



Full wwPDB EM Validation Report ⓘ

Sep 30, 2025 – 01:53 pm BST

PDB ID : 8REW / pdb_00008rew
EMDB ID : EMD-19110
Title : CryoEM structure of human GARP-ITGFbeta1 in complex with a Fab fragment derived from an activating antibody.
Authors : Felix, J.; Lambert, F.; Marien, L.; van der Woning, B.; Savvides, S.N.; Lucas, S.
Deposited on : 2023-12-12
Resolution : 2.98 Å (reported)
Based on initial model : 6GFF

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 : 1.8.4, 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

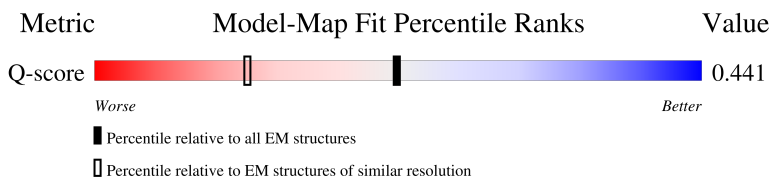
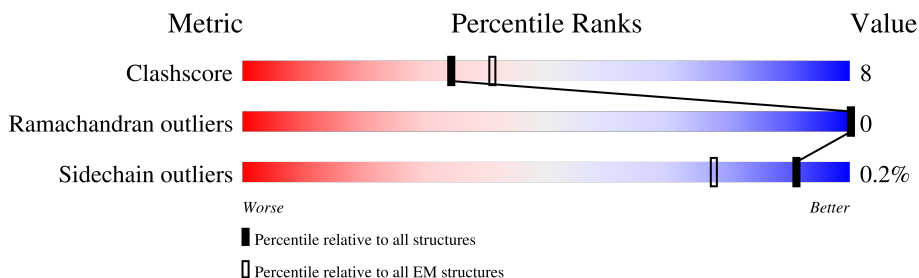
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 2.98 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	13236 (2.48 - 3.48)

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	390	
1	B	390	
1	C	390	
1	D	390	

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Mol	Chain	Length	Quality of chain
2	E	674	
3	F	238	
3	I	238	
4	G	247	
4	H	247	
5	J	4	
5	K	4	
6	L	2	

2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 12428 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 Transforming growth factor beta-1.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	210	Total	C	N	O	S	0	0
			1642	1044	292	299	7		
1	B	104	Total	C	N	O	S	0	0
			815	525	136	144	10		
1	C	208	Total	C	N	O	S	0	0
			1649	1046	292	304	7		
1	D	107	Total	C	N	O	S	0	0
			815	523	136	146	10		

- Molecule 2 is a protein called Transforming growth factor beta activator LRRC32.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	E	510	Total	C	N	O	S	0	0
			3795	2417	647	717	14		

There are 46 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
E	629	GLU	-	expression tag	UNP Q14392
E	630	ALA	-	expression tag	UNP Q14392
E	631	ALA	-	expression tag	UNP Q14392
E	632	ALA	-	expression tag	UNP Q14392
E	633	GLU	-	expression tag	UNP Q14392
E	634	ASN	-	expression tag	UNP Q14392
E	635	LEU	-	expression tag	UNP Q14392
E	636	TYR	-	expression tag	UNP Q14392
E	637	PHE	-	expression tag	UNP Q14392
E	638	GLN	-	expression tag	UNP Q14392
E	639	GLY	-	expression tag	UNP Q14392
E	640	ALA	-	expression tag	UNP Q14392
E	641	ALA	-	expression tag	UNP Q14392
E	642	TRP	-	expression tag	UNP Q14392
E	643	SER	-	expression tag	UNP Q14392

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Chain	Residue	Modelled	Actual	Comment	Reference
E	644	HIS	-	expression tag	UNP Q14392
E	645	PRO	-	expression tag	UNP Q14392
E	646	GLN	-	expression tag	UNP Q14392
E	647	PHE	-	expression tag	UNP Q14392
E	648	GLU	-	expression tag	UNP Q14392
E	649	LYS	-	expression tag	UNP Q14392
E	650	GLY	-	expression tag	UNP Q14392
E	651	ALA	-	expression tag	UNP Q14392
E	652	ALA	-	expression tag	UNP Q14392
E	653	TRP	-	expression tag	UNP Q14392
E	654	SER	-	expression tag	UNP Q14392
E	655	HIS	-	expression tag	UNP Q14392
E	656	PRO	-	expression tag	UNP Q14392
E	657	GLN	-	expression tag	UNP Q14392
E	658	PHE	-	expression tag	UNP Q14392
E	659	GLU	-	expression tag	UNP Q14392
E	660	LYS	-	expression tag	UNP Q14392
E	661	GLY	-	expression tag	UNP Q14392
E	662	ALA	-	expression tag	UNP Q14392
E	663	ALA	-	expression tag	UNP Q14392
E	664	TRP	-	expression tag	UNP Q14392
E	665	SER	-	expression tag	UNP Q14392
E	666	HIS	-	expression tag	UNP Q14392
E	667	PRO	-	expression tag	UNP Q14392
E	668	GLN	-	expression tag	UNP Q14392
E	669	PHE	-	expression tag	UNP Q14392
E	670	GLU	-	expression tag	UNP Q14392
E	671	LYS	-	expression tag	UNP Q14392
E	672	GLY	-	expression tag	UNP Q14392
E	673	ALA	-	expression tag	UNP Q14392
E	674	ALA	-	expression tag	UNP Q14392

- Molecule 3 is a protein called hFab LHT-22, Light Chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	F	112	Total	C	N	O	S	0	0
			822	513	142	164	3		
3	I	114	Total	C	N	O	S	0	0
			835	520	145	167	3		

- Molecule 4 is a protein called hFab LHT-22, Heavy Chain.

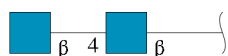
Mol	Chain	Residues	Atoms					AltConf	Trace
4	G	120	Total	C	N	O	S	0	0
			911	574	152	179	6		
4	H	124	Total	C	N	O	S	0	0
			946	595	158	187	6		

- Molecule 5 is an oligosaccharide called alpha-D-mannopyranose-(1-6)-beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



Mol	Chain	Residues	Atoms				AltConf	Trace
5	J	4	Total	C	N	O	0	0
			50	28	2	20		
5	K	4	Total	C	N	O	0	0
			50	28	2	20		

- Molecule 6 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



Mol	Chain	Residues	Atoms				AltConf	Trace
6	L	2	Total	C	N	O	0	0
			28	16	2	10		

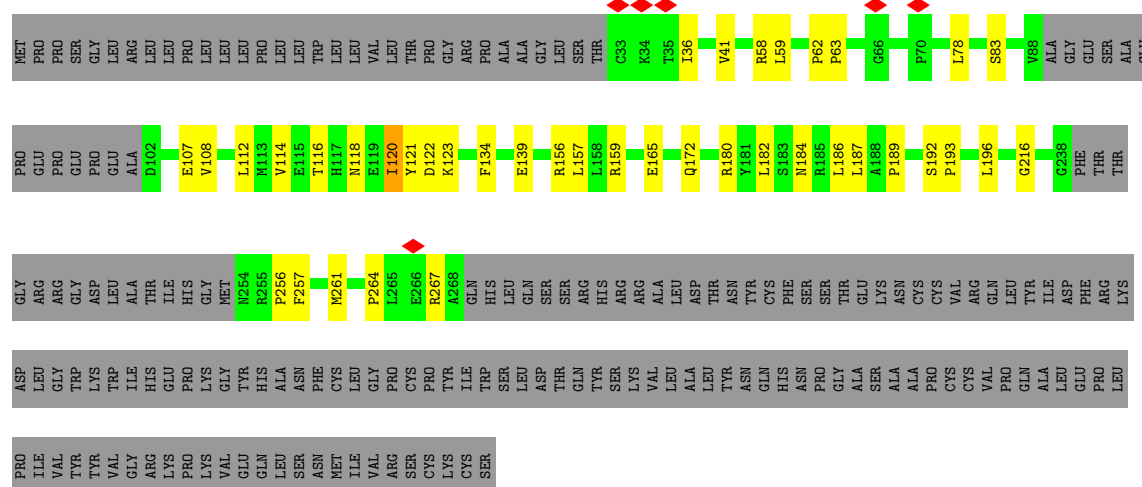
- Molecule 7 is 2-acetamido-2-deoxy-beta-D-glucopyranose (CCD ID: NAG) (formula: C₈H₁₅NO₆).



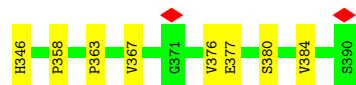
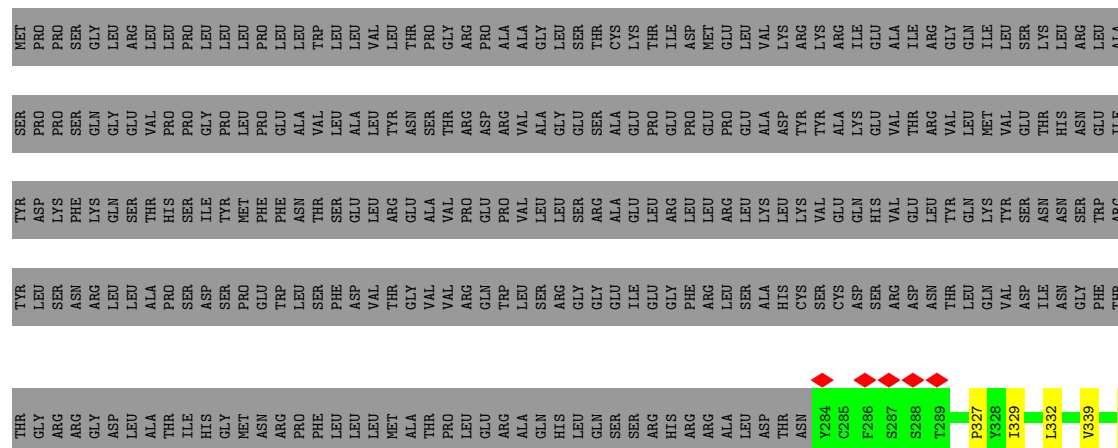
Mol	Chain	Residues	Atoms				AltConf
7	A	1	Total	C	N	O	0
			14	8	1	5	
7	C	1	Total	C	N	O	0
			14	8	1	5	
7	C	1	Total	C	N	O	0
			14	8	1	5	
7	E	1	Total	C	N	O	0
			14	8	1	5	
7	E	1	Total	C	N	O	0
			14	8	1	5	



