



## Full wwPDB EM Validation Report ⓘ

May 19, 2025 – 07:37 AM EDT

PDB ID : 8D85 / pdb\_00008d85  
EMDB ID : EMD-27247  
Title : Cryo-EM structure of human IL-27 signaling complex: model containing the interaction core region  
Authors : Zhou, Y.; Franklin, M.C.  
Deposited on : 2022-06-07  
Resolution : 3.81 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](mailto: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>.

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

EMDB validation analysis : 0.0.1.dev118  
Mogul : 2022.3.0, CSD as543be (2022)  
MolProbity : 4-5-2 with Phenix2.0rc1  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
MapQ : 1.9.13  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.43.1

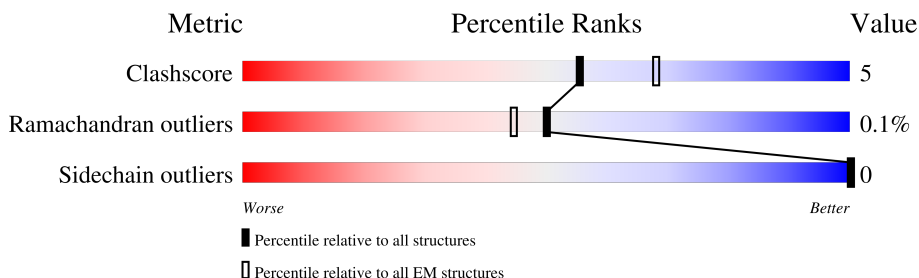
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 3.81 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)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

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  $\geq 3$ , 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 EM map (all-atom inclusion  $< 40\%$ ). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	C	209	
2	D	243	
3	A	512	
4	B	625	
5	E	2	
5	F	2	
5	G	2	

## 2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 7093 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 Interleukin-27 subunit beta.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	C	201	Total	C	N	O	S	0	0
			1590	1025	276	282	7		

- Molecule 2 is a protein called Interleukin-27 subunit alpha.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	D	177	Total	C	N	O	S	0	0
			1452	922	263	263	4		

There are 28 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
D	244	GLU	-	expression tag	UNP Q8NEV9
D	245	GLN	-	expression tag	UNP Q8NEV9
D	246	LYS	-	expression tag	UNP Q8NEV9
D	247	LEU	-	expression tag	UNP Q8NEV9
D	248	ILE	-	expression tag	UNP Q8NEV9
D	249	SER	-	expression tag	UNP Q8NEV9
D	250	GLU	-	expression tag	UNP Q8NEV9
D	251	GLU	-	expression tag	UNP Q8NEV9
D	252	ASP	-	expression tag	UNP Q8NEV9
D	253	LEU	-	expression tag	UNP Q8NEV9
D	254	GLY	-	expression tag	UNP Q8NEV9
D	255	GLY	-	expression tag	UNP Q8NEV9
D	256	GLU	-	expression tag	UNP Q8NEV9
D	257	GLN	-	expression tag	UNP Q8NEV9
D	258	LYS	-	expression tag	UNP Q8NEV9
D	259	LEU	-	expression tag	UNP Q8NEV9
D	260	ILE	-	expression tag	UNP Q8NEV9
D	261	SER	-	expression tag	UNP Q8NEV9
D	262	GLU	-	expression tag	UNP Q8NEV9
D	263	GLU	-	expression tag	UNP Q8NEV9
D	264	ASP	-	expression tag	UNP Q8NEV9

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Chain	Residue	Modelled	Actual	Comment	Reference
D	265	LEU	-	expression tag	UNP Q8NEV9
D	266	HIS	-	expression tag	UNP Q8NEV9
D	267	HIS	-	expression tag	UNP Q8NEV9
D	268	HIS	-	expression tag	UNP Q8NEV9
D	269	HIS	-	expression tag	UNP Q8NEV9
D	270	HIS	-	expression tag	UNP Q8NEV9
D	271	HIS	-	expression tag	UNP Q8NEV9

- Molecule 3 is a protein called Interleukin-27 receptor subunit alpha.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	A	191	Total	C	N	O	S	0	0
			1524	979	256	281	8		

There are 28 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	517	GLU	-	expression tag	UNP Q6UWB1
A	518	GLN	-	expression tag	UNP Q6UWB1
A	519	LYS	-	expression tag	UNP Q6UWB1
A	520	LEU	-	expression tag	UNP Q6UWB1
A	521	ILE	-	expression tag	UNP Q6UWB1
A	522	SER	-	expression tag	UNP Q6UWB1
A	523	GLU	-	expression tag	UNP Q6UWB1
A	524	GLU	-	expression tag	UNP Q6UWB1
A	525	ASP	-	expression tag	UNP Q6UWB1
A	526	LEU	-	expression tag	UNP Q6UWB1
A	527	GLY	-	expression tag	UNP Q6UWB1
A	528	GLY	-	expression tag	UNP Q6UWB1
A	529	GLU	-	expression tag	UNP Q6UWB1
A	530	GLN	-	expression tag	UNP Q6UWB1
A	531	LYS	-	expression tag	UNP Q6UWB1
A	532	LEU	-	expression tag	UNP Q6UWB1
A	533	ILE	-	expression tag	UNP Q6UWB1
A	534	SER	-	expression tag	UNP Q6UWB1
A	535	GLU	-	expression tag	UNP Q6UWB1
A	536	GLU	-	expression tag	UNP Q6UWB1
A	537	ASP	-	expression tag	UNP Q6UWB1
A	538	LEU	-	expression tag	UNP Q6UWB1
A	539	HIS	-	expression tag	UNP Q6UWB1
A	540	HIS	-	expression tag	UNP Q6UWB1
A	541	HIS	-	expression tag	UNP Q6UWB1

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Chain	Residue	Modelled	Actual	Comment	Reference
A	542	HIS	-	expression tag	UNP Q6UWB1
A	543	HIS	-	expression tag	UNP Q6UWB1
A	544	HIS	-	expression tag	UNP Q6UWB1

- Molecule 4 is a protein called Interleukin-6 receptor subunit beta.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	B	296	Total	C	N	O	S	0	0
			2373	1513	391	457	12		

There are 28 discrepancies between the modelled and reference sequences:

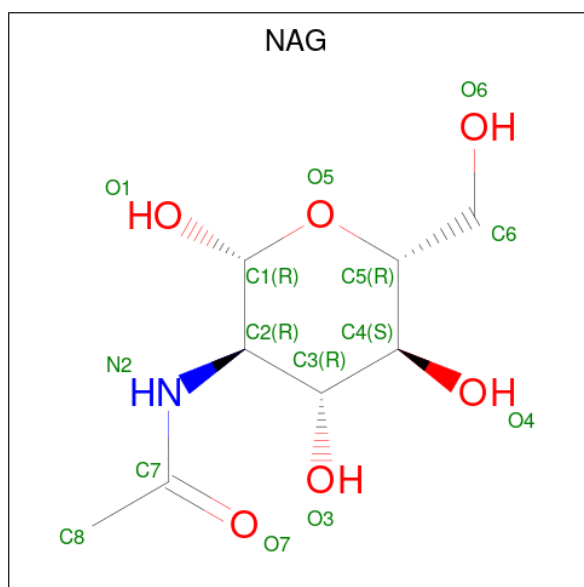
Chain	Residue	Modelled	Actual	Comment	Reference
B	620	GLU	-	expression tag	UNP P40189
B	621	GLN	-	expression tag	UNP P40189
B	622	LYS	-	expression tag	UNP P40189
B	623	LEU	-	expression tag	UNP P40189
B	624	ILE	-	expression tag	UNP P40189
B	625	SER	-	expression tag	UNP P40189
B	626	GLU	-	expression tag	UNP P40189
B	627	GLU	-	expression tag	UNP P40189
B	628	ASP	-	expression tag	UNP P40189
B	629	LEU	-	expression tag	UNP P40189
B	630	GLY	-	expression tag	UNP P40189
B	631	GLY	-	expression tag	UNP P40189
B	632	GLU	-	expression tag	UNP P40189
B	633	GLN	-	expression tag	UNP P40189
B	634	LYS	-	expression tag	UNP P40189
B	635	LEU	-	expression tag	UNP P40189
B	636	ILE	-	expression tag	UNP P40189
B	637	SER	-	expression tag	UNP P40189
B	638	GLU	-	expression tag	UNP P40189
B	639	GLU	-	expression tag	UNP P40189
B	640	ASP	-	expression tag	UNP P40189
B	641	LEU	-	expression tag	UNP P40189
B	642	HIS	-	expression tag	UNP P40189
B	643	HIS	-	expression tag	UNP P40189
B	644	HIS	-	expression tag	UNP P40189
B	645	HIS	-	expression tag	UNP P40189
B	646	HIS	-	expression tag	UNP P40189
B	647	HIS	-	expression tag	UNP P40189

- Molecule 5 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
5	E	2	Total	C	N	O	0	0
			28	16	2	10		
5	F	2	Total	C	N	O	0	0
			28	16	2	10		
5	G	2	Total	C	N	O	0	0
			28	16	2	10		

- Molecule 6 is 2-acetamido-2-deoxy-beta-D-glucopyranose (CCD ID: NAG) (formula:  $C_8H_{15}NO_6$ ).

