS

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Mol	Chain	Res	Type
2	B	3	VAL
7	R	486	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (8) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	6	GLN
1	A	116	ASN
4	D	37	GLN
4	D	90	GLN
5	H	39	GLN
6	L	6	GLN
7	R	360	ASN
7	R	437	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 ⓘ

4 monosaccharides 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	$\# Z > 2$
8	NAG	E	1	8,7	14,14,15	0.23	0	17,19,21	0.54	0
8	NAG	E	2	8	14,14,15	0.20	0	17,19,21	0.43	0
8	BMA	E	3	8	11,11,12	0.49	0	15,15,17	0.76	0
8	FUC	E	4	8	10,10,11	0.76	0	14,14,16	0.94	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
8	NAG	E	1	8,7	-	2/6/23/26	0/1/1/1
8	NAG	E	2	8	-	0/6/23/26	0/1/1/1
8	BMA	E	3	8	-	0/2/19/22	0/1/1/1
8	FUC	E	4	8	-	-	0/1/1/1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (2) torsion outliers are listed below:

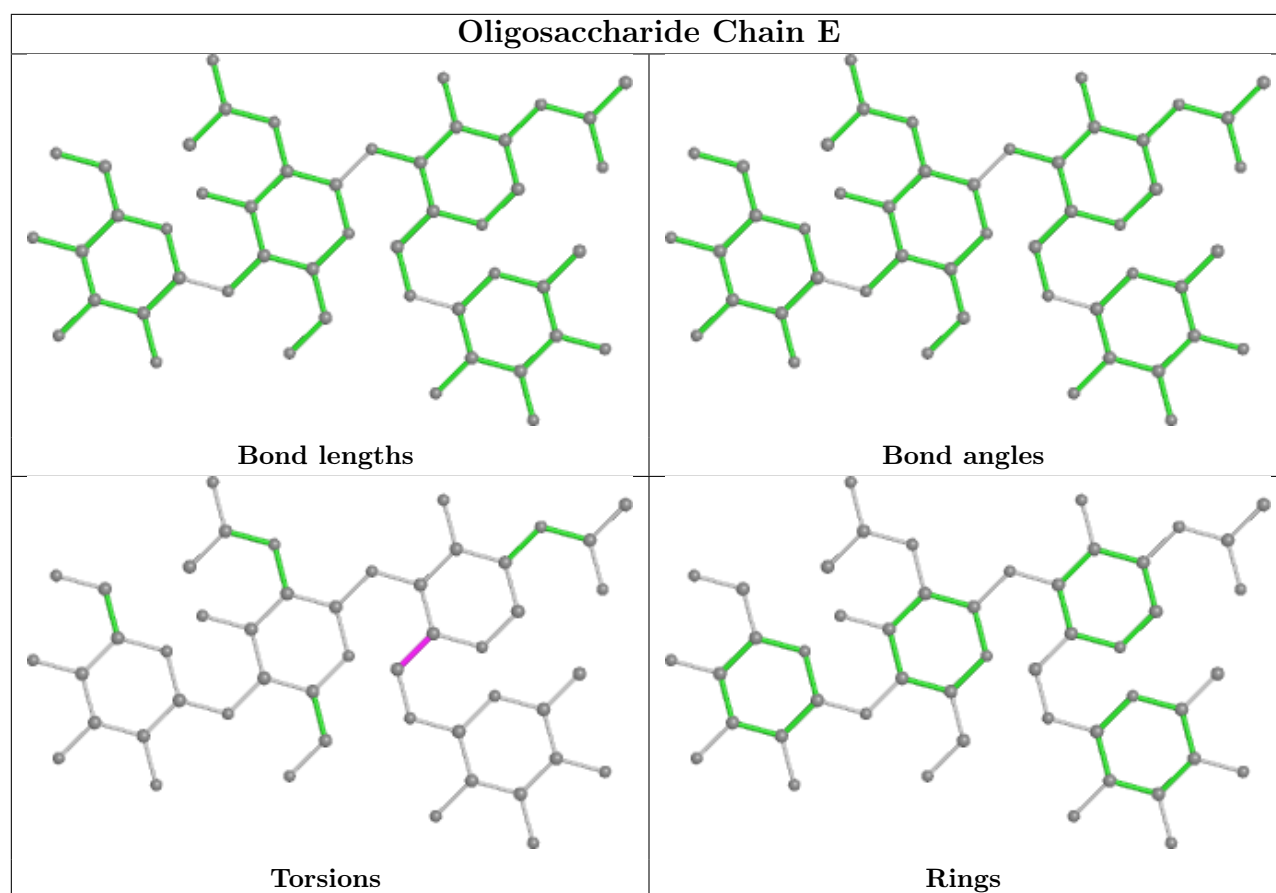
Mol	Chain	Res	Type	Atoms
8	E	1	NAG	O5-C5-C6-O6
8	E	1	NAG	C4-C5-C6-O6

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
8	E	1	NAG	1	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.



5.6 Ligand geometry [i](#)

There are no ligands in this entry.

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.

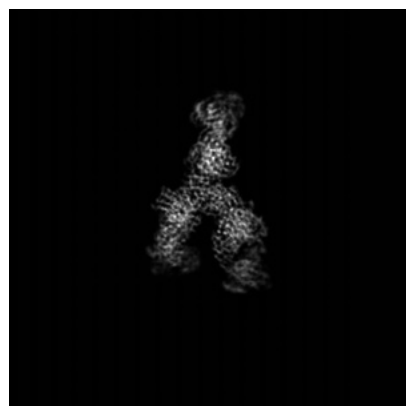
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-37726. These allow visual inspection of the internal detail of the map and identification of artifacts.