• Molecule 1: Transforming growth factor beta-1

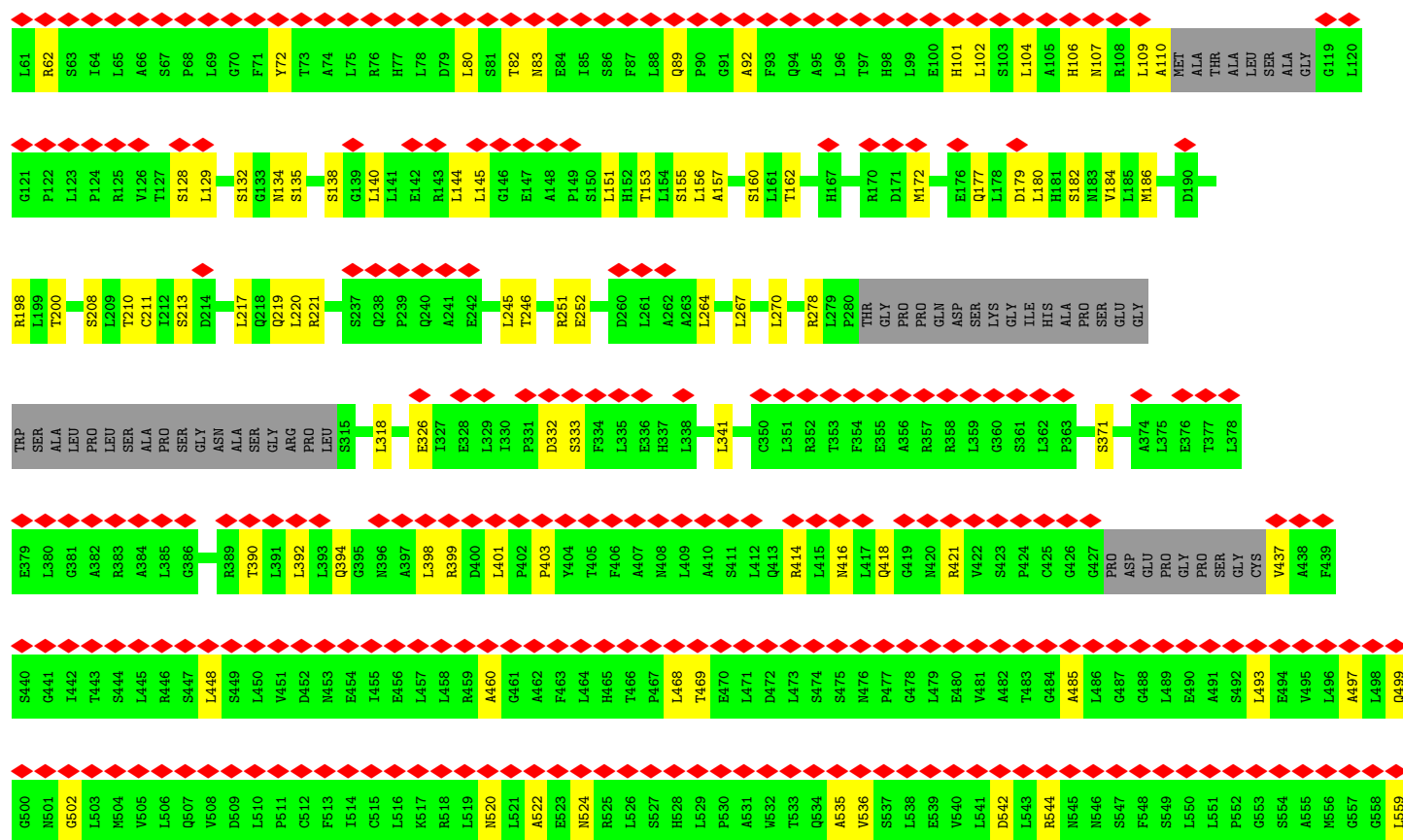


• Molecule 1: Transforming growth factor beta-1



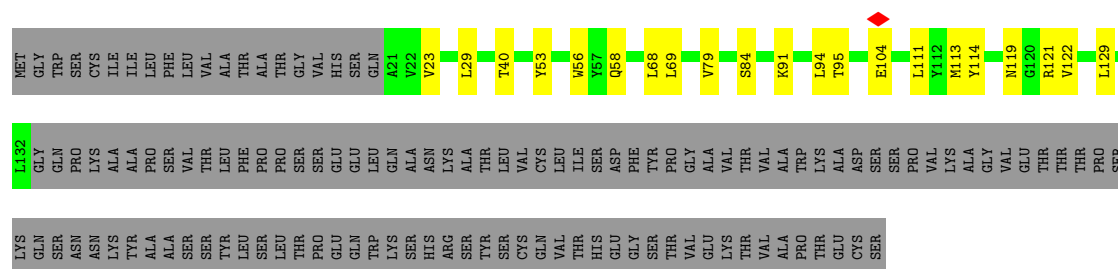
• Molecule 2: Transforming growth factor beta activator LRRC32





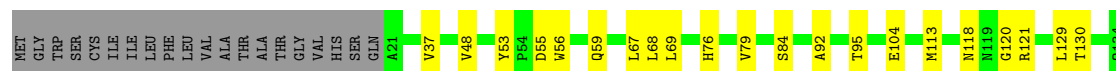
• Molecule 3: hFab LHT-22, Light Chain

Chain F: 38% 9% 53%



• Molecule 3: hFab LHT-22, Light Chain

Chain I: 39% 9% 52%



[illegible]

- Molecule 4: hFab LHT-22, Heavy Chain

Chain G: 36% 12% 51%

[illegible]

- Molecule 4: hFab LHT-22, Heavy Chain

Chain H:

SER	LEU	SER	SER	VAL	THR	VAL	PRO	SER	SER	SER	LEU	GLY	THR	GLN	THR	THR	TYR	ILE	CYS	ASN	VAL	VAL	ASN	HIS	PRO	SER	ASN	THR	THR	LYS	VAL	ASP	GLU	LYS	VAL	GLU	PRO	LYS	THR	GLY	PRO	ASN	SER	ASP	LYS	THR	HIS		
LYS	GLY	PRO	SER	VAL	PHE	PRO	LEU	ALA	SER	SER	LYS	THR	THR	SER	GLY	GLY	THR	ALA	LEU	GLY	LEU	CYS	LEU	VAL	VAL	ASP	PHE	PRO	GLU	PRO	VAL	THR	VAL	SER	TRP	ASN	SER	GLY	ALA	LEU	THR	SER	GLY	VAL	HIS	GLN	SER	GLY	TYR
MET	GLY	TRP	SER	CYS	ILE	ILE	LEU	PHE	LEU	VAL	ALA	THR	ALA	THR	GLY	HIS	SER	E20	L23	A43	F48	D50	D49	M53	Q58	R71	W72	Y79	R91	D92	Q95	L98	Q101	M102	N103	S104	L105	Y113	L123	T124	Y125	G133							

- Molecule 5: alpha-D-mannopyranose-(1-6)-beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain J: 25% 75%

NAG1	NAG2	BMA3	MAN4
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- Molecule 5: alpha-D-mannopyranose-(1-6)-beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain K: 25% 75%

NAG1	NAG2	BMA3	MAN4
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- Molecule 6: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain L:

100%

3AG1
3AG2

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	320551	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	JEOL CRYO ARM 300	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	61.8	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.472	Depositor
Minimum map value	-0.278	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.008	Depositor
Recommended contour level	0.06	Depositor
Map size (Å)	316.80002, 316.80002, 316.80002	wwPDB
Map dimensions	440, 440, 440	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.72, 0.72, 0.72	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: MAN, NAG, 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	0.33	0/1675	0.56	3/2277 (0.1%)
1	B	0.19	0/841	0.45	0/1149
1	C	0.22	0/1682	0.48	2/2282 (0.1%)
1	D	0.15	0/841	0.37	0/1153
2	E	0.18	0/3857	0.41	0/5257
3	F	0.25	0/840	0.47	0/1148
3	I	0.25	0/853	0.49	0/1165
4	G	0.18	0/931	0.44	0/1264
4	H	0.17	0/966	0.44	0/1309
All	All	0.22	0/12486	0.46	5/17004 (0.0%)

There are no bond length outliers.

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	72	PRO	N-CA-C	-7.49	99.45	111.14
1	C	120	ILE	CA-C-N	-6.68	110.28	122.38
1	C	120	ILE	C-N-CA	-6.68	110.28	122.38
1	A	69	PRO	N-CA-C	-6.27	103.05	110.70
1	A	183	SER	N-CA-C	5.18	116.95	109.07

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	1642	0	1609	29	0
1	B	815	0	763	16	0
1	C	1649	0	1627	29	0
1	D	815	0	751	13	0
2	E	3795	0	3749	56	0
3	F	822	0	796	12	0
3	I	835	0	807	14	0
4	G	911	0	859	24	0
4	H	946	0	904	18	0
5	J	50	0	43	2	0
5	K	50	0	43	1	0
6	L	28	0	25	0	0
7	A	14	0	13	0	0
7	C	28	0	26	0	0
7	E	28	0	26	0	0
All	All	12428	0	12041	193	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 8.