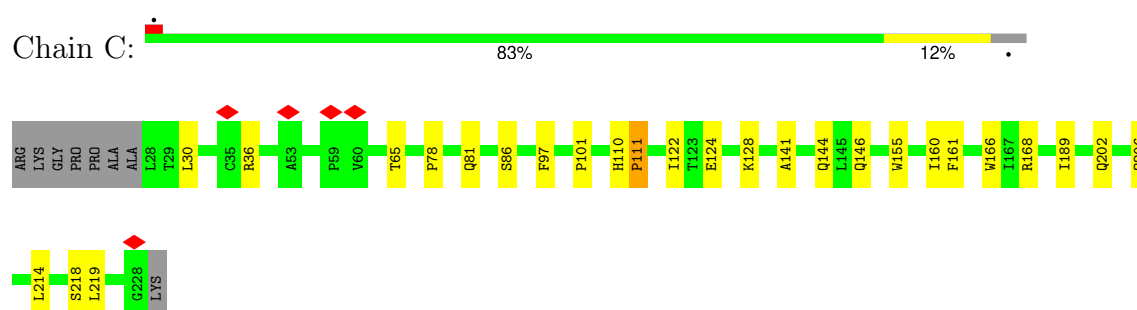


Mol	Chain	Residues	Atoms				AltConf
6	C	1	Total	C	N	O	0
			14	8	1	5	
6	A	1	Total	C	N	O	0
			14	8	1	5	
6	B	1	Total	C	N	O	0
			14	8	1	5	
6	B	1	Total	C	N	O	0
			14	8	1	5	
6	B	1	Total	C	N	O	0
			14	8	1	5	

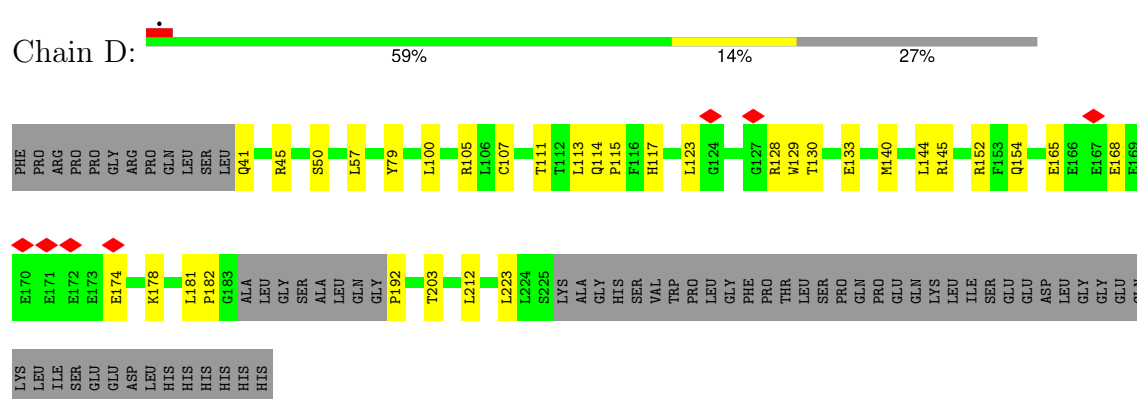
### 3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion in map density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red diamond above a residue indicates a poor fit to the EM map for this residue (all-atom inclusion < 40%). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

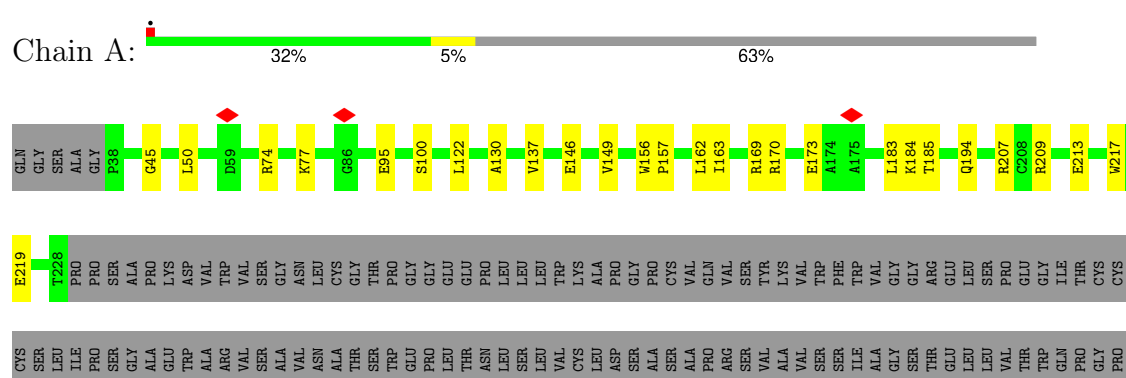
- Molecule 1: Interleukin-27 subunit beta