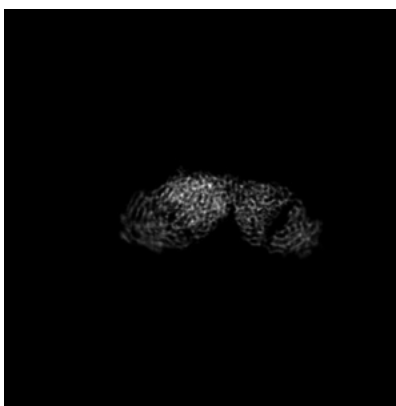
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

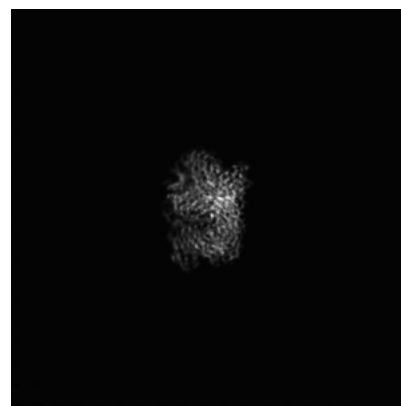
6.1.1 Primary map



X

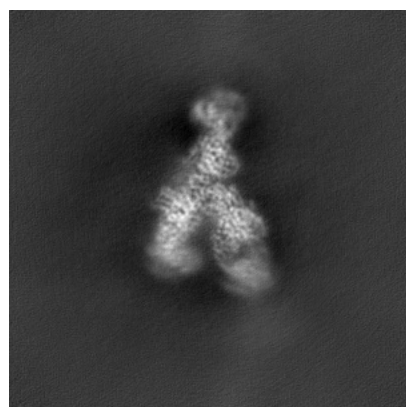


Y

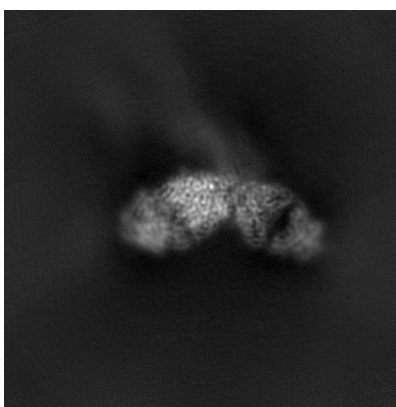


Z

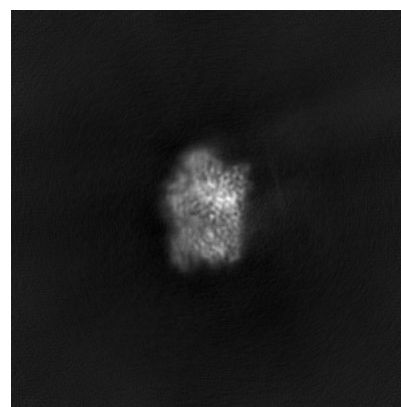
6.1.2 Raw map



X



Y



Z

The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

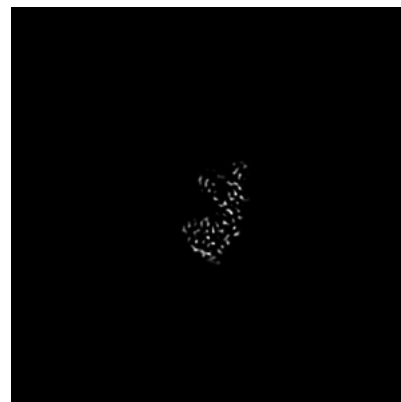
6.2.1 Primary map



X Index: 180

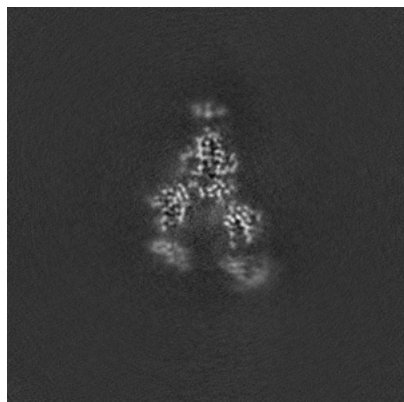


Y Index: 180

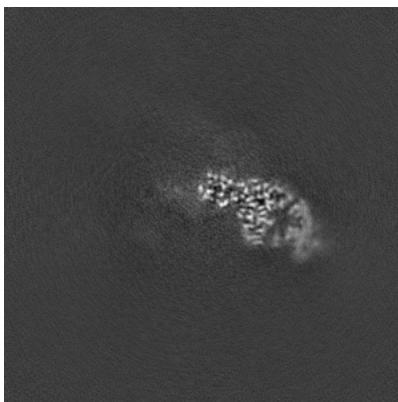


Z Index: 180

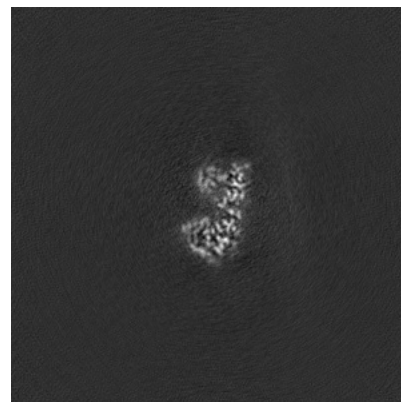
6.2.2 Raw map



X Index: 180



Y Index: 180



Z Index: 180

The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