All (193) 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:342:LEU:O	1:D:346:HIS:HB2	1.65	0.97
1:A:56:LYS:NZ	1:D:380:SER:O	2.23	0.72
4:H:113:TYR:O	4:H:133:GLY:HA2	1.90	0.71
1:D:339:VAL:HG21	2:E:160:SER:HB3	1.72	0.71
3:I:104:GLU:HG3	3:I:130:THR:HA	1.74	0.70
1:A:108:VAL:HG22	1:A:261:MET:HG3	1.75	0.69
1:C:116:THR:HA	1:C:121:TYR:CD2	2.28	0.68
1:C:134:PHE:HD1	1:C:216:GLY:HA3	1.58	0.68
1:B:363:PRO:HB3	1:B:378:GLN:HE21	1.59	0.68
4:H:48:PHE:HB3	4:H:91:ARG:HH21	1.58	0.68
1:D:327:PRO:HB2	2:E:208:SER:HB3	1.76	0.67
4:H:79:TYR:H	3:I:118:ASN:HD21	1.40	0.67
1:C:157:LEU:HD23	1:C:256:PRO:HB3	1.77	0.67
3:F:53:TYR:O	3:F:121:ARG:NH1	2.27	0.67
1:B:303:ARG:HD2	1:B:309:LYS:HE3	1.76	0.67
1:C:108:VAL:HG22	1:C:261:MET:HG2	1.78	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:145:LEU:HD13	2:E:172:MET:HE1	1.79	0.64
2:E:499:GLN:HG3	2:E:522:ALA:HB3	1.79	0.63
3:F:104:GLU:HA	3:F:129:LEU:O	1.98	0.63
1:A:120:ILE:HG12	1:A:214:ILE:HG21	1.79	0.63
1:C:116:THR:HA	1:C:121:TYR:CE2	2.34	0.63
3:F:40:THR:HG22	3:F:91:LYS:HE2	1.81	0.63
4:G:113:TYR:O	4:G:133:GLY:HA2	1.99	0.62
1:B:294:CYS:SG	1:B:296:ARG:NH1	2.73	0.62
1:C:187:LEU:HD21	1:C:196:LEU:HD11	1.81	0.62
1:A:174:TYR:OH	1:A:180:ARG:NH1	2.33	0.62
1:C:157:LEU:HB2	1:C:196:LEU:HB2	1.81	0.61
2:E:101:HIS:HA	2:E:128:SER:HB3	1.81	0.61
4:G:21:LEU:HA	4:G:44:SER:O	2.01	0.61
1:A:159:ARG:O	1:A:193:PRO:HA	2.01	0.60
1:C:83:SER:O	1:C:156:ARG:NH2	2.30	0.60
4:H:124:THR:HG22	4:H:125:TYR:H	1.66	0.60
3:F:58:GLN:HB2	3:F:68:LEU:HD11	1.83	0.60
4:G:34:GLY:N	4:G:105:LEU:O	2.35	0.59
2:E:544:ARG:HH12	2:E:567:TYR:HB3	1.67	0.59
1:B:282:THR:HG22	1:B:295:VAL:HG11	1.84	0.58
1:A:113:MET:SD	1:A:121:TYR:OH	2.59	0.58
4:G:58:GLN:HB2	4:G:64:LEU:HD23	1.84	0.58
1:C:114:VAL:HG11	1:C:120:ILE:HD11	1.86	0.58
1:A:102:ASP:OD1	1:A:103:TYR:N	2.37	0.58
1:C:107:GLU:HB2	1:C:264:PRO:HG3	1.86	0.57
3:F:56:TRP:HB2	3:F:69:LEU:HB2	1.86	0.57
4:G:41:CYS:HB3	4:G:98:LEU:HB3	1.86	0.57
1:C:123:LYS:HE3	4:H:50:ASP:HA	1.86	0.57
1:D:367:VAL:HG22	1:D:376:VAL:HG22	1.86	0.56
1:A:150:LEU:O	1:A:205:ARG:NH1	2.39	0.56
2:E:390:THR:HG23	2:E:414:ARG:HD2	1.87	0.56
4:H:23:LEU:HD23	4:H:43:ALA:HB2	1.88	0.55
1:B:367:VAL:HG22	1:B:376:VAL:HG22	1.87	0.55
2:E:460:ALA:HA	2:E:485:ALA:HA	1.87	0.55
1:B:354:PRO:HA	1:B:390:SER:O	2.07	0.54
1:C:165:GLU:HB3	1:C:189:PRO:HD3	1.88	0.54
3:I:56:TRP:HB2	3:I:69:LEU:HB2	1.89	0.54
3:I:84:SER:OG	3:I:95:THR:OG1	2.25	0.54
1:A:115:GLU:HG3	1:A:255:ARG:HH12	1.73	0.53
1:C:172:GLN:HB3	1:C:182:LEU:HD11	1.89	0.53
4:H:71:ARG:HH21	4:H:72:TRP:HZ3	1.55	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:49:PRO:HA	2:E:72:TYR:HD1	1.74	0.53
1:B:362:GLU:OE1	1:B:385:ARG:NH2	2.41	0.53
4:G:71:ARG:O	4:G:91:ARG:NH1	2.42	0.53
1:D:342:LEU:HD13	2:E:186:MET:HE1	1.90	0.52
2:E:107:ASN:N	2:E:134:ASN:OD1	2.40	0.52
3:I:67:LEU:HD22	3:I:76:HIS:HB2	1.91	0.52
1:C:112:LEU:HD23	1:C:257:PHE:HB3	1.91	0.52
2:E:403:PRO:HA	2:E:437:VAL:HA	1.91	0.52
2:E:536:VAL:H	2:E:559:LEU:HB3	1.74	0.52
2:E:278:ARG:HG2	2:E:326:GLU:HB3	1.92	0.52
1:D:332:LEU:HD21	2:E:182:SER:HB3	1.90	0.52
1:A:172:GLN:OE1	1:A:180:ARG:NH2	2.42	0.51
2:E:497:ALA:HA	2:E:520:ASN:HB3	1.92	0.51
4:G:34:GLY:CA	4:G:105:LEU:O	2.58	0.51
2:E:469:THR:HA	2:E:493:LEU:HA	1.93	0.51
1:A:169:GLU:HG2	1:A:184:ASN:HD21	1.76	0.51
1:A:267:ARG:NH1	1:D:377:GLU:OE2	2.43	0.51
1:B:361:LEU:HB3	1:B:381:ASN:HA	1.92	0.51
4:G:103:ASN:HD22	4:G:103:ASN:C	2.18	0.51
1:B:358:PRO:HB3	1:B:384:VAL:HG13	1.93	0.50
1:A:146:GLU:HB3	1:A:149:LEU:HG	1.92	0.50
1:B:293:CYS:HA	1:B:323:LEU:O	2.11	0.50
2:E:246:THR:HA	2:E:267:LEU:HA	1.94	0.50
3:I:55:ASP:OD2	3:I:121:ARG:NH2	2.45	0.49
1:C:159:ARG:O	1:C:193:PRO:HA	2.12	0.49
4:G:48:PHE:O	4:G:91:ARG:NH2	2.46	0.49
2:E:49:PRO:HA	2:E:72:TYR:CD1	2.48	0.49
3:F:69:LEU:HD12	3:F:94:LEU:HD12	1.94	0.48
2:E:245:LEU:HB3	2:E:264:LEU:HD22	1.95	0.48
3:F:113:MET:HE2	3:F:122:VAL:HG11	1.95	0.48
1:A:42:LYS:O	1:A:46:ILE:HG12	2.14	0.48
4:H:113:TYR:O	4:H:133:GLY:CA	2.61	0.48
2:E:198:ARG:HA	2:E:219:GLN:HG2	1.96	0.48
2:E:371:SER:HB2	2:E:394:GLN:HG2	1.96	0.48
2:E:60:GLN:O	2:E:62:ARG:NH1	2.43	0.48
2:E:392:LEU:HA	2:E:416:ASN:HB3	1.95	0.48
3:I:68:LEU:HA	3:I:79:VAL:HG21	1.95	0.48
2:E:80:LEU:O	2:E:83:ASN:ND2	2.47	0.47
1:D:339:VAL:HG13	1:D:342:LEU:HD12	1.96	0.47
2:E:332:ASP:OD1	2:E:333:SER:N	2.47	0.47
4:H:58:GLN:OE1	3:I:59:GLN:NE2	2.39	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:172:GLN:HB2	1:A:182:LEU:HD11	1.95	0.47
1:D:363:PRO:HB3	1:D:380:SER:HA	1.96	0.47
2:E:153:THR:HA	2:E:177:GLN:HB2	1.96	0.47
4:G:117:LYS:NZ	4:G:128:ASP:OD2	2.44	0.47
1:A:169:GLU:HG2	1:A:184:ASN:ND2	2.29	0.47
1:B:296:ARG:HD3	1:B:323:LEU:HB3	1.96	0.47
1:B:363:PRO:HB3	1:B:378:GLN:NE2	2.30	0.47
4:H:101:GLN:OE1	4:H:103:ASN:ND2	2.45	0.47
1:C:58:ARG:HB2	1:C:267:ARG:HD2	1.95	0.46
1:A:184:ASN:OD1	1:C:184:ASN:ND2	2.48	0.46
4:G:22:GLN:HA	4:G:129:TYR:HE2	1.80	0.46
3:F:84:SER:OG	3:F:95:THR:OG1	2.33	0.46
4:H:53:MET:HB3	4:H:98:LEU:HD22	1.96	0.46
1:A:181:TYR:CD2	1:C:186:LEU:HD11	2.51	0.46
2:E:251:ARG:HG3	2:E:252:GLU:HG3	1.97	0.46
2:E:568:LEU:HD22	2:E:581:LEU:HD21	1.97	0.46
3:I:48:VAL:HG11	3:I:92:ALA:HB2	1.97	0.46
1:C:172:GLN:NE2	1:C:180:ARG:HH21	2.13	0.46
2:E:138:SER:HB2	2:E:162:THR:H	1.81	0.46
4:G:48:PHE:HB3	4:G:91:ARG:HH21	1.81	0.46
4:G:59:ALA:HB3	4:G:62:LYS:HB2	1.99	0.45
4:H:123:LEU:HD21	3:I:120:GLY:HA2	1.97	0.45
3:I:53:TYR:O	3:I:121:ARG:NH2	2.49	0.45
2:E:89:GLN:HB3	2:E:92:ALA:HB2	1.97	0.45
4:G:102:MET:HB3	4:G:105:LEU:HD13	1.99	0.45
2:E:200:THR:HA	2:E:220:LEU:HA	1.98	0.45
4:G:117:LYS:O	4:G:128:ASP:N	2.50	0.45
2:E:217:LEU:HD23	2:E:217:LEU:HA	1.87	0.45
1:A:134:PHE:HA	1:A:216:GLY:HA3	1.98	0.45
4:H:101:GLN:NE2	4:H:103:ASN:OD1	2.45	0.45
1:A:111:VAL:HG11	1:A:140:LEU:HD12	1.99	0.44
2:E:210:THR:OG1	2:E:211:CYS:N	2.49	0.44
4:G:49:ASP:OD1	4:G:93:ASN:ND2	2.39	0.44
2:E:502:GLY:HA2	2:E:524:ASN:HA	1.99	0.44
2:E:267:LEU:HD21	2:E:270:LEU:HB2	1.99	0.44
1:A:153:ALA:HB3	1:A:201:THR:HA	1.98	0.44
1:C:159:ARG:NH2	1:C:192:SER:O	2.48	0.44
1:A:134:PHE:HD1	1:A:216:GLY:HA3	1.82	0.44
1:A:123:LYS:NZ	4:G:49:ASP:O	2.51	0.43
2:E:394:GLN:HB3	2:E:418:GLN:HB2	2.00	0.43
2:E:104:LEU:O	2:E:134:ASN:ND2	2.51	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:H:92:ASP:HB3	4:H:95:GLN:HB2	2.00	0.43
2:E:520:ASN:HA	2:E:542:ASP:HB2	2.01	0.43
2:E:318:LEU:HA	2:E:341:LEU:HA	2.00	0.43
4:G:23:LEU:HG	4:G:43:ALA:HB2	2.00	0.43
4:G:55:TRP:NE1	4:G:100:LEU:HB2	2.34	0.43
3:F:29:LEU:HD11	3:F:129:LEU:HD12	2.00	0.43
1:C:122:ASP:HB2	4:H:72:TRP:HZ2	1.83	0.43
4:G:117:LYS:HD2	4:G:128:ASP:HB3	1.99	0.43
1:A:33:CYS:HB3	2:E:213:SER:HB2	2.00	0.43
1:B:323:LEU:HD11	1:C:36:ILE:HG12	2.01	0.43
5:J:1:NAG:H61	5:J:2:NAG:HN2	1.81	0.43
1:A:185:ARG:HG2	1:A:196:LEU:HD11	2.01	0.42
1:A:73:LEU:HD23	1:D:367:VAL:HG11	2.01	0.42
1:A:207:TRP:HA	1:A:211:GLY:HA3	2.00	0.42
4:G:83:MET:HE2	4:G:83:MET:HB3	1.95	0.42
2:E:151:LEU:HD21	2:E:172:MET:HB2	2.01	0.42
3:F:114:TYR:HA	3:F:119:ASN:HA	2.01	0.42
1:A:115:GLU:HG3	1:A:255:ARG:NH1	2.33	0.42
2:E:156:LEU:HB2	2:E:180:LEU:HD23	2.00	0.42
4:H:102:MET:HB3	4:H:105:LEU:HD21	2.02	0.42
2:E:155:SER:HA	2:E:179:ASP:HB3	2.01	0.42
2:E:82:THR:H	2:E:106:HIS:HB2	1.84	0.42
5:J:1:NAG:H61	5:J:2:NAG:N2	2.35	0.42
1:B:323:LEU:HD13	1:C:41:VAL:HG11	2.02	0.42
1:C:62:PRO:HA	1:C:63:PRO:HD3	1.94	0.42
4:G:53:MET:HB3	4:G:98:LEU:HD11	2.02	0.42
4:H:71:ARG:O	4:H:91:ARG:NH1	2.53	0.42
2:E:102:LEU:HB3	2:E:129:LEU:HD23	2.02	0.41
4:G:34:GLY:HA2	4:G:105:LEU:O	2.19	0.41
1:C:139:GLU:OE2	5:K:1:NAG:O6	2.34	0.41
4:G:110:THR:HA	4:G:136:VAL:O	2.20	0.41
3:I:37:VAL:HG11	3:I:129:LEU:HD11	2.02	0.41
1:D:358:PRO:HB3	1:D:384:VAL:HG13	2.02	0.41
2:E:140:LEU:HD23	2:E:144:LEU:HB2	2.01	0.41
2:E:399:ARG:HD2	2:E:421:ARG:HH22	1.86	0.41
2:E:535:ALA:HA	2:E:559:LEU:H	1.86	0.41
1:B:295:VAL:HG13	1:B:320:ASN:HB3	2.02	0.41
1:C:78:LEU:HD23	1:C:78:LEU:HA	1.92	0.41
1:C:159:ARG:HD3	1:C:187:LEU:HD23	2.03	0.41
4:H:79:TYR:H	3:I:118:ASN:ND2	2.13	0.41
1:A:133:MET:HE3	1:A:133:MET:HB2	1.91	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:303:ARG:HD2	1:B:309:LYS:CE	2.49	0.41
1:C:118:ASN:HD22	1:C:118:ASN:HA	1.77	0.41
2:E:110:ALA:HB2	2:E:135:SER:HB3	2.02	0.41
2:E:398:LEU:HD13	2:E:401:LEU:HD11	2.02	0.41
1:C:59:LEU:HD23	1:C:59:LEU:HA	1.92	0.41
3:F:68:LEU:HA	3:F:79:VAL:HG21	2.03	0.41
3:I:113:MET:HE2	3:I:113:MET:HB3	1.81	0.40
2:E:132:SER:HA	2:E:157:ALA:O	2.20	0.40
1:D:329:ILE:HG23	2:E:184:VAL:HG13	2.03	0.40
2:E:448:LEU:HB3	2:E:468:LEU:HD21	2.03	0.40
2:E:109:LEU:HD13	2:E:134:ASN:HD22	1.86	0.40
2:E:200:THR:O	2:E:221:ARG:N	2.42	0.40
3:F:23:VAL:HG22	3:F:111:LEU:HD12	2.02	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	204/390 (52%)	197 (97%)	7 (3%)	0	100	100
1	B	100/390 (26%)	92 (92%)	8 (8%)	0	100	100
1	C	202/390 (52%)	198 (98%)	4 (2%)	0	100	100
1	D	105/390 (27%)	101 (96%)	4 (4%)	0	100	100
2	E	502/674 (74%)	482 (96%)	20 (4%)	0	100	100
3	F	110/238 (46%)	106 (96%)	4 (4%)	0	100	100
3	I	112/238 (47%)	105 (94%)	7 (6%)	0	100	100
4	G	118/247 (48%)	114 (97%)	4 (3%)	0	100	100
4	H	122/247 (49%)	121 (99%)	1 (1%)	0	100	100
All	All	1575/3204 (49%)	1516 (96%)	59 (4%)	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	176/346 (51%)	175 (99%)	1 (1%)	84	92
1	B	89/346 (26%)	89 (100%)	0	100	100
1	C	180/346 (52%)	180 (100%)	0	100	100
1	D	87/346 (25%)	87 (100%)	0	100	100
2	E	402/569 (71%)	402 (100%)	0	100	100
3	F	89/196 (45%)	89 (100%)	0	100	100
3	I	90/196 (46%)	90 (100%)	0	100	100
4	G	94/205 (46%)	93 (99%)	1 (1%)	70	86
4	H	99/205 (48%)	99 (100%)	0	100	100
All	All	1306/2755 (47%)	1304 (100%)	2 (0%)	91	97