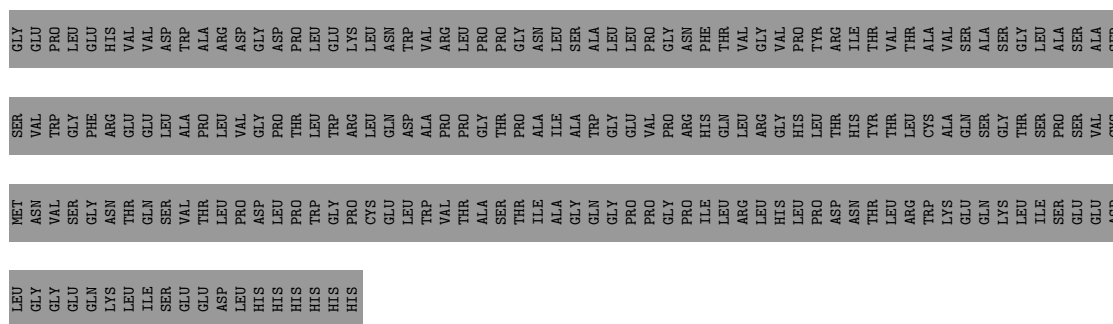


- Molecule 2: Interleukin-27 subunit alpha

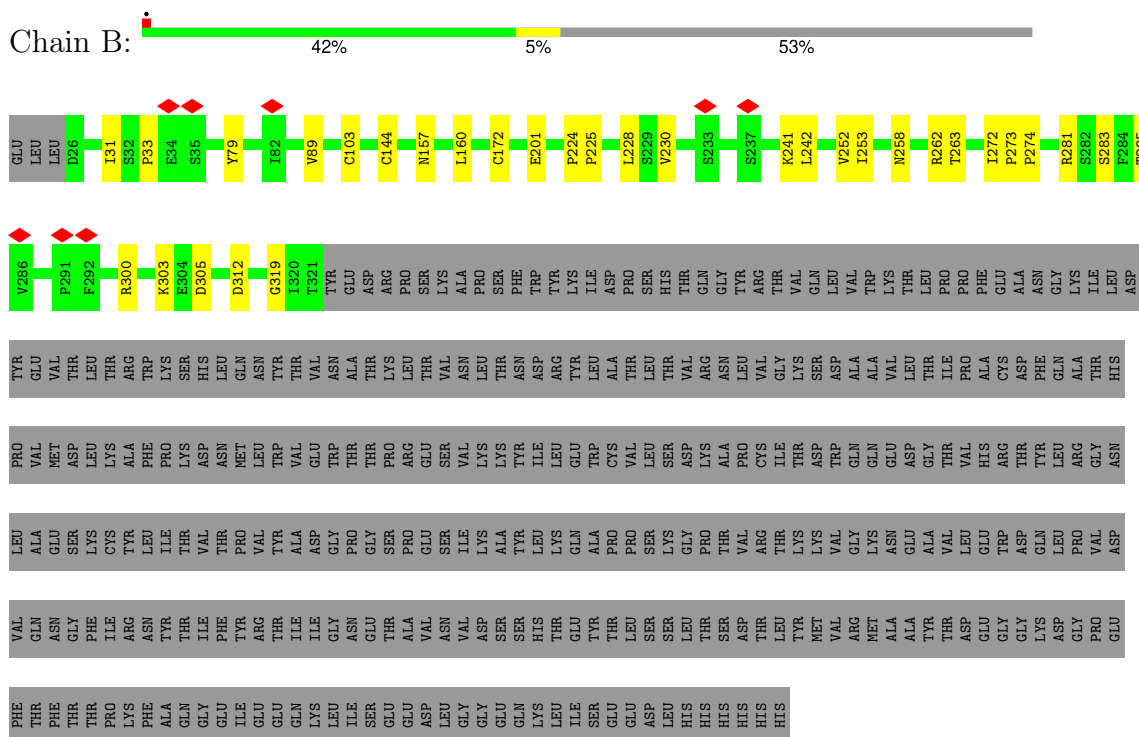


- Molecule 3: Interleukin-27 receptor subunit alpha

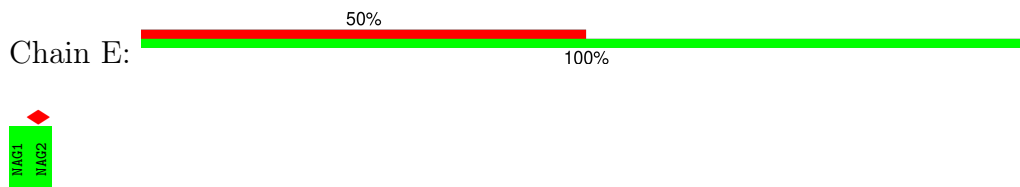




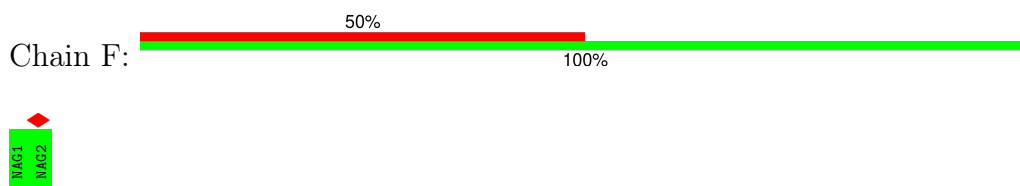
- Molecule 4: Interleukin-6 receptor subunit beta



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



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





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

Chain G:

100%

MAG1  
MAG2

## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	139752	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	40	Depositor
Minimum defocus (nm)	1400	Depositor
Maximum defocus (nm)	2600	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	0.934	Depositor
Minimum map value	-0.449	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.019	Depositor
Recommended contour level	0.08	Depositor
Map size (Å)	326.80002, 326.80002, 326.80002	wwPDB
Map dimensions	380, 380, 380	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.8600001, 0.8600001, 0.8600001	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

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	C	0.09	0/1645	0.28	0/2258
2	D	0.11	0/1482	0.28	0/2003
3	A	0.08	0/1573	0.27	0/2153
4	B	0.08	0/2435	0.23	0/3318
All	All	0.09	0/7135	0.26	0/9732

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	C	1590	0	1563	16	0
2	D	1452	0	1456	20	0
3	A	1524	0	1483	16	0
4	B	2373	0	2307	19	0
5	E	28	0	25	0	0
5	F	28	0	25	0	0
5	G	28	0	25	0	0
6	A	14	0	13	0	0
6	B	42	0	39	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
6	C	14	0	13	0	0
All	All	7093	0	6949	67	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 5.

All (67) 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)
4:B:160:LEU:HB3	4:B:172:CYS:HB3	1.70	0.71
1:C:110:HIS:HB2	1:C:111:PRO:HD3	1.80	0.62
4:B:224:PRO:HG3	4:B:312:ASP:HB2	1.83	0.61
3:A:130:ALA:HB2	3:A:219:GLU:HG3	1.82	0.60
1:C:81:GLN:NE2	1:C:86:SER:O	2.36	0.59
2:D:113:LEU:HD12	2:D:144:LEU:HD11	1.85	0.58
1:C:36:ARG:HG3	1:C:128:LYS:HB3	1.85	0.58
1:C:168:ARG:NH2	1:C:202:GLN:OE1	2.37	0.57
1:C:166:TRP:NE1	1:C:206:GLN:OE1	2.37	0.56
2:D:129:TRP:HE3	2:D:133:GLU:HG3	1.72	0.55
2:D:41:GLN:O	2:D:45:ARG:NH1	2.40	0.55
2:D:174:GLU:O	2:D:178:LYS:HG2	2.07	0.55
2:D:145:ARG:NH1	3:A:95:GLU:OE2	2.39	0.54
4:B:31:ILE:HG22	4:B:33:PRO:HD3	1.90	0.54
3:A:169:ARG:NH2	3:A:170:ARG:O	2.41	0.54
3:A:45:GLY:O	3:A:156:TRP:NE1	2.41	0.53
4:B:253:ILE:HD12	4:B:303:LYS:HG3	1.89	0.53
3:A:169:ARG:NH2	3:A:173:GLU:O	2.42	0.53
4:B:144:CYS:HB2	4:B:160:LEU:HD11	1.90	0.53
1:C:101:PRO:HG3	2:D:79:TYR:HB3	1.92	0.52
3:A:209:ARG:NH1	3:A:213:GLU:O	2.42	0.52
4:B:262:ARG:NH1	4:B:263:THR:O	2.43	0.51
1:C:160:ILE:HG23	2:D:223:LEU:HD13	1.92	0.51
3:A:137:VAL:HG12	3:A:149:VAL:HG12	1.92	0.51
1:C:155:TRP:HE1	1:C:161:PHE:HB2	1.76	0.50
3:A:100:SER:H	3:A:122:LEU:HD23	1.78	0.49
1:C:218:SER:OG	1:C:219:LEU:N	2.45	0.49
3:A:74:ARG:HD3	3:A:77:LYS:HG3	1.95	0.48
3:A:163:ILE:HG22	3:A:184:LYS:HG2	1.95	0.48
4:B:258:ASN:HD22	4:B:300:ARG:HE	1.61	0.48
2:D:57:LEU:HD11	2:D:140:MET:HG2	1.95	0.48
4:B:241:LYS:HG2	4:B:285:THR:HG22	1.95	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:207:ARG:HD2	3:A:217:TRP:HB3	1.96	0.48
2:D:123:LEU:HD11	2:D:203:THR:HG23	1.96	0.47
2:D:152:ARG:NH1	2:D:165:GLU:OE1	2.47	0.47
2:D:50:SER:OG	2:D:154:GLN:NE2	2.49	0.46
3:A:156:TRP:HB3	3:A:157:PRO:HD3	1.98	0.46
4:B:31:ILE:HD11	4:B:103:CYS:HB2	1.97	0.46
2:D:165:GLU:HB3	2:D:168:GLU:HB2	1.96	0.46
2:D:130:THR:N	2:D:133:GLU:OE2	2.40	0.46
1:C:128:LYS:NZ	1:C:214:LEU:O	2.49	0.45
2:D:100:LEU:HD12	2:D:105:ARG:HE	1.82	0.45
4:B:228:LEU:HD21	4:B:242:LEU:HD11	1.99	0.44
2:D:128:ARG:NH1	2:D:192:PRO:O	2.50	0.44
3:A:183:LEU:HD23	3:A:183:LEU:H	1.82	0.44
2:D:181:LEU:HD12	2:D:182:PRO:HD2	1.99	0.43
2:D:114:GLN:HA	2:D:117:HIS:HD1	1.83	0.43
1:C:97:PHE:HB3	2:D:212:LEU:HD21	1.99	0.43
4:B:224:PRO:HA	4:B:225:PRO:HD3	1.90	0.43
3:A:162:LEU:HD23	3:A:185:THR:HG21	2.00	0.43
4:B:79:TYR:HB3	4:B:89:VAL:HG22	2.00	0.43
1:C:146:GLN:HA	1:C:189:ILE:HA	2.00	0.43
4:B:273:PRO:HA	4:B:274:PRO:HD3	1.95	0.42
1:C:65:THR:HG22	1:C:78:PRO:HA	2.00	0.42
1:C:122:ILE:HG22	1:C:124:GLU:H	1.84	0.42
4:B:157:ASN:HB2	4:B:201:GLU:HB3	2.01	0.42
1:C:141:ALA:HB3	1:C:144:GLN:HB2	2.02	0.42
4:B:252:VAL:HG12	4:B:253:ILE:HG23	2.01	0.42
1:C:30:LEU:H	1:C:30:LEU:HD23	1.85	0.42
4:B:272:ILE:HG13	4:B:273:PRO:HD2	2.03	0.41
3:A:50:LEU:HD12	3:A:122:LEU:HD13	2.03	0.41
3:A:146:GLU:HG2	3:A:194:GLN:HG2	2.03	0.41
2:D:107:CYS:O	2:D:111:THR:HG23	2.21	0.41
2:D:114:GLN:HB2	2:D:115:PRO:HD3	2.03	0.41
4:B:303:LYS:NZ	4:B:305:ASP:OD2	2.49	0.41
4:B:281:ARG:NE	4:B:283:SER:O	2.55	0.40
4:B:230:VAL:HG11	4:B:319:GLY:HA3	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	C	199/209 (95%)	189 (95%)	9 (4%)	1 (0%)	25	60
2	D	173/243 (71%)	172 (99%)	1 (1%)	0	100	100
3	A	189/512 (37%)	181 (96%)	8 (4%)	0	100	100
4	B	294/625 (47%)	277 (94%)	17 (6%)	0	100	100
All	All	855/1589 (54%)	819 (96%)	35 (4%)	1 (0%)	50	80

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	111	PRO

### 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	C	174/179 (97%)	174 (100%)	0	100	100
2	D	157/213 (74%)	157 (100%)	0	100	100
3	A	167/432 (39%)	167 (100%)	0	100	100
4	B	273/566 (48%)	273 (100%)	0	100	100
All	All	771/1390 (56%)	771 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (12) such sidechains are listed below:

Mol	Chain	Res	Type
1	C	81	GLN
1	C	95	GLN
2	D	41	GLN
2	D	86	GLN
2	D	126	GLN
2	D	154	GLN
2	D	208	HIS
3	A	96	GLN
3	A	194	GLN
4	B	193	ASN
4	B	246	ASN
4	B	258	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 ⓘ

6 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	E	1	3,5	14,14,15	0.41	0	17,19,21	0.43	0
5	NAG	E	2	5	14,14,15	0.30	0	17,19,21	0.56	0
5	NAG	F	1	4,5	14,14,15	0.45	0	17,19,21	0.37	0
5	NAG	F	2	5	14,14,15	0.29	0	17,19,21	0.57	0
5	NAG	G	1	4,5	14,14,15	0.42	0	17,19,21	0.37	0
5	NAG	G	2	5	14,14,15	0.30	0	17,19,21	0.55	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	E	1	3,5	-	0/6/23/26	0/1/1/1
5	NAG	E	2	5	-	4/6/23/26	0/1/1/1
5	NAG	F	1	4,5	-	2/6/23/26	0/1/1/1
5	NAG	F	2	5	-	2/6/23/26	0/1/1/1
5	NAG	G	1	4,5	-	0/6/23/26	0/1/1/1
5	NAG	G	2	5	-	4/6/23/26	0/1/1/1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (12) torsion outliers are listed below:

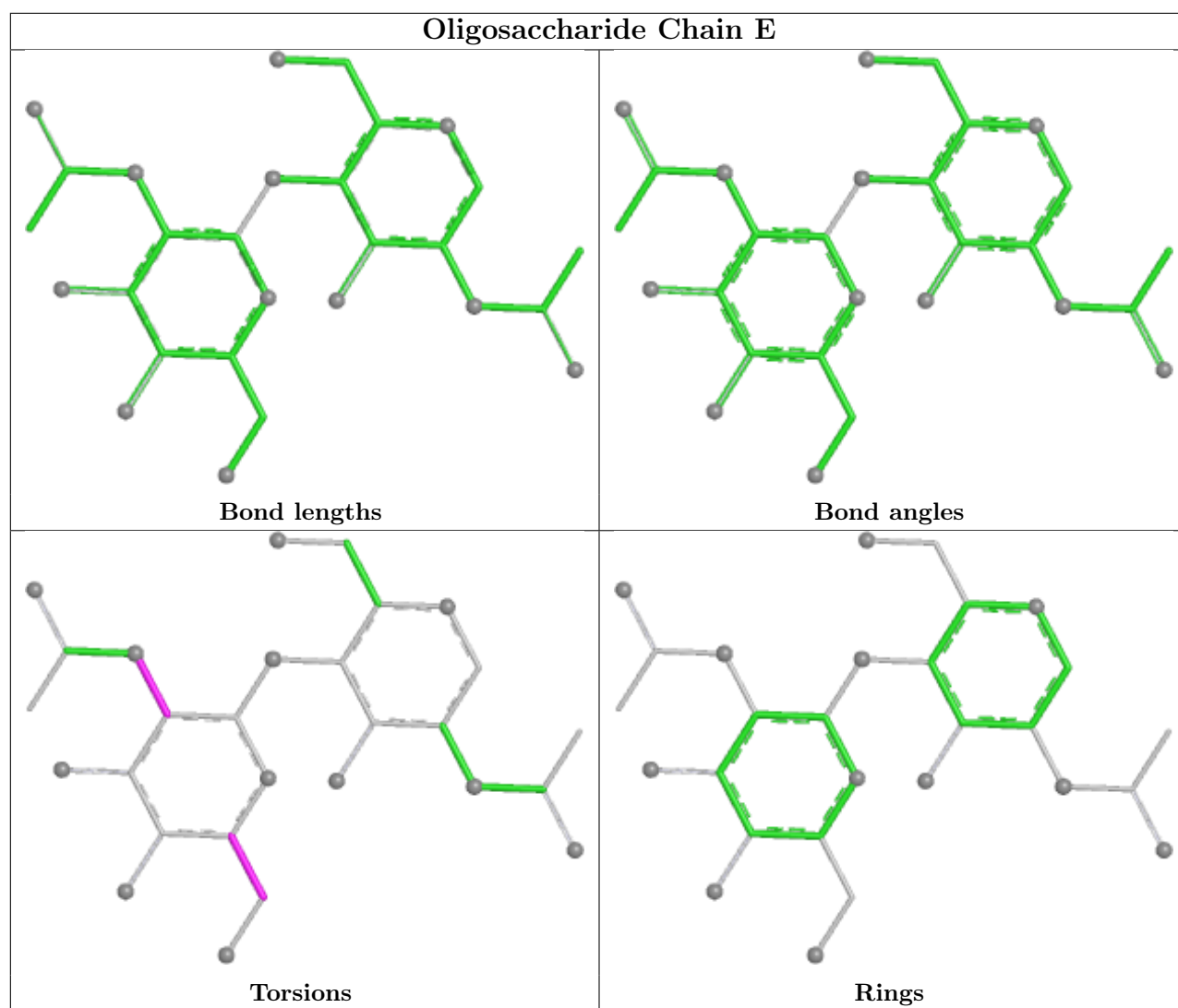
Mol	Chain	Res	Type	Atoms
5	E	2	NAG	O5-C5-C6-O6
5	G	2	NAG	O5-C5-C6-O6
5	E	2	NAG	C4-C5-C6-O6
5	G	2	NAG	C4-C5-C6-O6
5	E	2	NAG	C1-C2-N2-C7
5	F	2	NAG	C1-C2-N2-C7
5	G	2	NAG	C1-C2-N2-C7
5	F	1	NAG	C4-C5-C6-O6
5	F	1	NAG	O5-C5-C6-O6
5	E	2	NAG	C3-C2-N2-C7
5	F	2	NAG	C3-C2-N2-C7
5	G	2	NAG	C3-C2-N2-C7

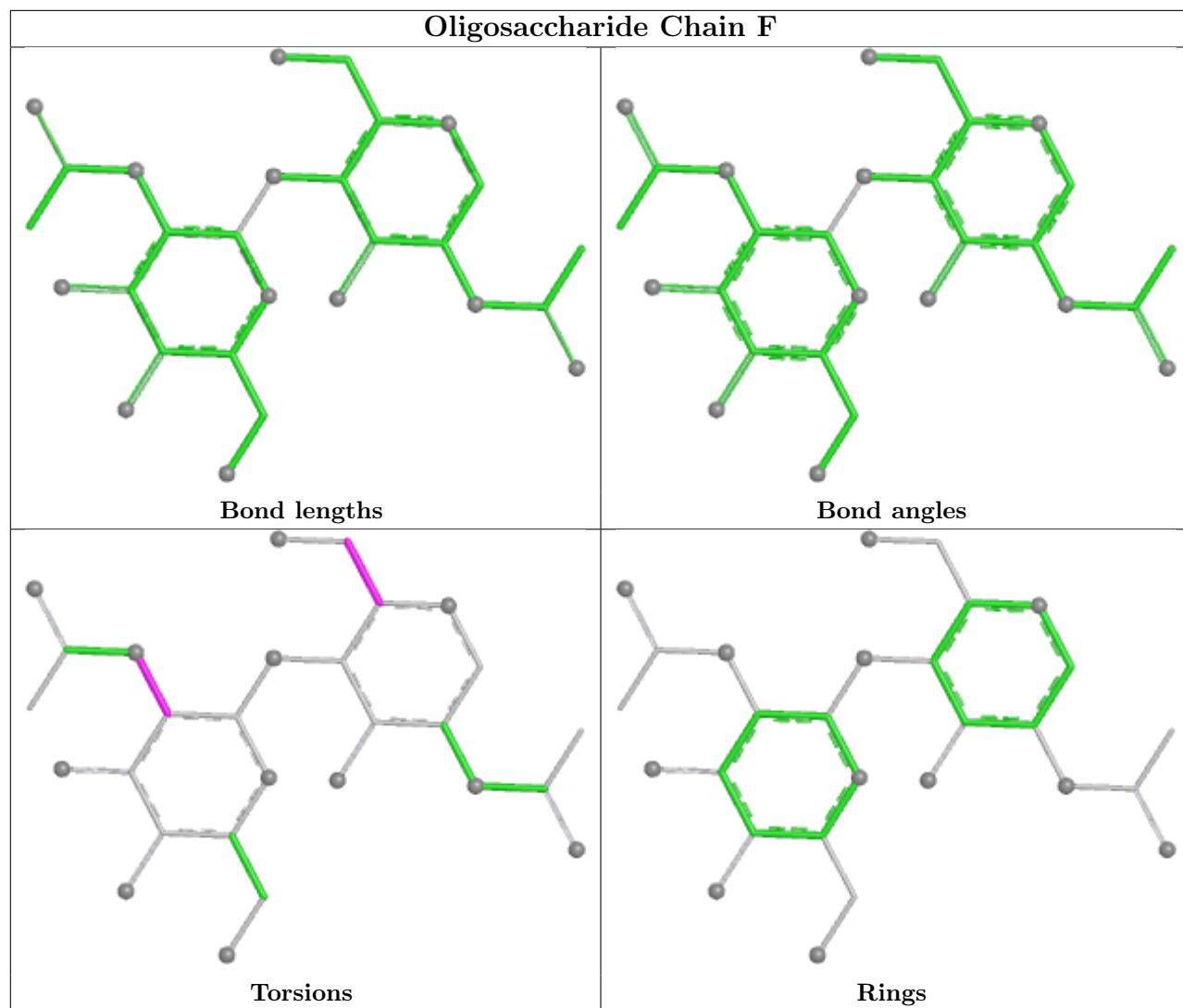
There are no ring outliers.