6.3.1 Primary map



X Index: 186

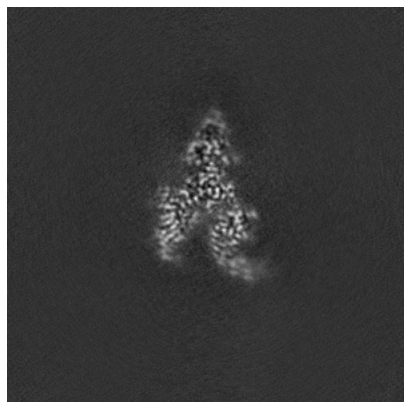


Y Index: 190

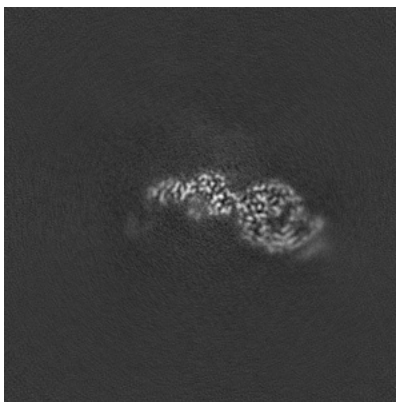


Z Index: 179

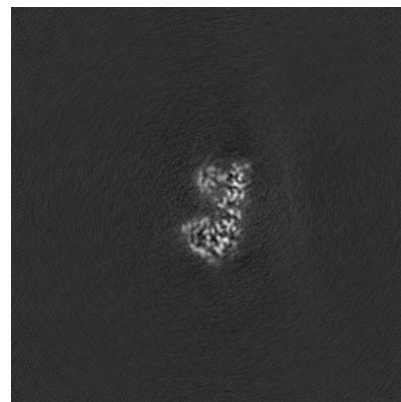
6.3.2 Raw map



X Index: 189



Y Index: 189

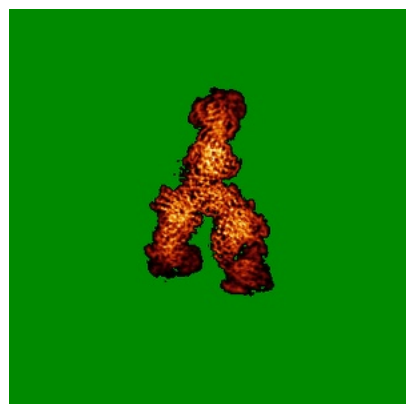


Z Index: 180

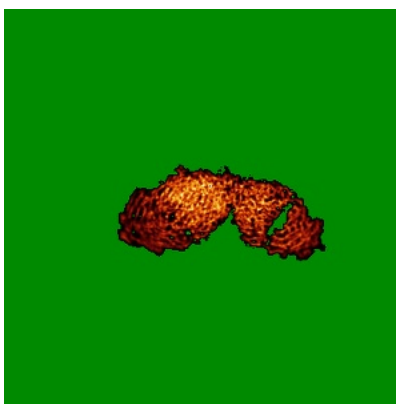
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color) ⓘ

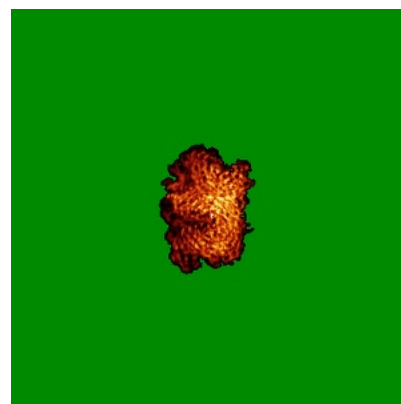
6.4.1 Primary map



X



Y

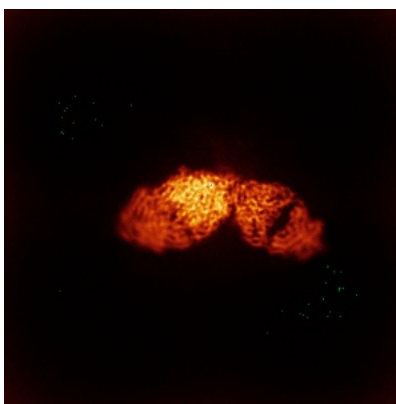


Z

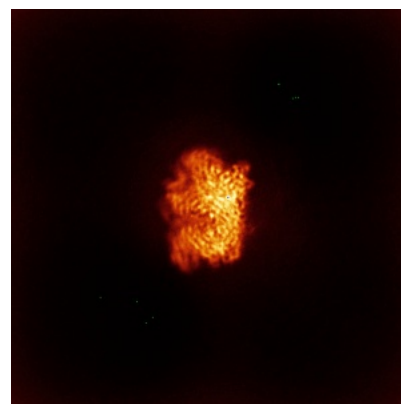
6.4.2 Raw map



X



Y



Z

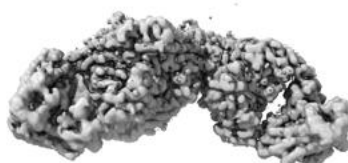
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views [i](#)