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

Mol	Chain	Res	Type
1	A	177	ASN
4	G	103	ASN

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	233	GLN
1	B	378	GLN
1	C	117	HIS
1	C	118	ASN
1	C	172	GLN
2	E	98	HIS
2	E	101	HIS
2	E	257	HIS

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Mol	Chain	Res	Type
2	E	507	GLN
2	E	586	HIS
2	E	587	GLN
4	G	54	ASN
4	H	93	ASN
3	I	118	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 ⓘ

10 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	$\# Z > 2$
5	NAG	J	1	1,5	14,14,15	0.27	0	17,19,21	0.53	0
5	NAG	J	2	5	14,14,15	0.31	0	17,19,21	0.52	0
5	BMA	J	3	5	11,11,12	0.68	0	15,15,17	0.90	0
5	MAN	J	4	5	11,11,12	0.70	0	15,15,17	1.13	2 (13%)
5	NAG	K	1	1,5	14,14,15	0.23	0	17,19,21	0.55	0
5	NAG	K	2	5	14,14,15	0.21	0	17,19,21	0.46	0
5	BMA	K	3	5	11,11,12	1.16	1 (9%)	15,15,17	1.11	1 (6%)
5	MAN	K	4	5	11,11,12	0.72	0	15,15,17	1.07	2 (13%)
6	NAG	L	1	2,6	14,14,15	0.24	0	17,19,21	0.45	0
6	NAG	L	2	6	14,14,15	0.26	0	17,19,21	0.39	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
5	NAG	J	1	1,5	-	2/6/23/26	0/1/1/1
5	NAG	J	2	5	-	2/6/23/26	0/1/1/1
5	BMA	J	3	5	-	0/2/19/22	0/1/1/1
5	MAN	J	4	5	-	0/2/19/22	0/1/1/1
5	NAG	K	1	1,5	-	2/6/23/26	0/1/1/1
5	NAG	K	2	5	-	4/6/23/26	0/1/1/1
5	BMA	K	3	5	-	0/2/19/22	0/1/1/1
5	MAN	K	4	5	-	0/2/19/22	0/1/1/1
6	NAG	L	1	2,6	-	2/6/23/26	0/1/1/1
6	NAG	L	2	6	-	2/6/23/26	0/1/1/1

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	K	3	BMA	C2-C3	2.32	1.55	1.52

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	J	4	MAN	C1-O5-C5	3.15	116.46	112.19
5	K	3	BMA	C2-C3-C4	2.59	115.37	110.89
5	K	4	MAN	C1-O5-C5	2.27	115.27	112.19
5	K	4	MAN	O2-C2-C3	-2.26	105.61	110.14
5	J	4	MAN	O2-C2-C3	-2.17	105.79	110.14

There are no chirality outliers.

All (14) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	J	1	NAG	O5-C5-C6-O6
6	L	2	NAG	O5-C5-C6-O6
5	J	2	NAG	O5-C5-C6-O6
5	J	2	NAG	C4-C5-C6-O6
5	K	1	NAG	O5-C5-C6-O6
5	J	1	NAG	C4-C5-C6-O6
5	K	1	NAG	C4-C5-C6-O6
5	K	2	NAG	O5-C5-C6-O6

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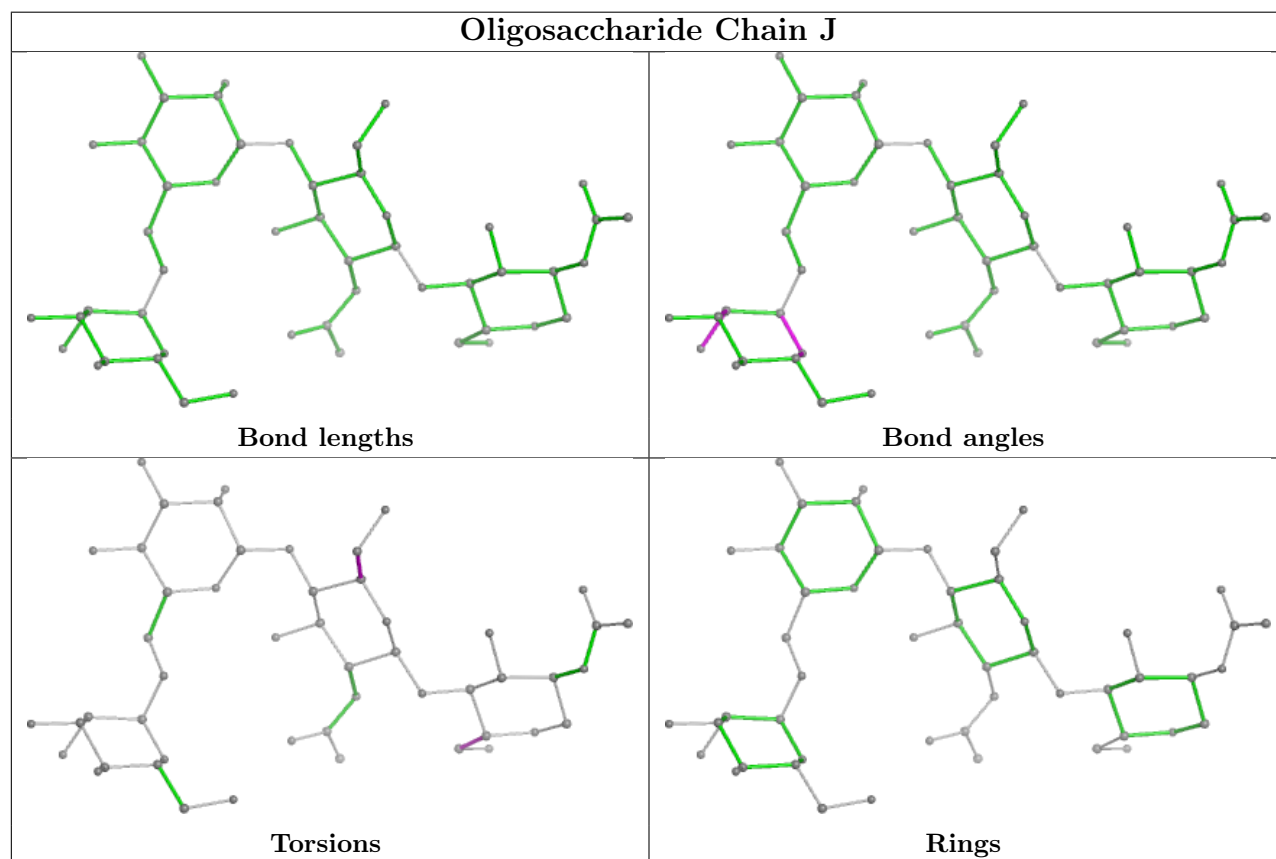
Mol	Chain	Res	Type	Atoms
6	L	1	NAG	O5-C5-C6-O6
5	K	2	NAG	C8-C7-N2-C2
5	K	2	NAG	O7-C7-N2-C2
6	L	2	NAG	C4-C5-C6-O6
5	K	2	NAG	C4-C5-C6-O6
6	L	1	NAG	C4-C5-C6-O6

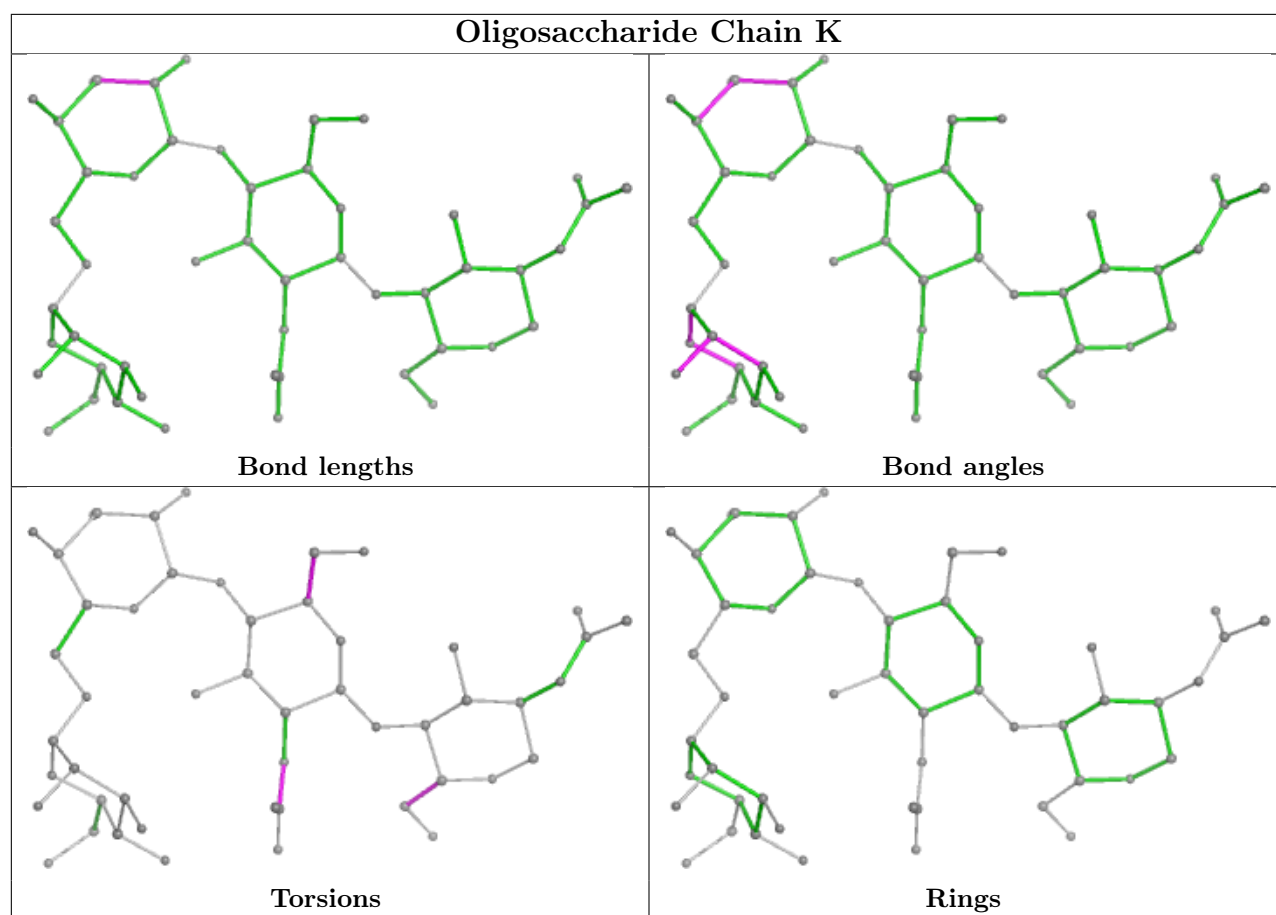
There are no ring outliers.