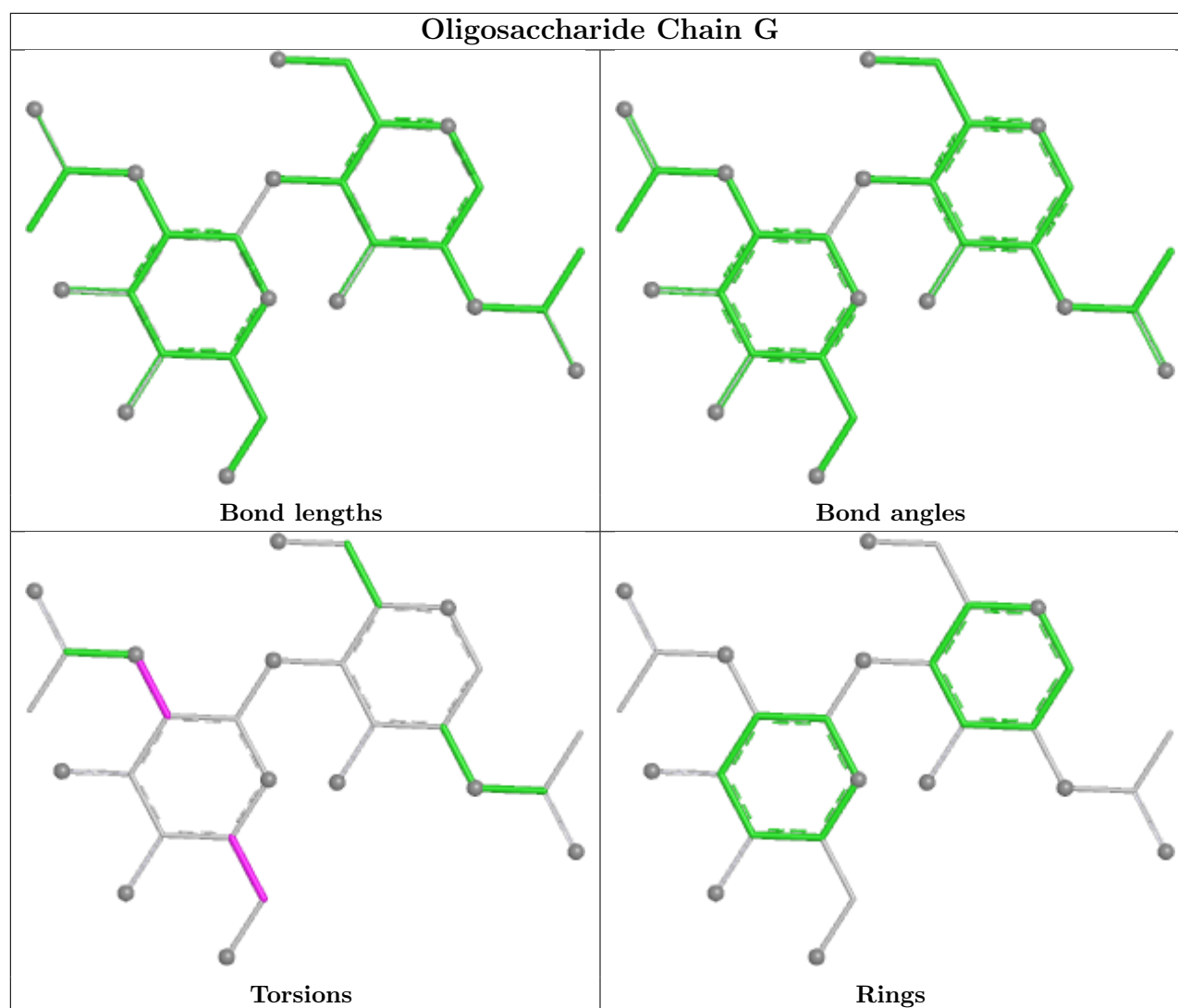
No monomer is involved in short contacts.

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for 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	$\# Z  > 2$
6	NAG	C	301	1	14,14,15	0.38	0	17,19,21	0.39	0
6	NAG	B	701	4	14,14,15	0.40	0	17,19,21	0.38	0
6	NAG	A	601	3	14,14,15	0.34	0	17,19,21	0.34	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
6	NAG	B	702	4	14,14,15	0.27	0	17,19,21	0.56	0
6	NAG	B	703	4	14,14,15	0.40	0	17,19,21	0.38	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
6	NAG	C	301	1	-	0/6/23/26	0/1/1/1
6	NAG	B	701	4	-	2/6/23/26	0/1/1/1
6	NAG	A	601	3	-	2/6/23/26	0/1/1/1
6	NAG	B	702	4	-	4/6/23/26	0/1/1/1
6	NAG	B	703	4	-	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 (8) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	B	702	NAG	O5-C5-C6-O6
6	B	702	NAG	C4-C5-C6-O6
6	A	601	NAG	O5-C5-C6-O6
6	A	601	NAG	C4-C5-C6-O6
6	B	701	NAG	O5-C5-C6-O6
6	B	702	NAG	C1-C2-N2-C7
6	B	702	NAG	C3-C2-N2-C7
6	B	701	NAG	C4-C5-C6-O6

There are no ring outliers.

No monomer is involved in short contacts.

## 5.7 Other polymers

There are no such residues in this entry.

## 5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

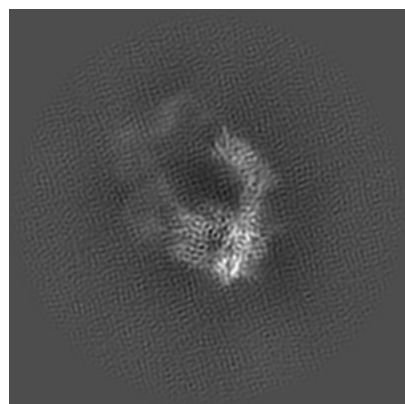
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-27247. These allow visual inspection of the internal detail of the map and identification of artifacts.

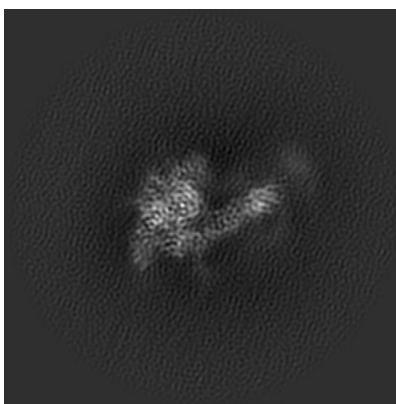
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