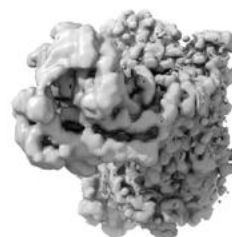
6.5.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.0045. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

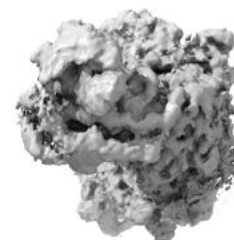
6.5.2 Raw map



X



Y



Z

These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

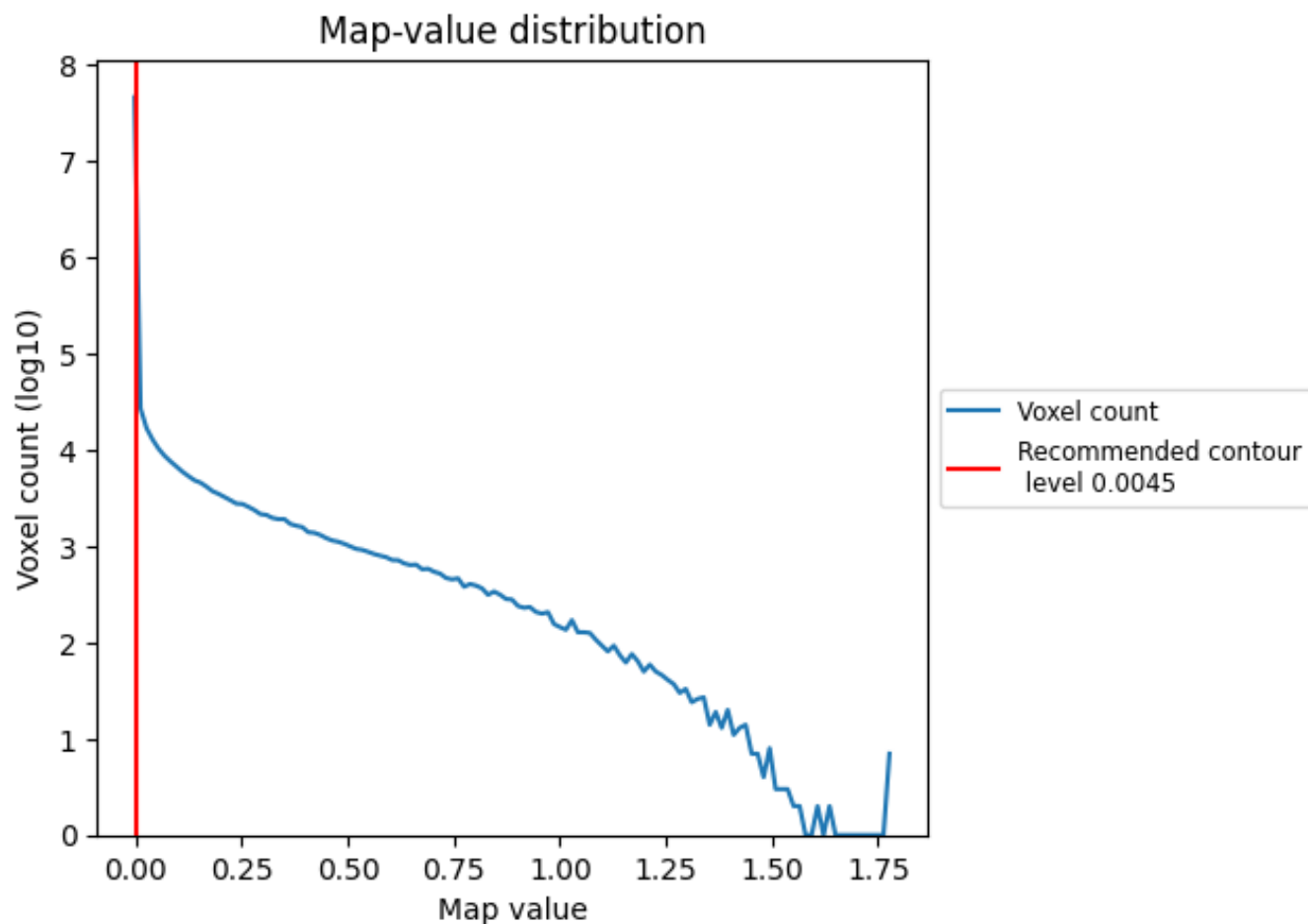
6.6 Mask visualisation [i](#)

This section was not generated. No masks/segmentation were deposited.