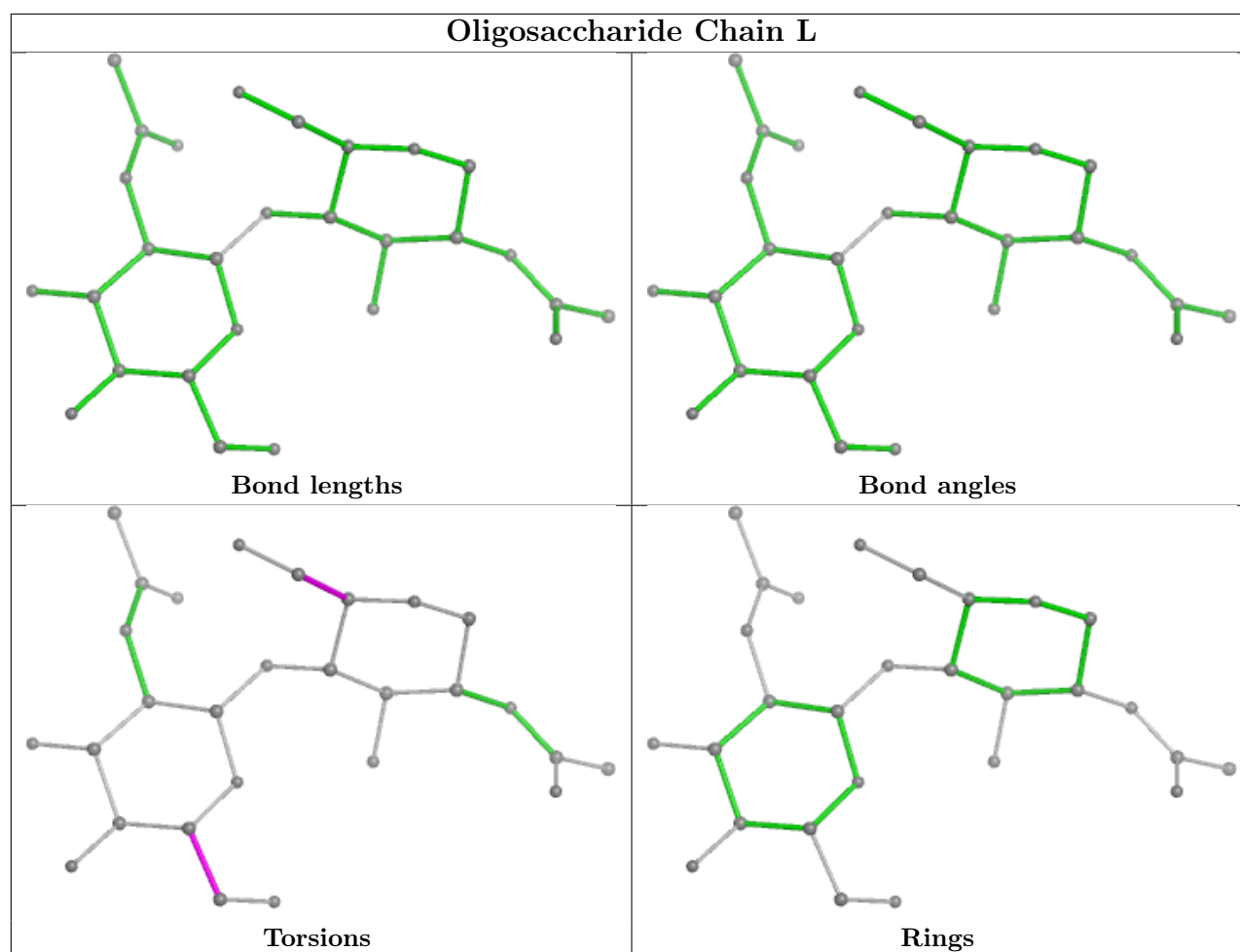
3 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	J	1	NAG	2	0
5	K	1	NAG	1	0
5	J	2	NAG	2	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](#)

5 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	$\# Z > 2$
7	NAG	A	1000	1	14,14,15	0.22	0	17,19,21	0.38	0
7	NAG	E	701	2	14,14,15	0.25	0	17,19,21	0.46	0
7	NAG	C	401	1	14,14,15	0.23	0	17,19,21	0.46	0
7	NAG	E	702	2	14,14,15	0.24	0	17,19,21	0.40	0
7	NAG	C	402	1	14,14,15	0.24	0	17,19,21	0.46	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
7	NAG	A	1000	1	-	2/6/23/26	0/1/1/1
7	NAG	E	701	2	-	0/6/23/26	0/1/1/1
7	NAG	C	401	1	-	1/6/23/26	0/1/1/1
7	NAG	E	702	2	-	1/6/23/26	0/1/1/1
7	NAG	C	402	1	-	0/6/23/26	0/1/1/1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (4) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
7	E	702	NAG	O5-C5-C6-O6
7	A	1000	NAG	O5-C5-C6-O6
7	C	401	NAG	O5-C5-C6-O6
7	A	1000	NAG	C4-C5-C6-O6

There are no ring outliers.

No monomer is involved in short contacts.

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.

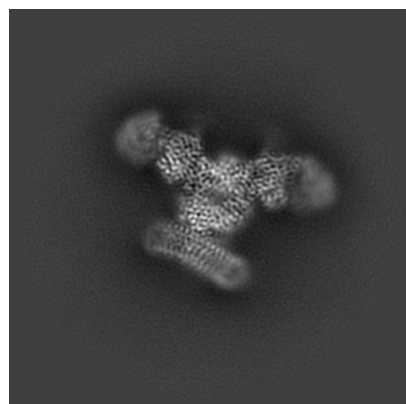
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-19110. These allow visual inspection of the internal detail of the map and identification of artifacts.

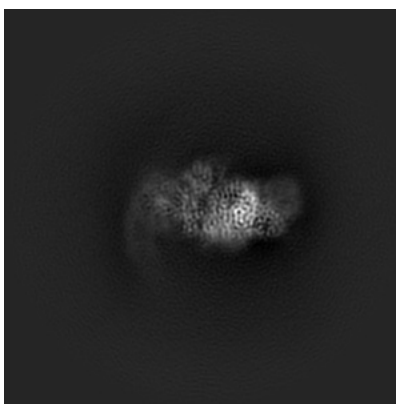
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

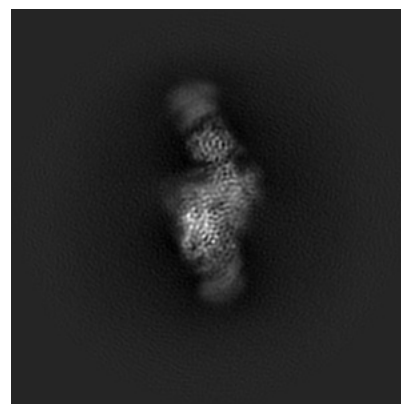
6.1.1 Primary map



X

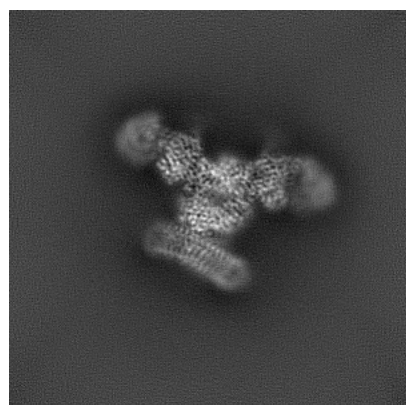


Y

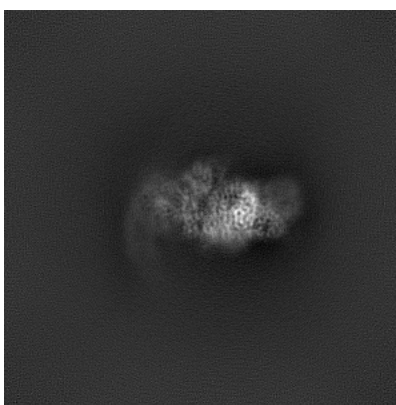


Z

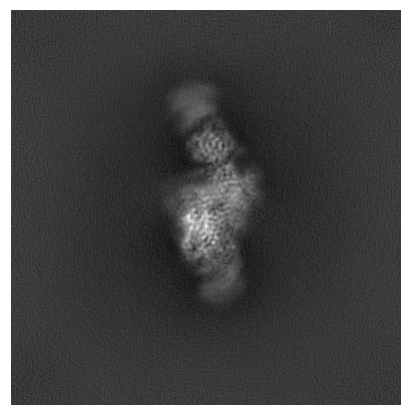
6.1.2 Raw map



X



Y

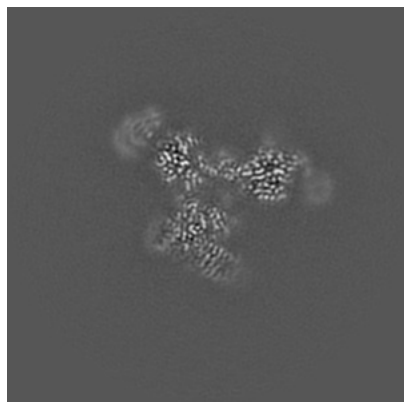


Z

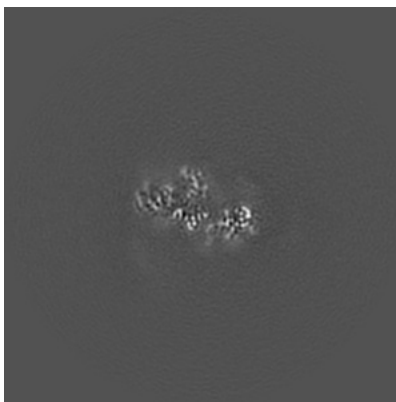
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

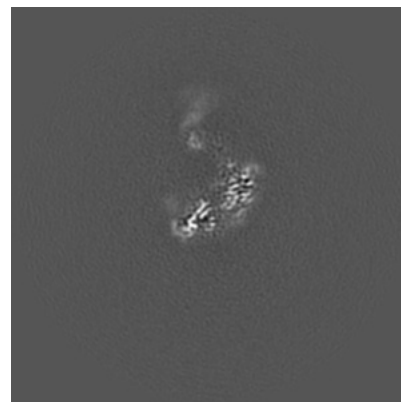
6.2.1 Primary map



X Index: 220

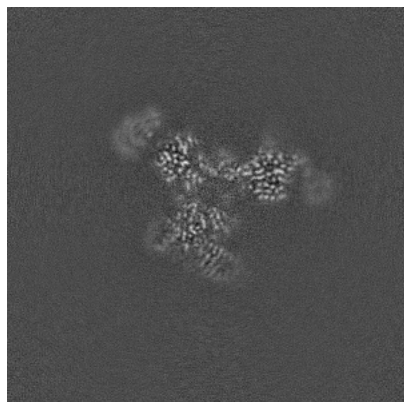


Y Index: 220

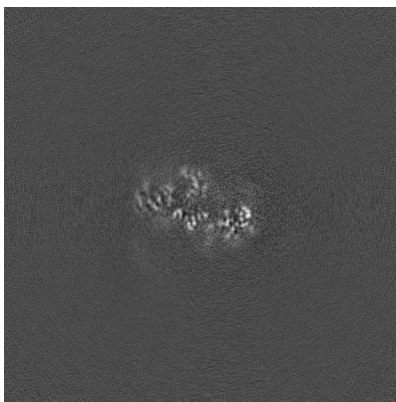


Z Index: 220

6.2.2 Raw map



X Index: 220



Y Index: 220

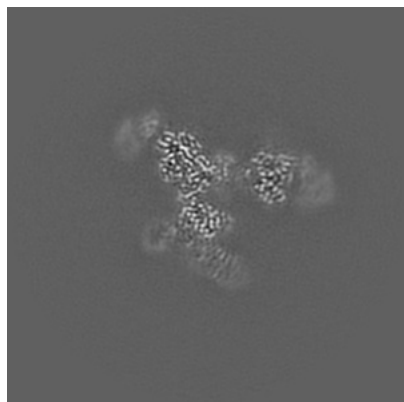


Z Index: 220

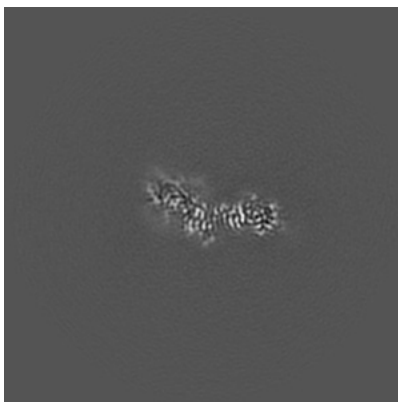
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