### 6.1 Orthogonal projections [i](#)

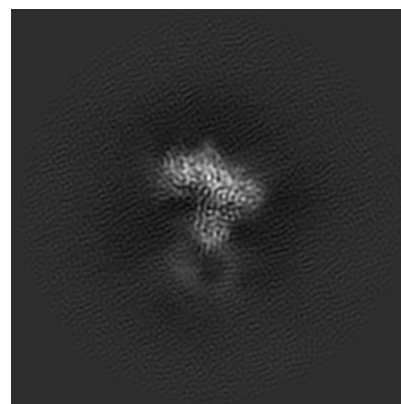
#### 6.1.1 Primary map



X

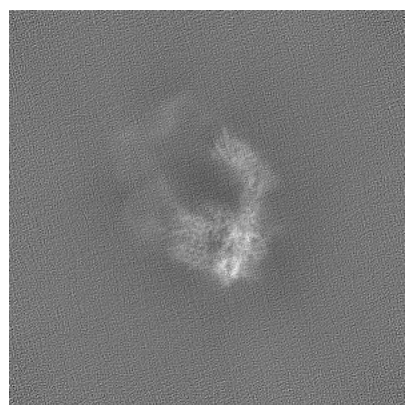


Y

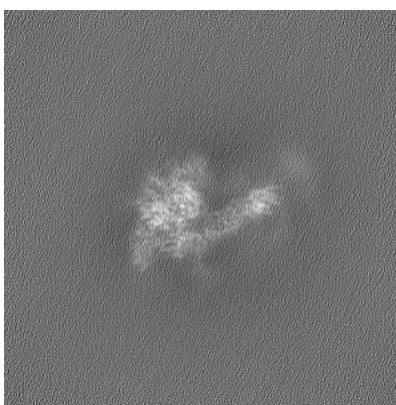


Z

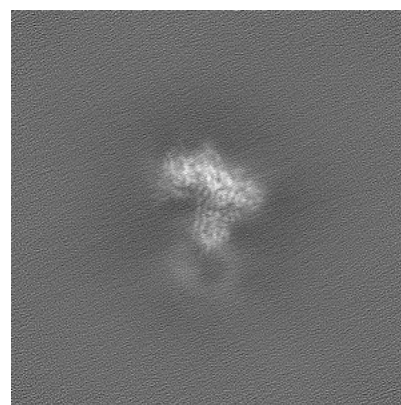
#### 6.1.2 Raw map



X



Y

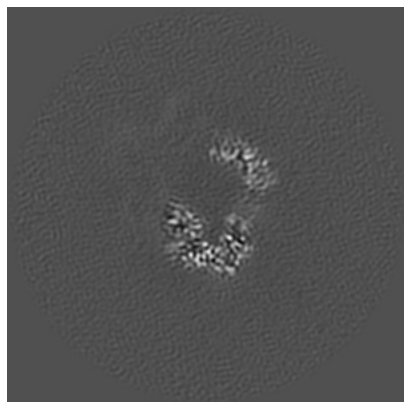


Z

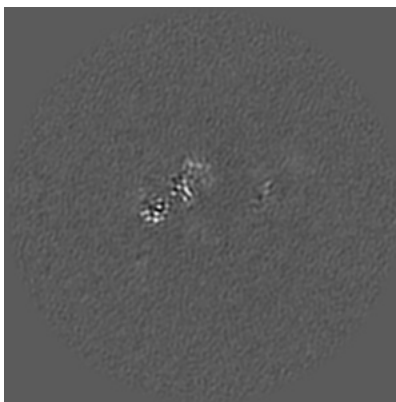
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices [i](#)