7 Map analysis [i](#)

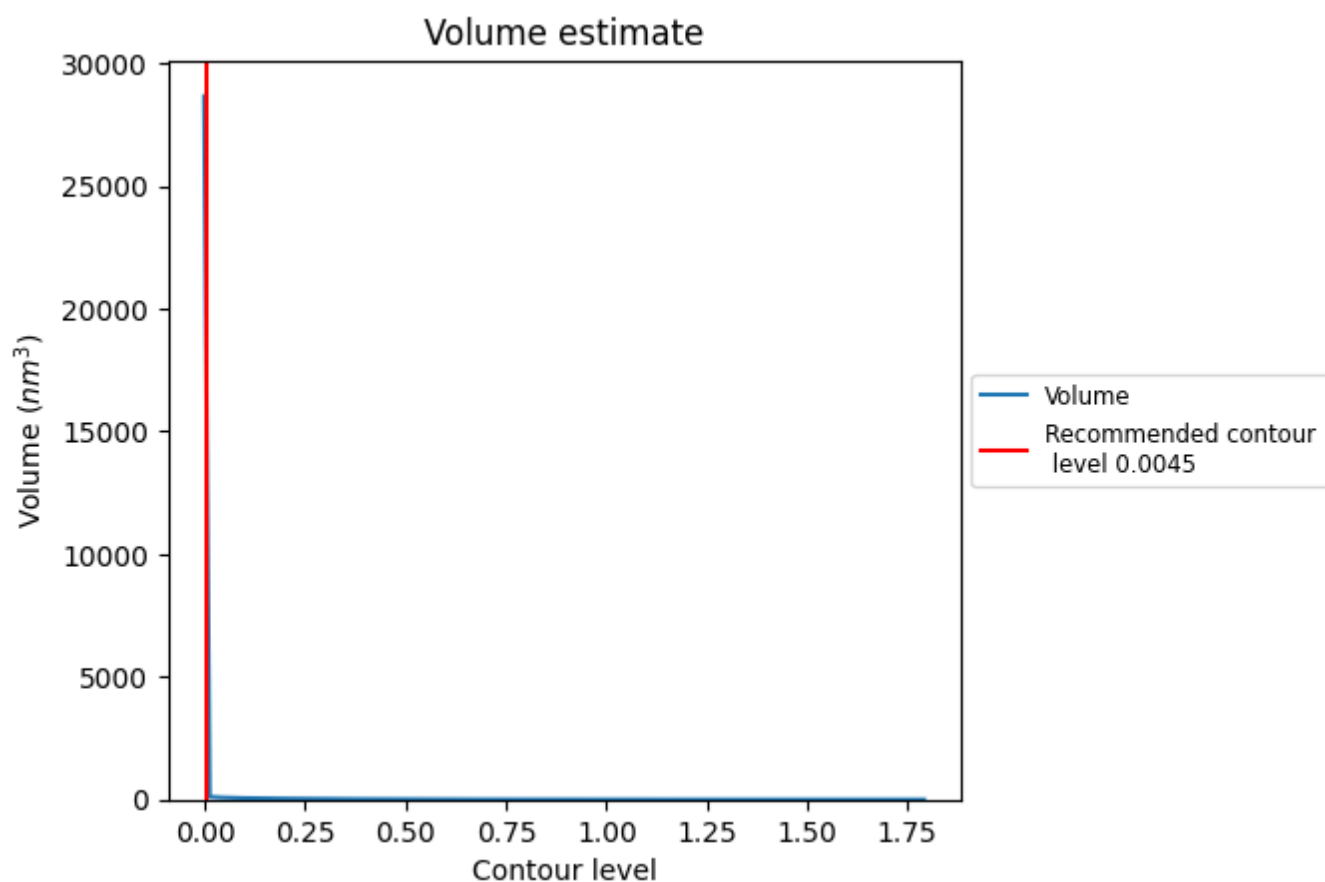
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

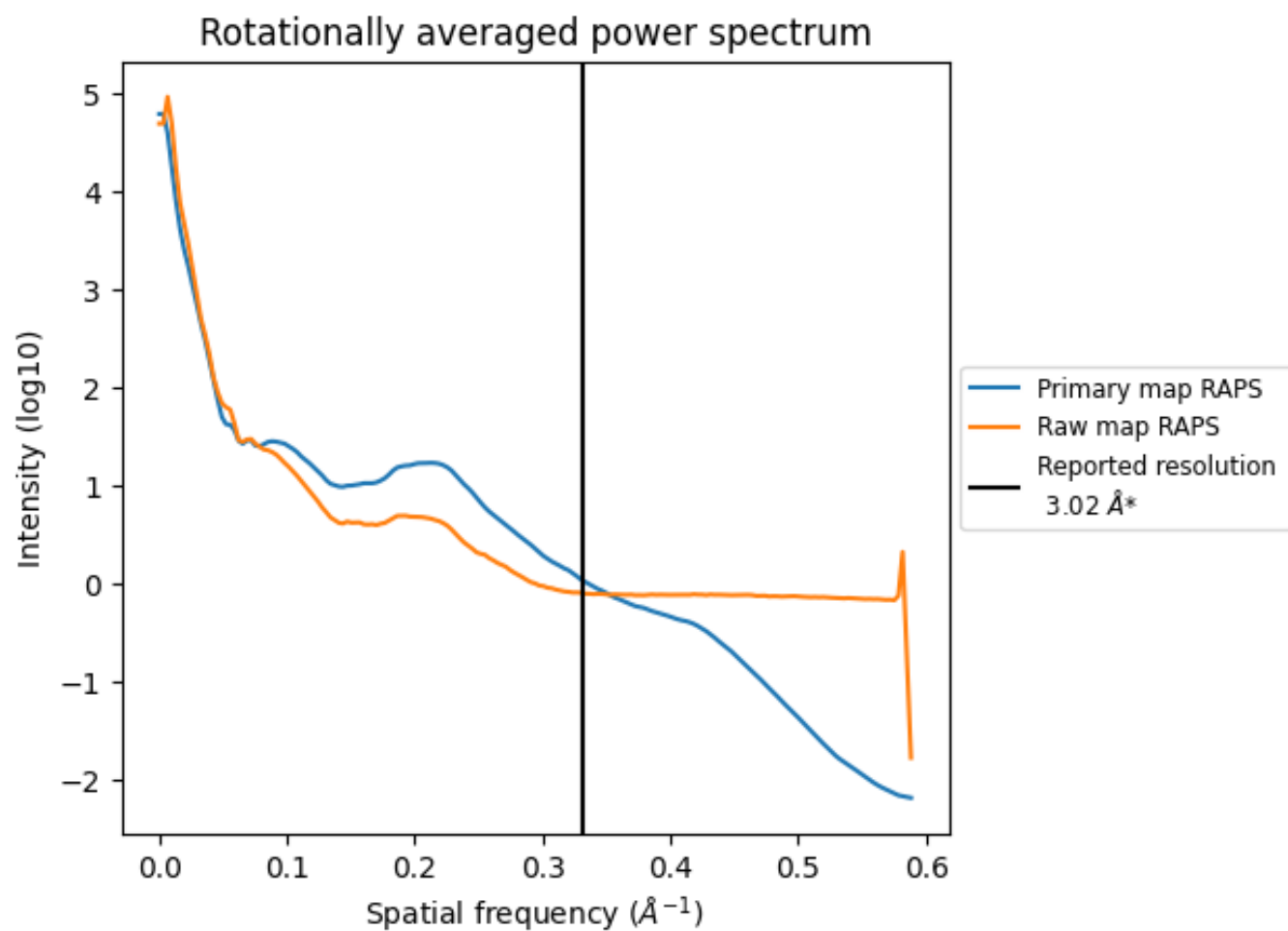
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 15857 nm^3 ; this corresponds to an approximate mass of 14324 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.