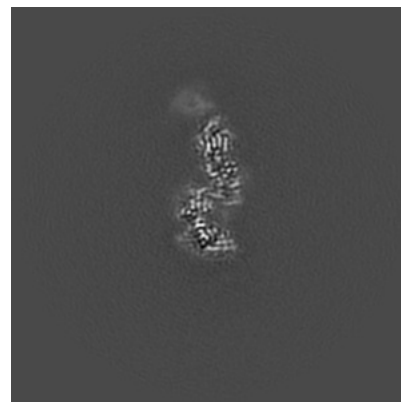
6.3.1 Primary map



X Index: 213

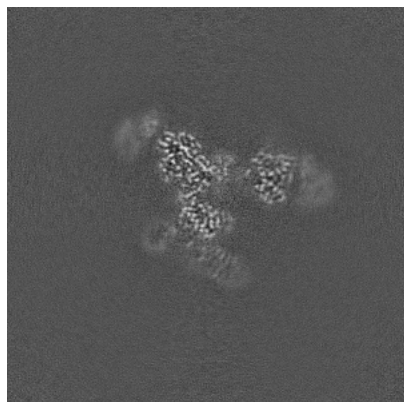


Y Index: 200

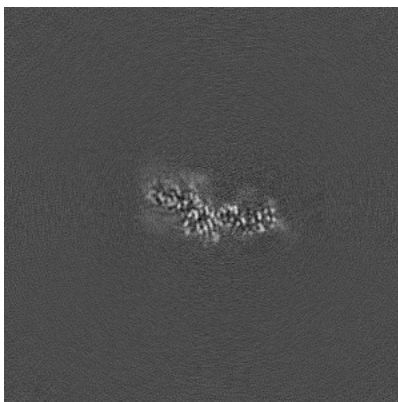


Z Index: 262

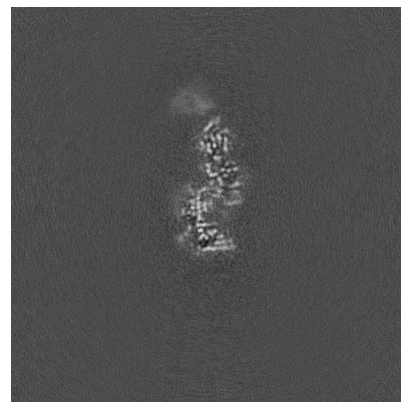
6.3.2 Raw map



X Index: 213



Y Index: 205

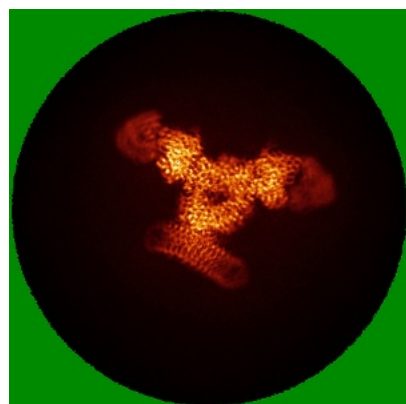


Z Index: 261

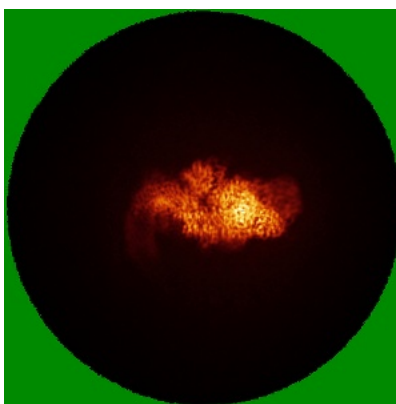
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color) [i](#)

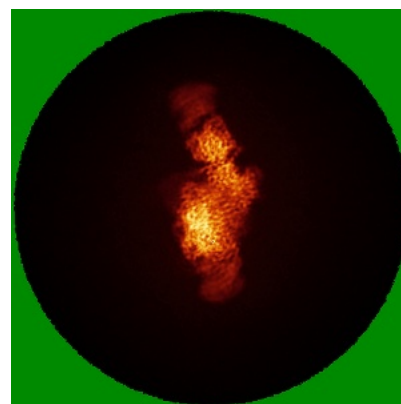
6.4.1 Primary map



X

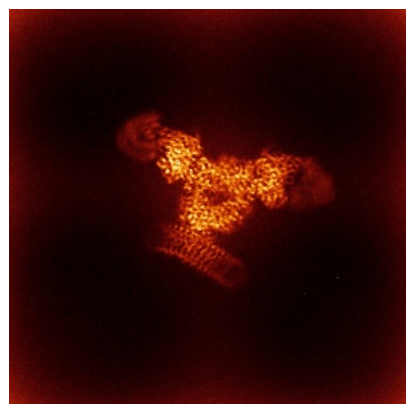


Y

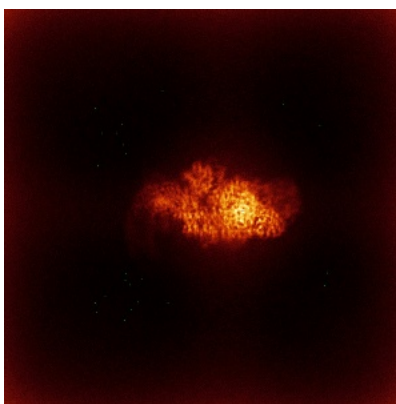


Z

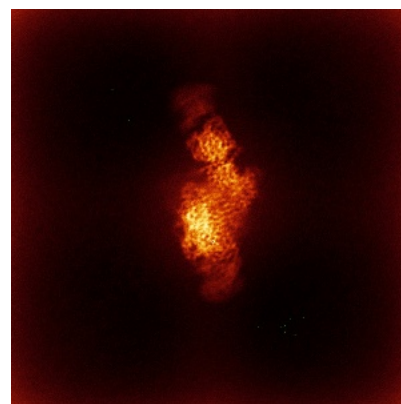
6.4.2 Raw map



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.

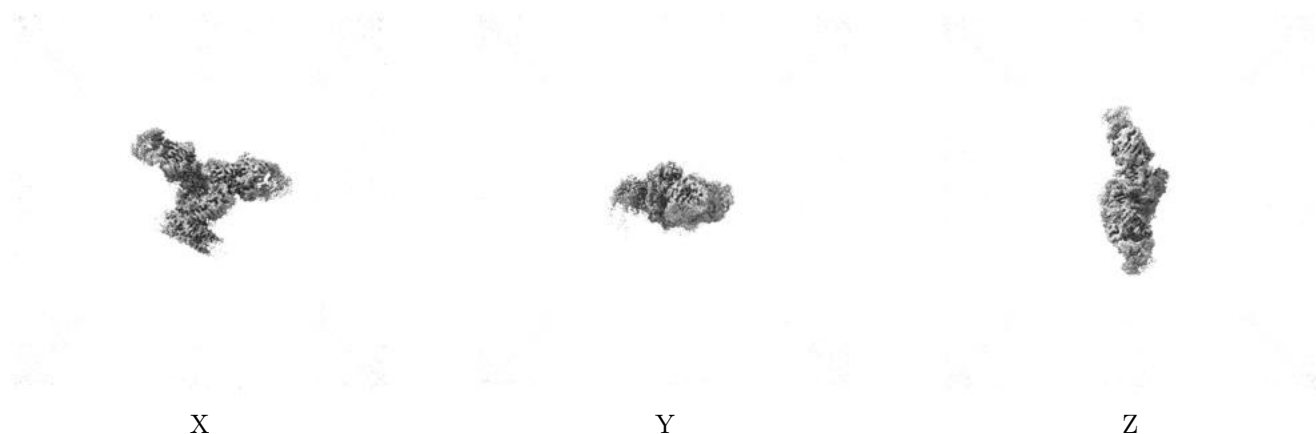
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.06. 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



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.

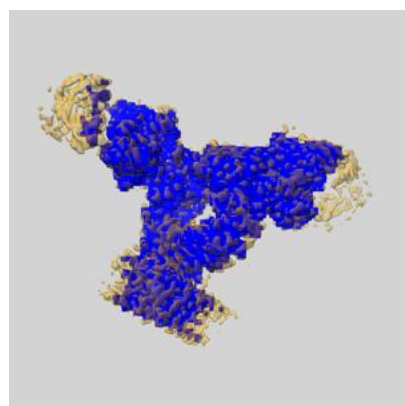
6.6 Mask visualisation [i](#)

This section shows the 3D surface view of the primary map at 50% transparency overlaid with the specified mask at 0% transparency

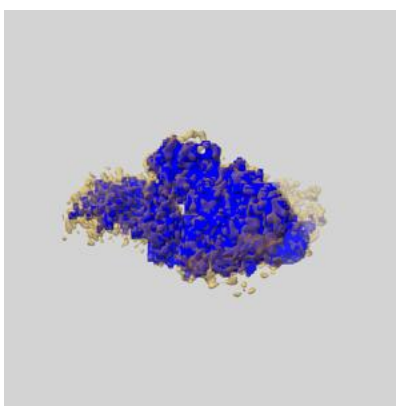
A mask typically either:

- Encompasses the whole structure
- Separates out a domain, a functional unit, a monomer or an area of interest from a larger structure

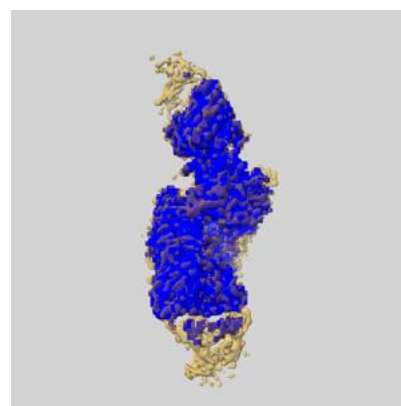
6.6.1 emd_19110_msk_1.map [i](#)