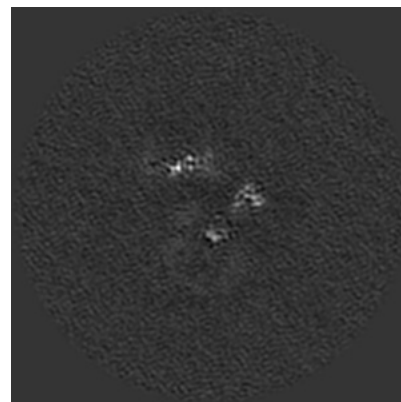
### 6.2.1 Primary map



X Index: 190

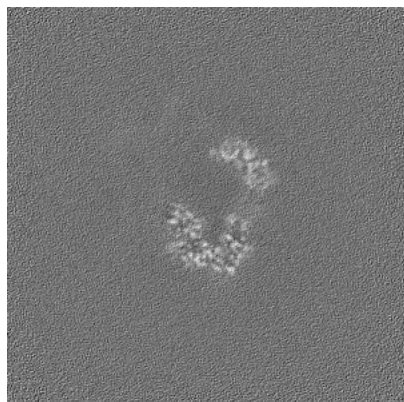


Y Index: 190

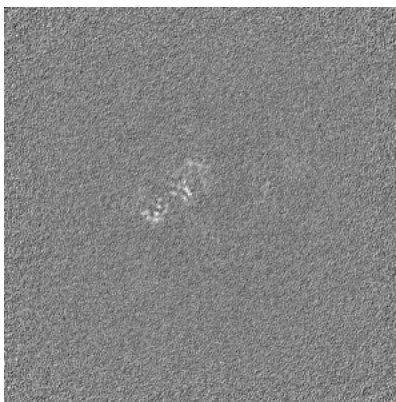


Z Index: 190

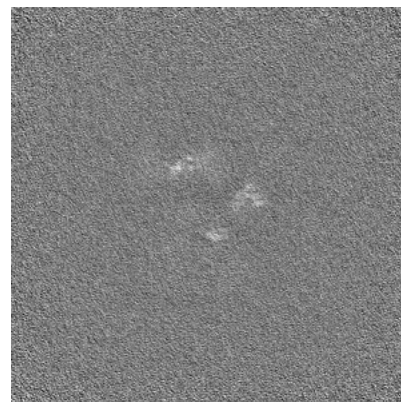
### 6.2.2 Raw map



X Index: 190



Y Index: 190



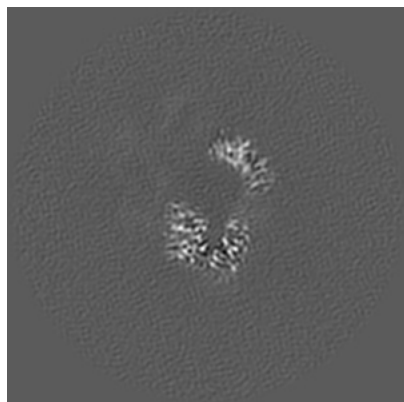
Z Index: 190

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

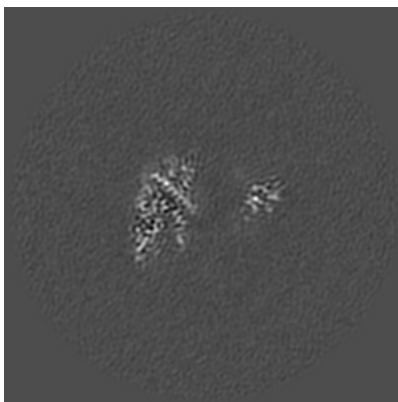


## 6.3 Largest variance slices [i](#)

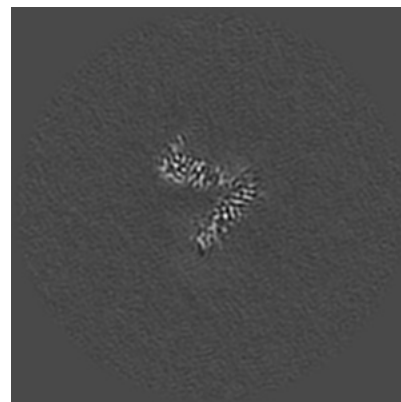
### 6.3.1 Primary map



X Index: 193

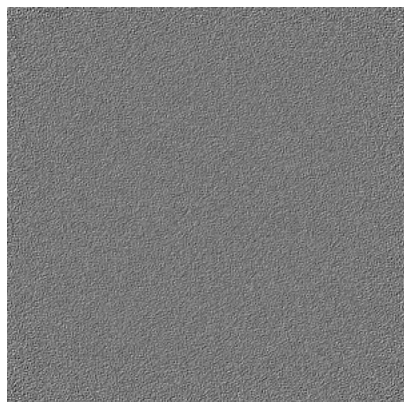


Y Index: 214

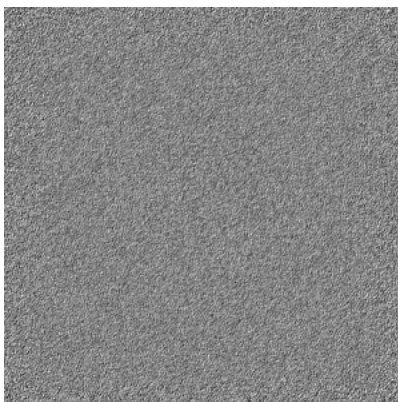


Z Index: 167

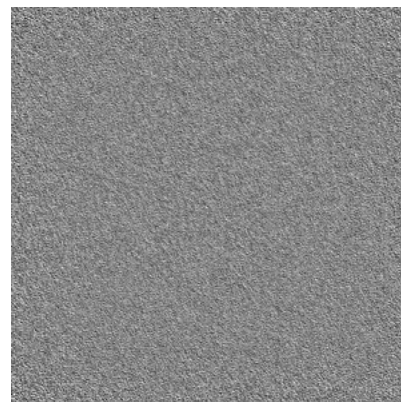
### 6.3.2 Raw map



X Index: 0



Y Index: 0



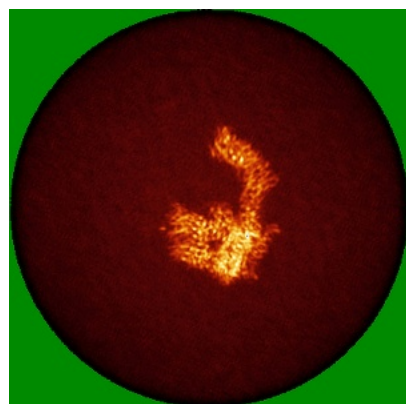
Z Index: 0

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

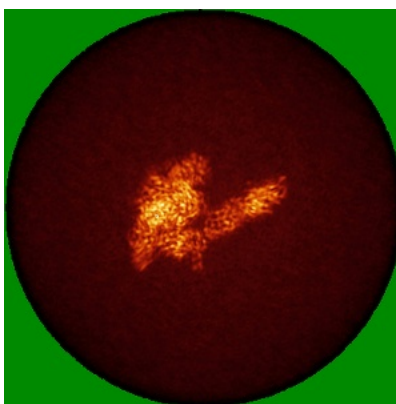


## 6.4 Orthogonal standard-deviation projections (False-color) [i](#)

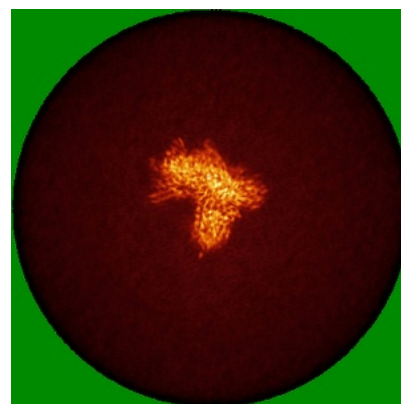
### 6.4.1 Primary map



X

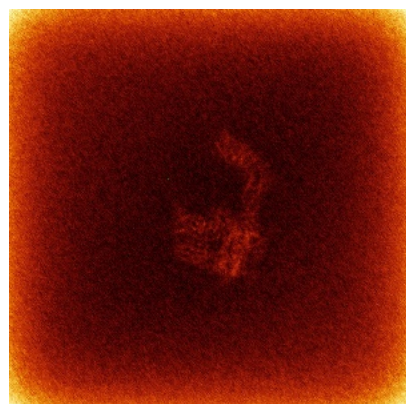


Y

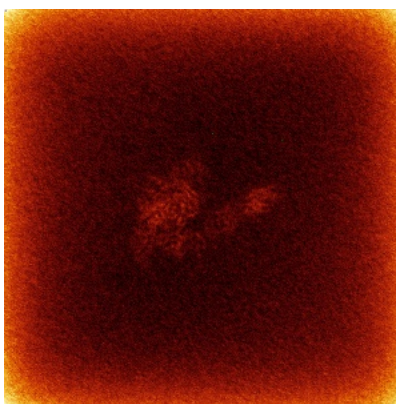


Z

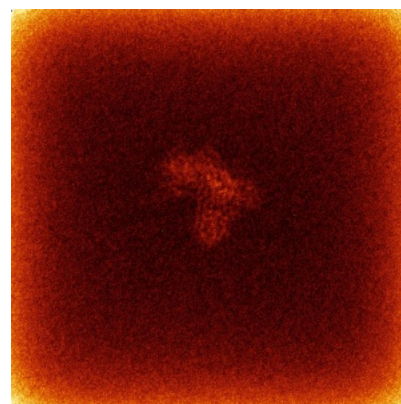
### 6.4.2 Raw map



X



Y

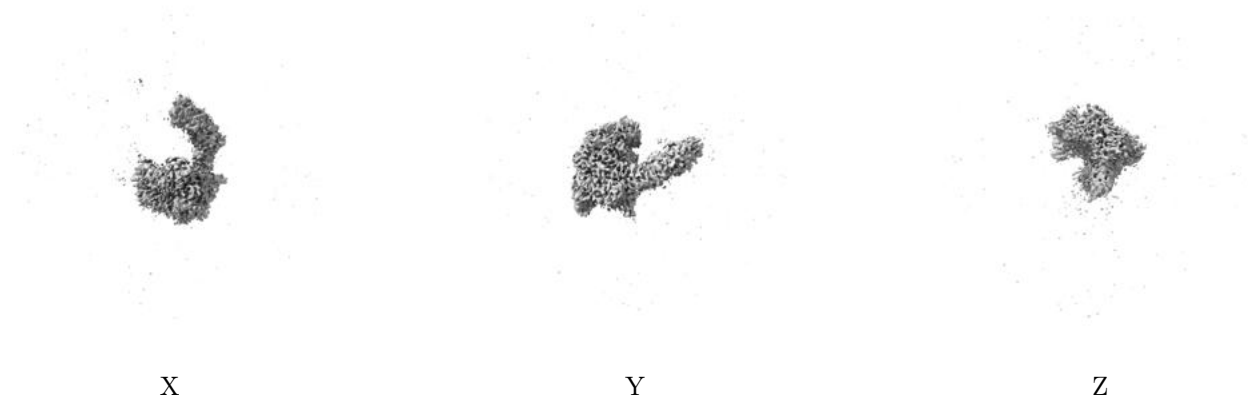


Z

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.

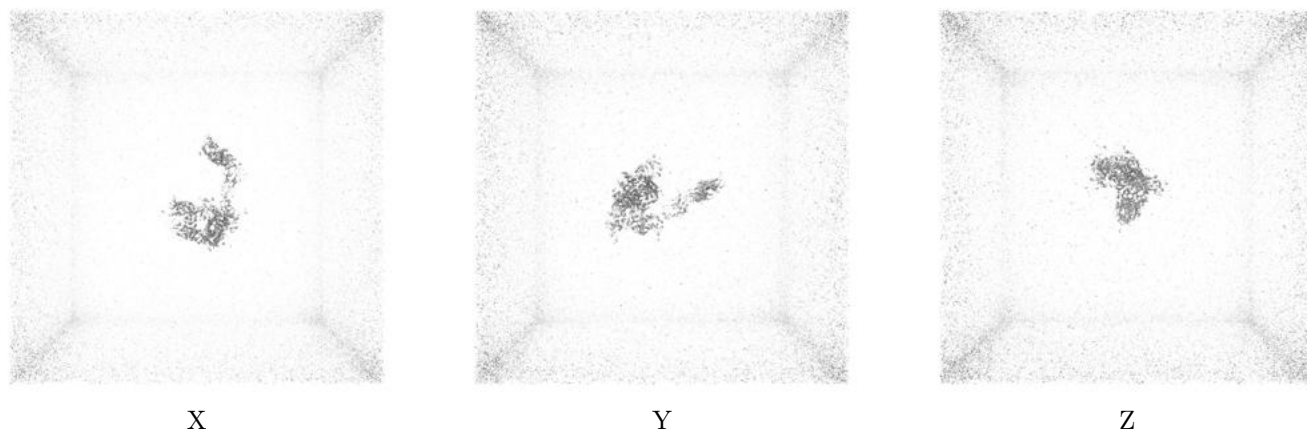
## 6.5 Orthogonal surface views [i](#)

### 6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.08. 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.

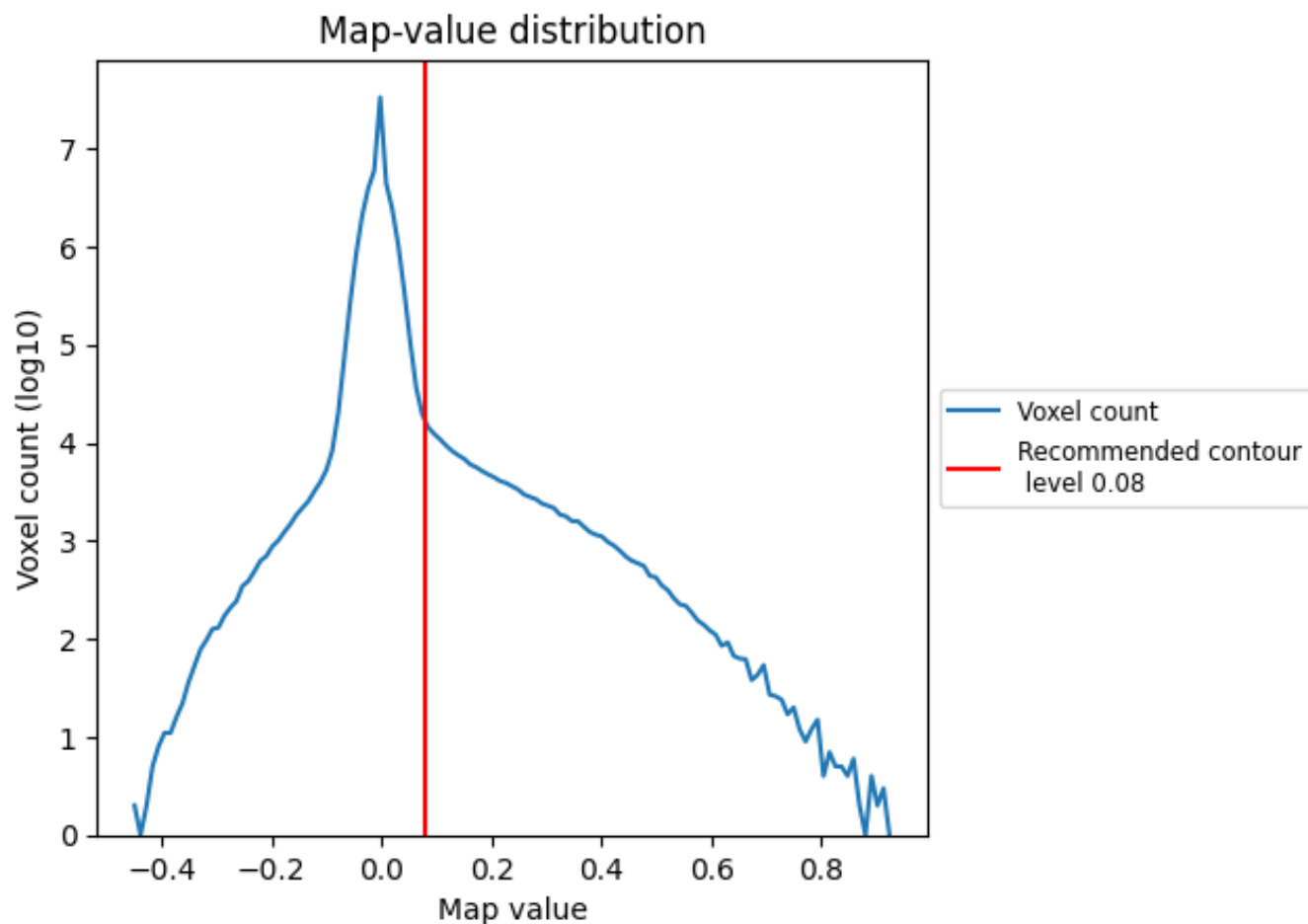
## 6.6 Mask visualisation [i](#)