7.3 Rotationally averaged power spectrum ⓘ

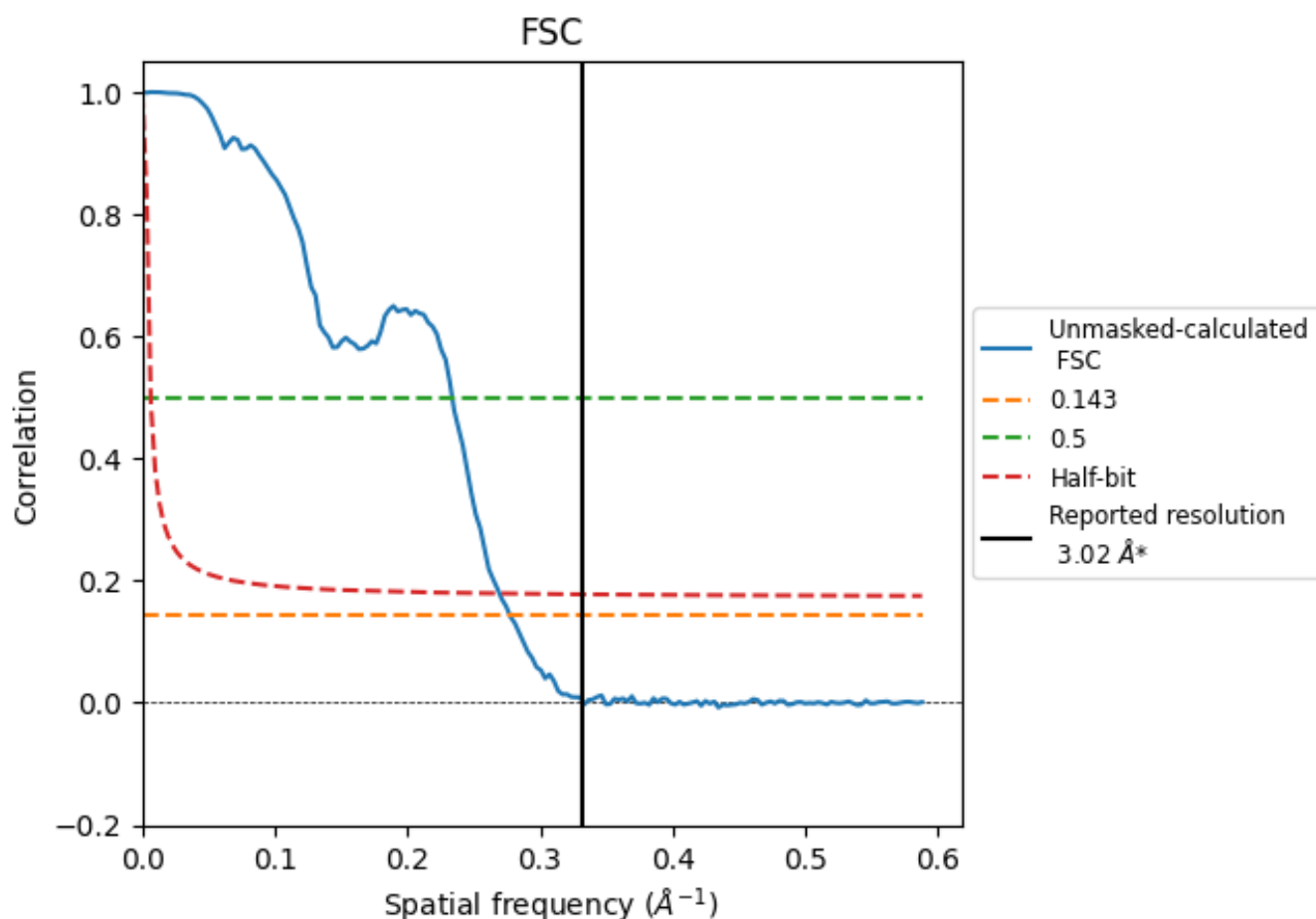


*Reported resolution corresponds to spatial frequency of $0.331 \text{ \AA}^{-1}$