X



Y

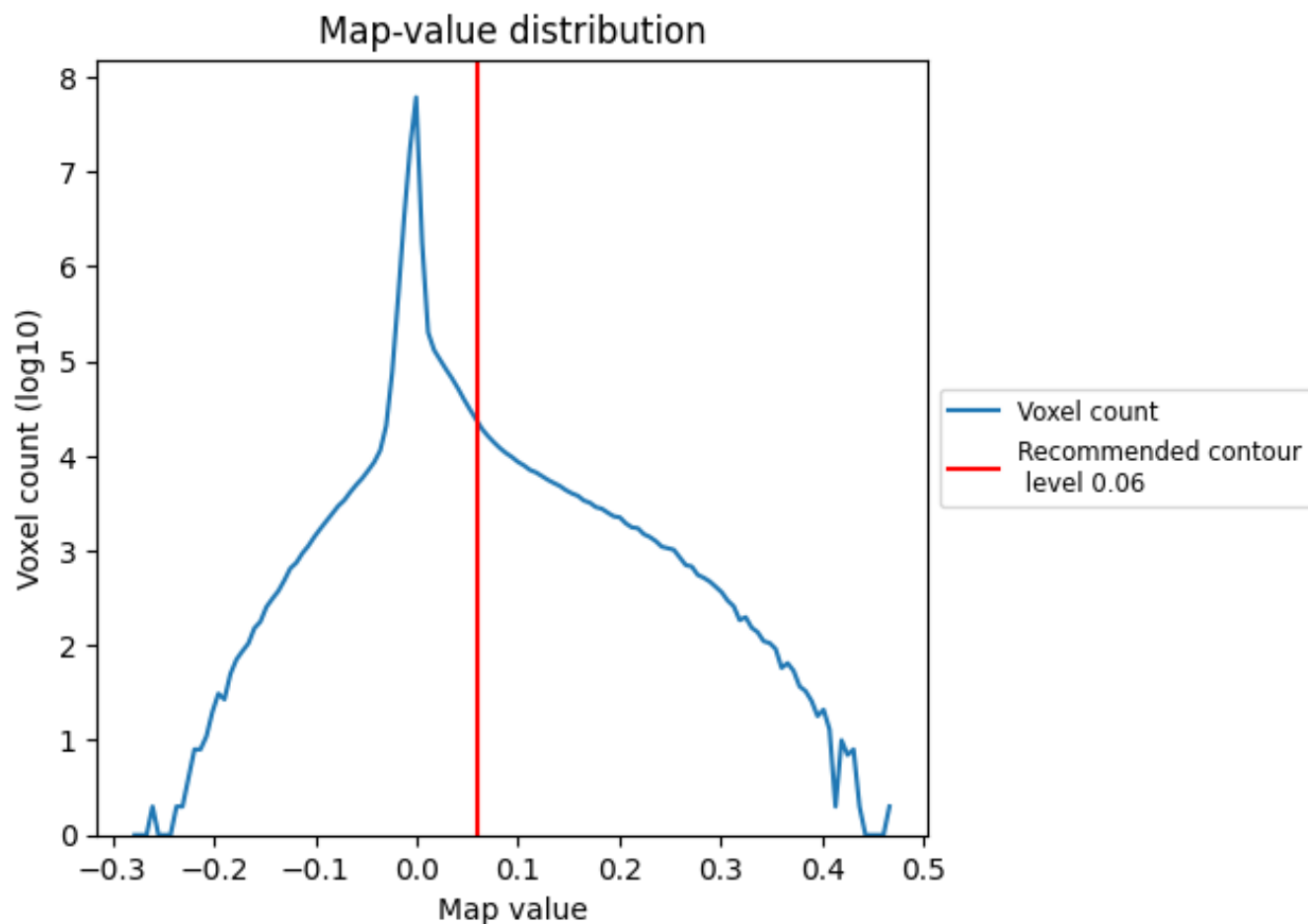


Z

7 Map analysis [i](#)

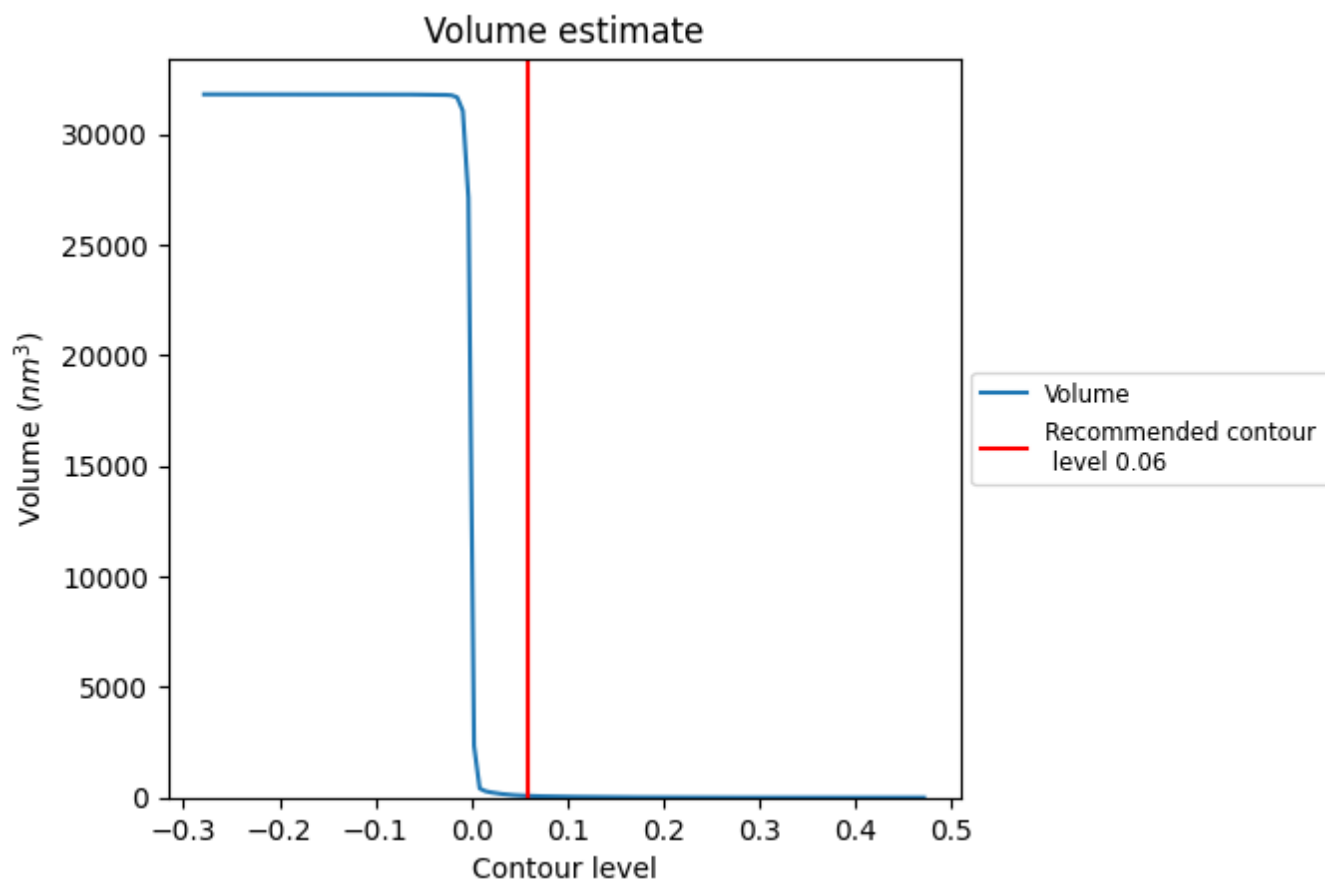
This section contains the results of statistical analysis of the map.

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.

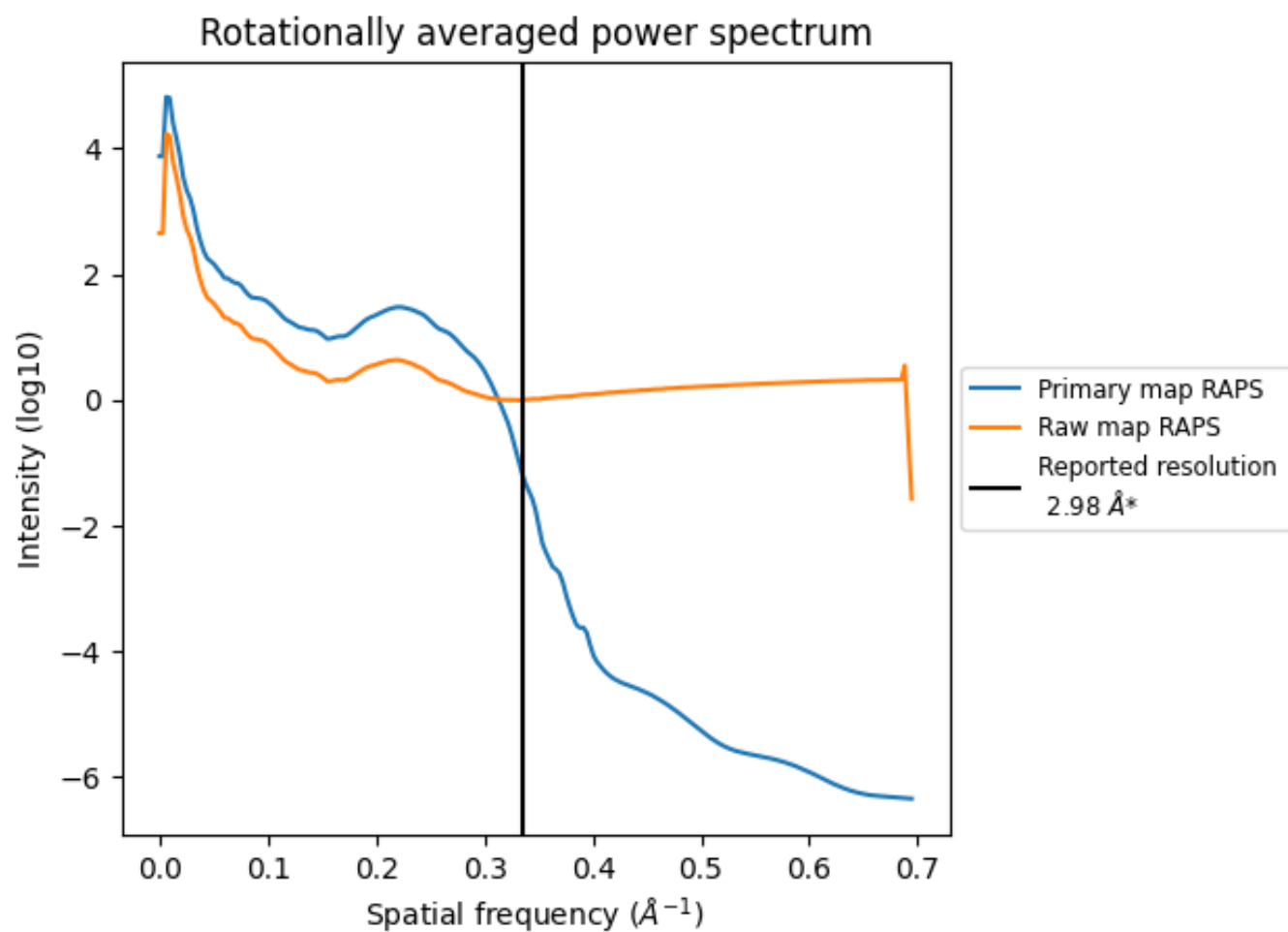
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 76 nm^3 ; this corresponds to an approximate mass of 68 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 ⓘ

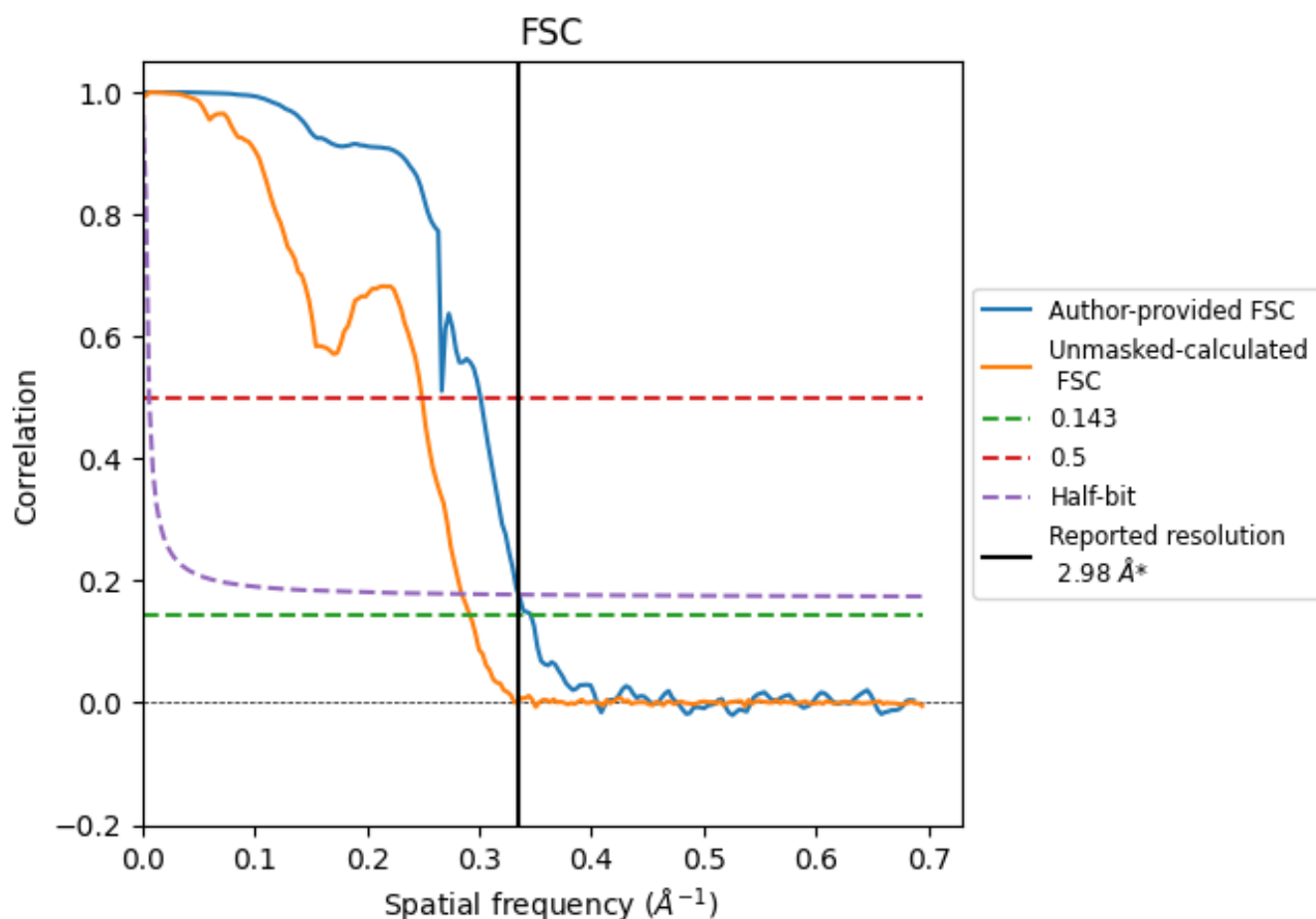


*Reported resolution corresponds to spatial frequency of 0.336 Å⁻¹

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 0.336 $\text{\AA}^{-1}$

8.2 Resolution estimates [i](#)

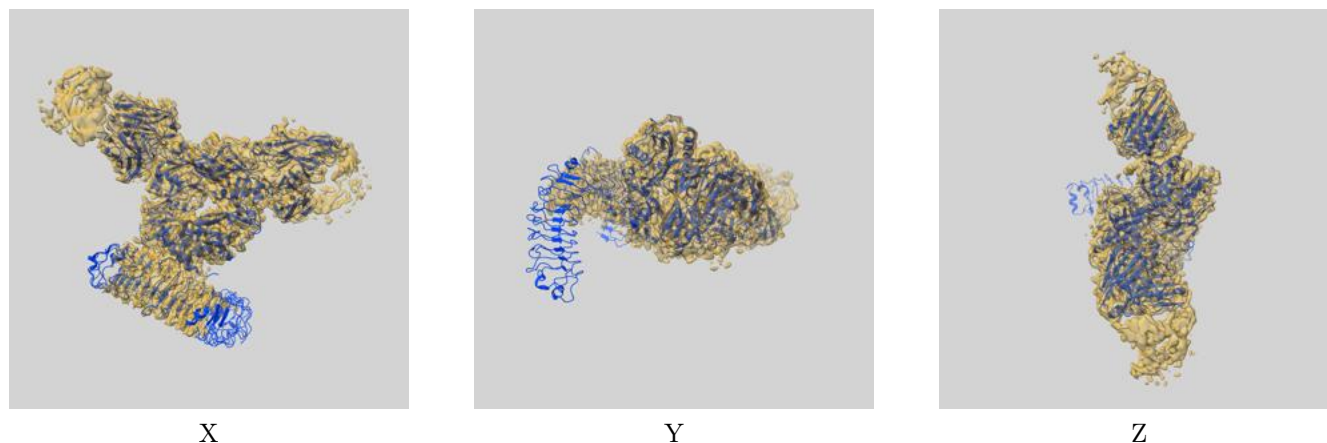
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.98	-	-
Author-provided FSC curve	2.89	3.32	2.98
Unmasked-calculated*	3.43	4.02	3.52

*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 3.43 differs from the reported value 2.98 by more than 10 %

9 Map-model fit [i](#)

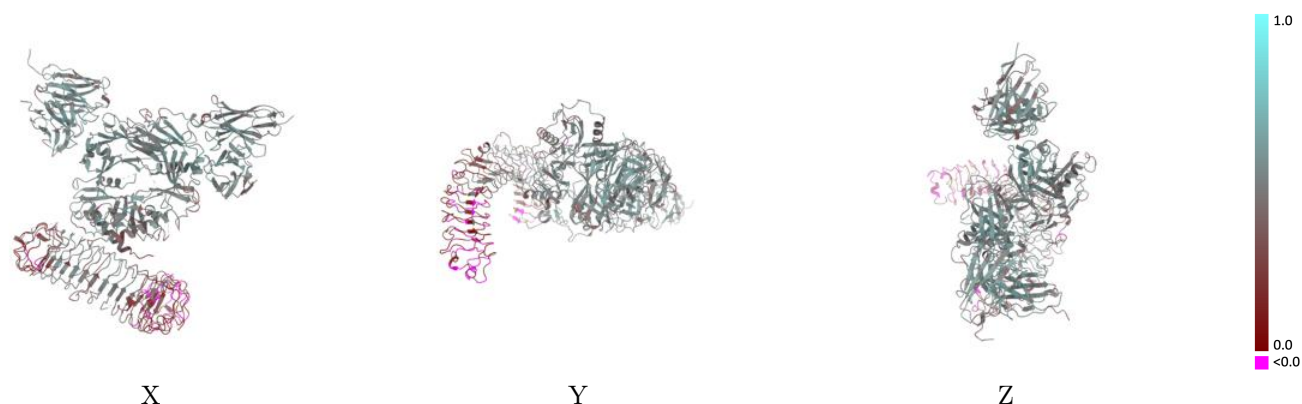
This section contains information regarding the fit between EMDB map EMD-19110 and PDB model 8REW. Per-residue inclusion information can be found in section [3](#) on page [8](#).

9.1 Map-model overlay [i](#)



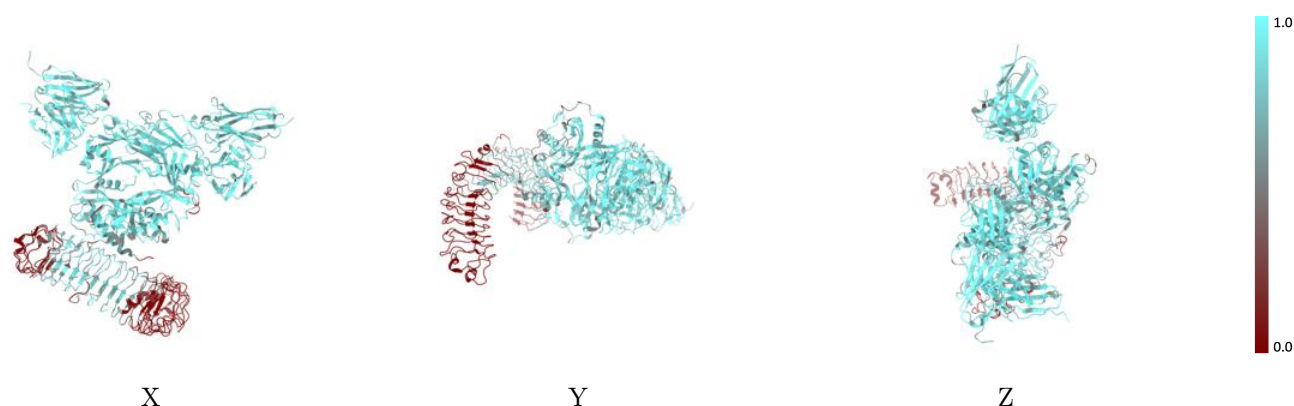
The images above show the 3D surface view of the map at the recommended contour level 0.06 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



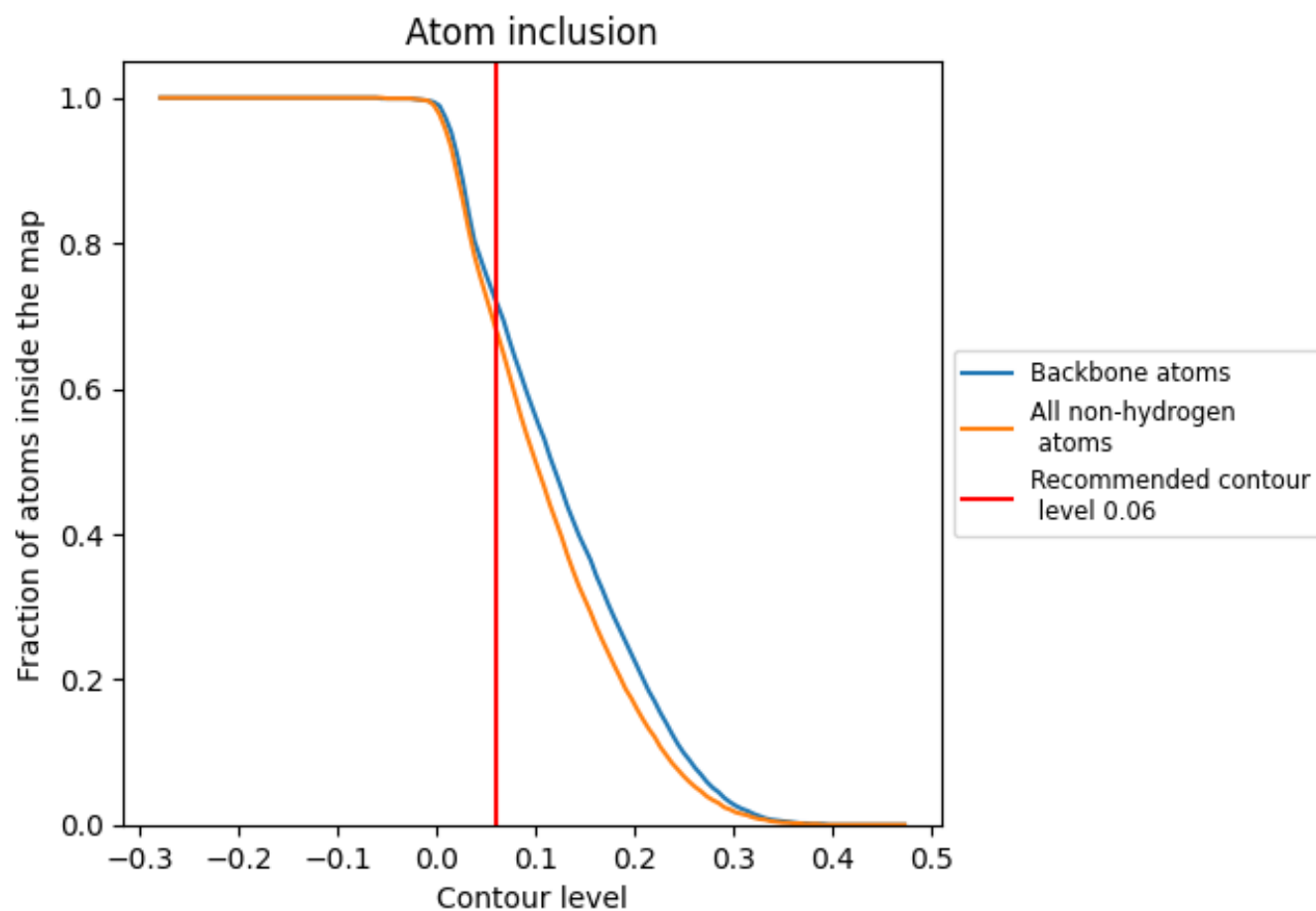
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.06).

9.4 Atom inclusion [i](#)



At the recommended contour level, 72% of all backbone atoms, 68% 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 (0.06) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.6810	0.4410
A	0.8380	0.5030
B	0.8550	0.5080
C	0.8670	0.5180
D	0.8330	0.4840
E	0.2930	0.2830
F	0.8640	0.5180
G	0.8370	0.5080
H	0.8700	0.5250
I	0.9000	0.5320
J	0.7800	0.4560
K	0.8000	0.4470
L	0.7500	0.4570