8 Fourier-Shell correlation [i](#)

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of 0.331 $\text{\AA}^{-1}$

8.2 Resolution estimates [i](#)

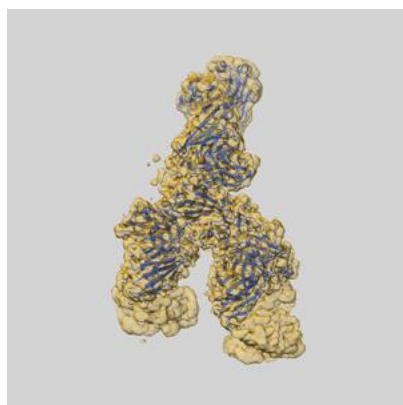
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.02	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	3.61	4.28	3.71

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 3.61 differs from the reported value 3.02 by more than 10 %

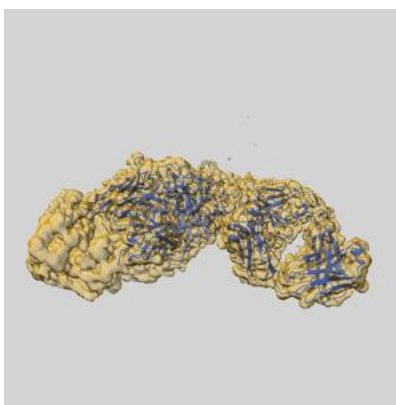
9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-37726 and PDB model 8WPY. Per-residue inclusion information can be found in [section 3](#) on [page 6](#).

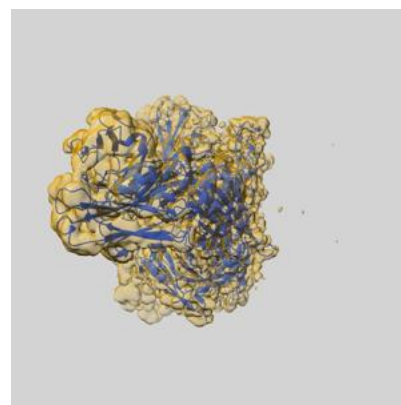
9.1 Map-model overlay [i](#)



X



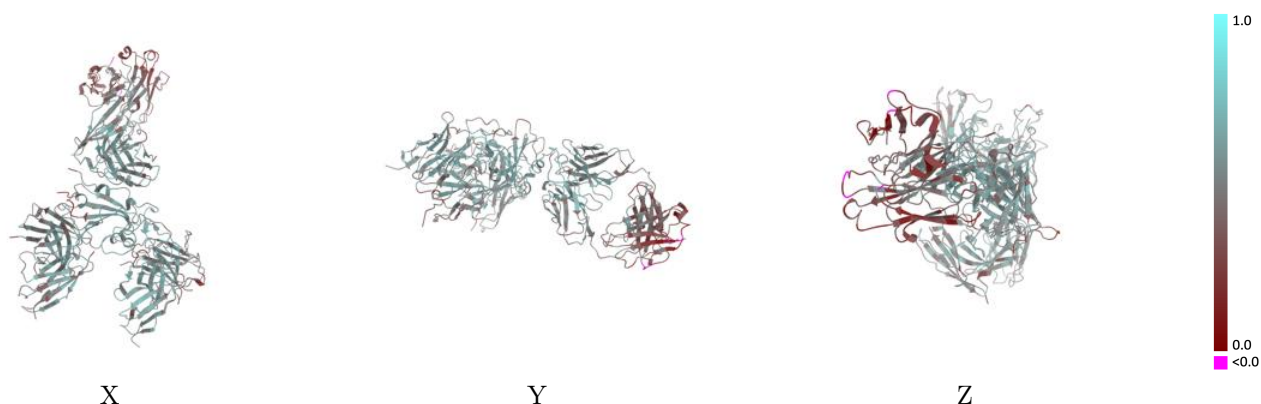
Y



Z

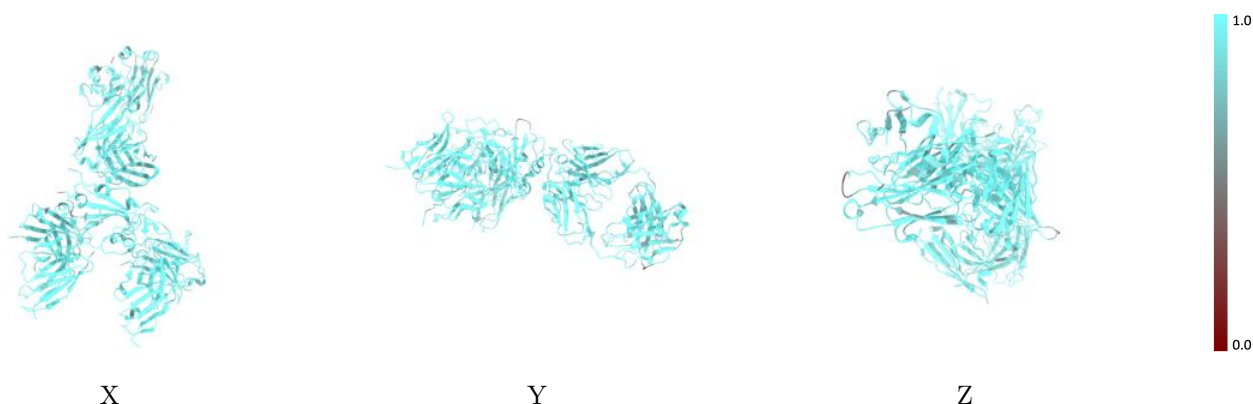
The images above show the 3D surface view of the map at the recommended contour level 0.0045 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2 Q-score mapped to coordinate model [i](#)



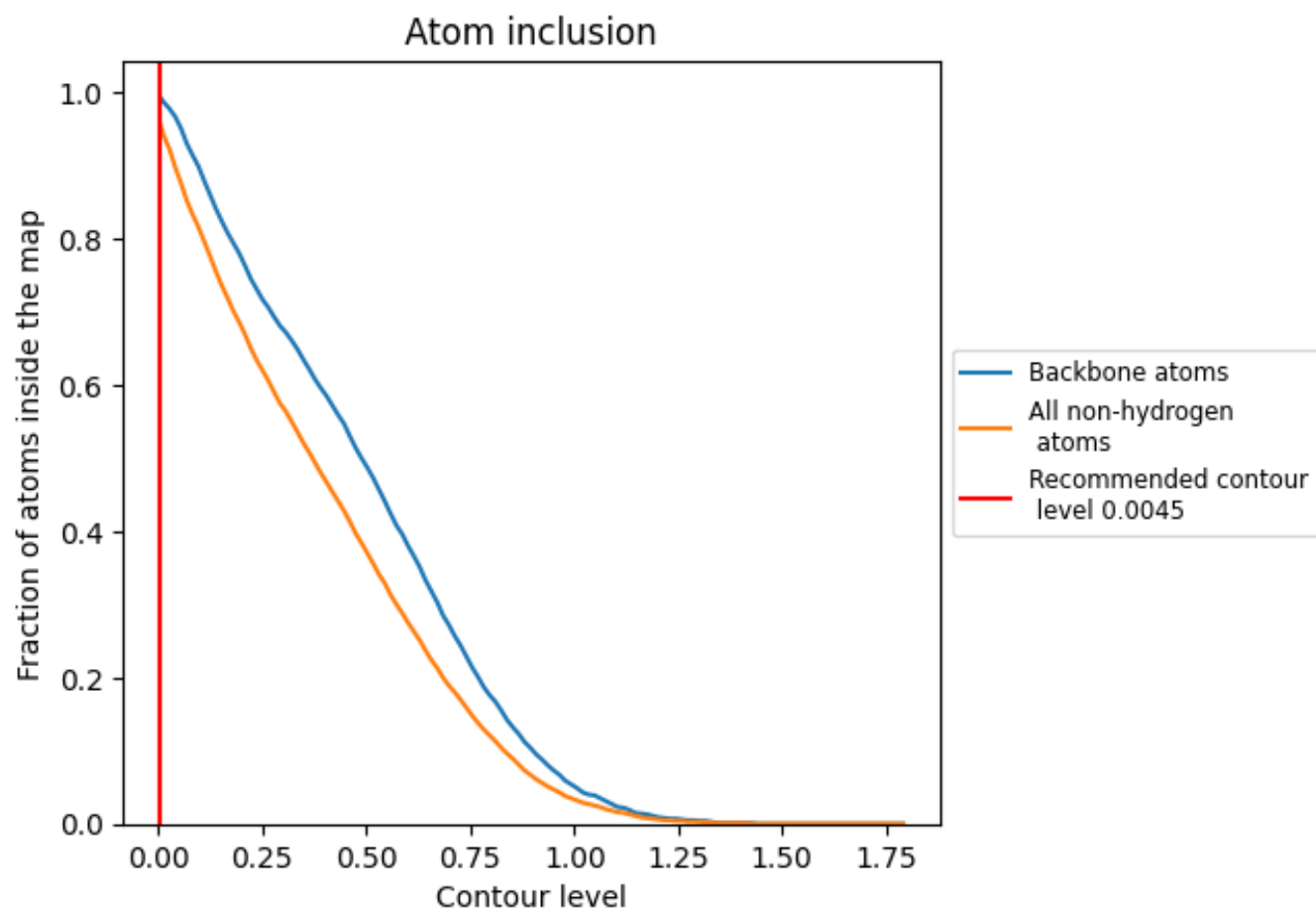
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions at which atoms can be resolved. Low Q-score values may therefore be expected for many entries.

9.3 Atom inclusion mapped to coordinate model [i](#)



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.0045).

9.4 Atom inclusion ⓘ



At the recommended contour level, 99% of all backbone atoms, 96% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary ⓘ

The table lists the average atom inclusion at the recommended contour level (0.0045) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.9570	0.4880
A	0.9420	0.4490
B	0.9380	0.4200
C	0.9810	0.5490
D	0.9510	0.4660
E	1.0000	0.5180
H	0.9650	0.5090
L	0.9710	0.5240
R	0.9700	0.5450