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

## 7 Map analysis [i](#)

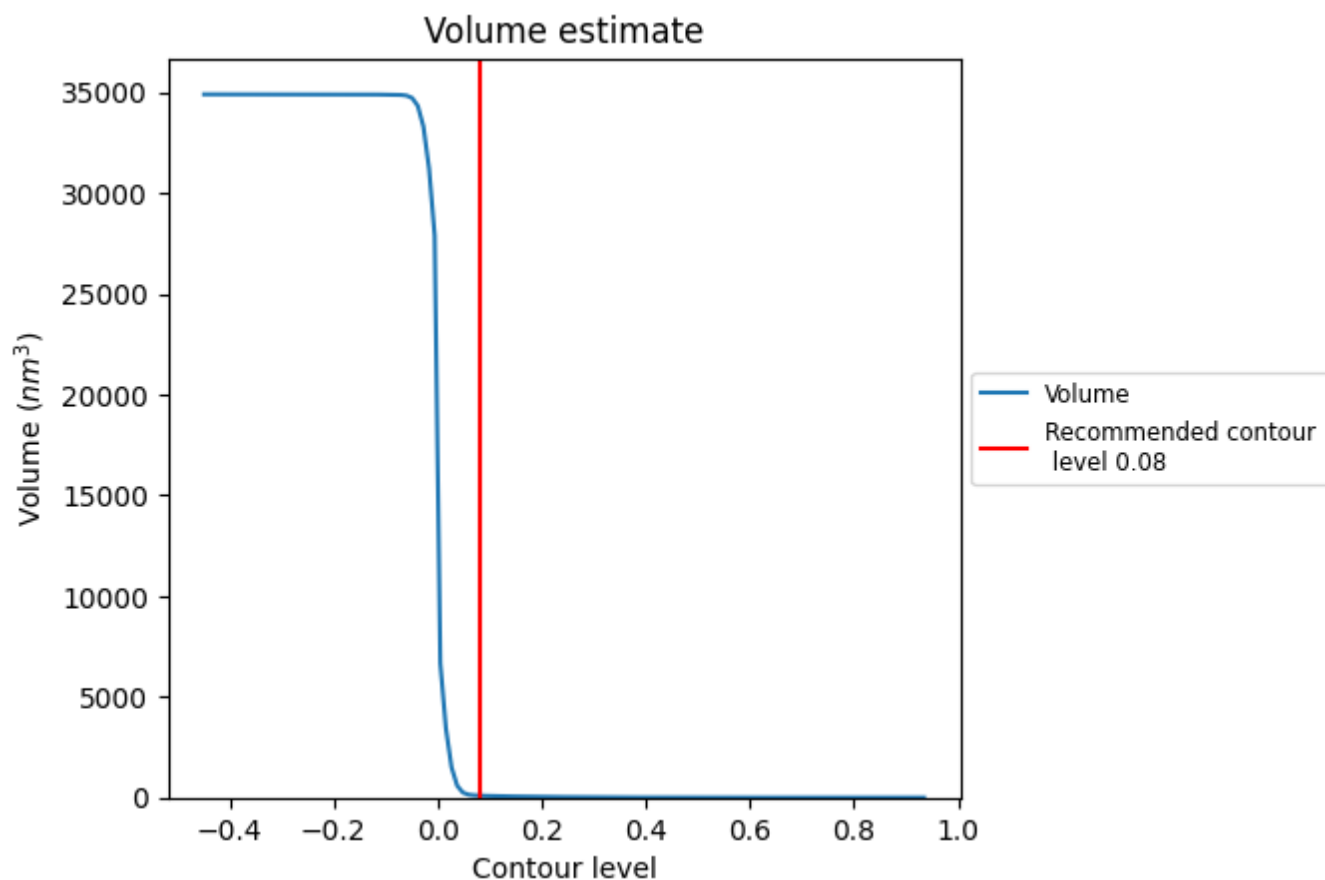
This section contains the results of statistical analysis of the map.

### 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.

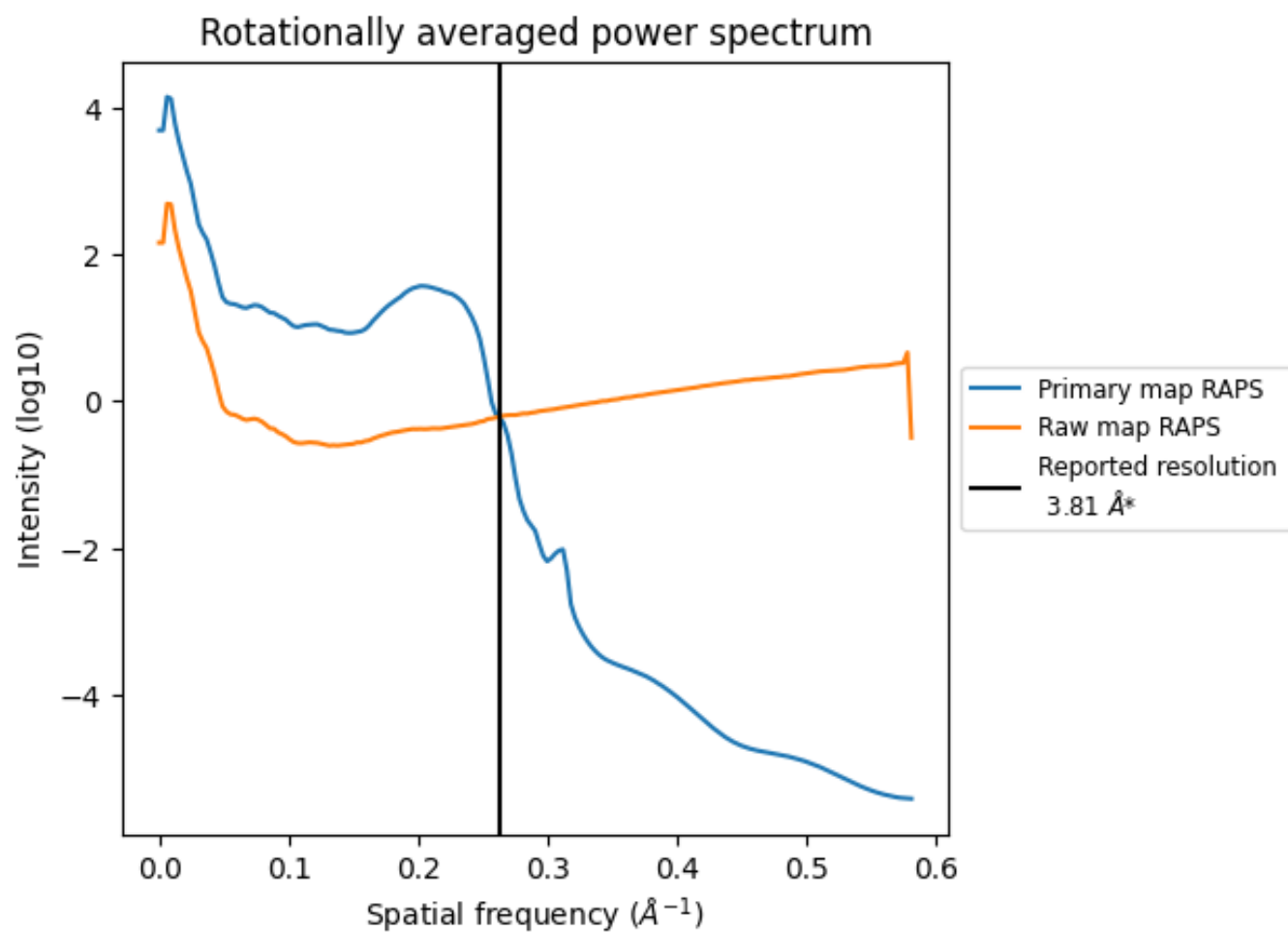
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 98 nm<sup>3</sup>; this corresponds to an approximate mass of 88 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 ⓘ

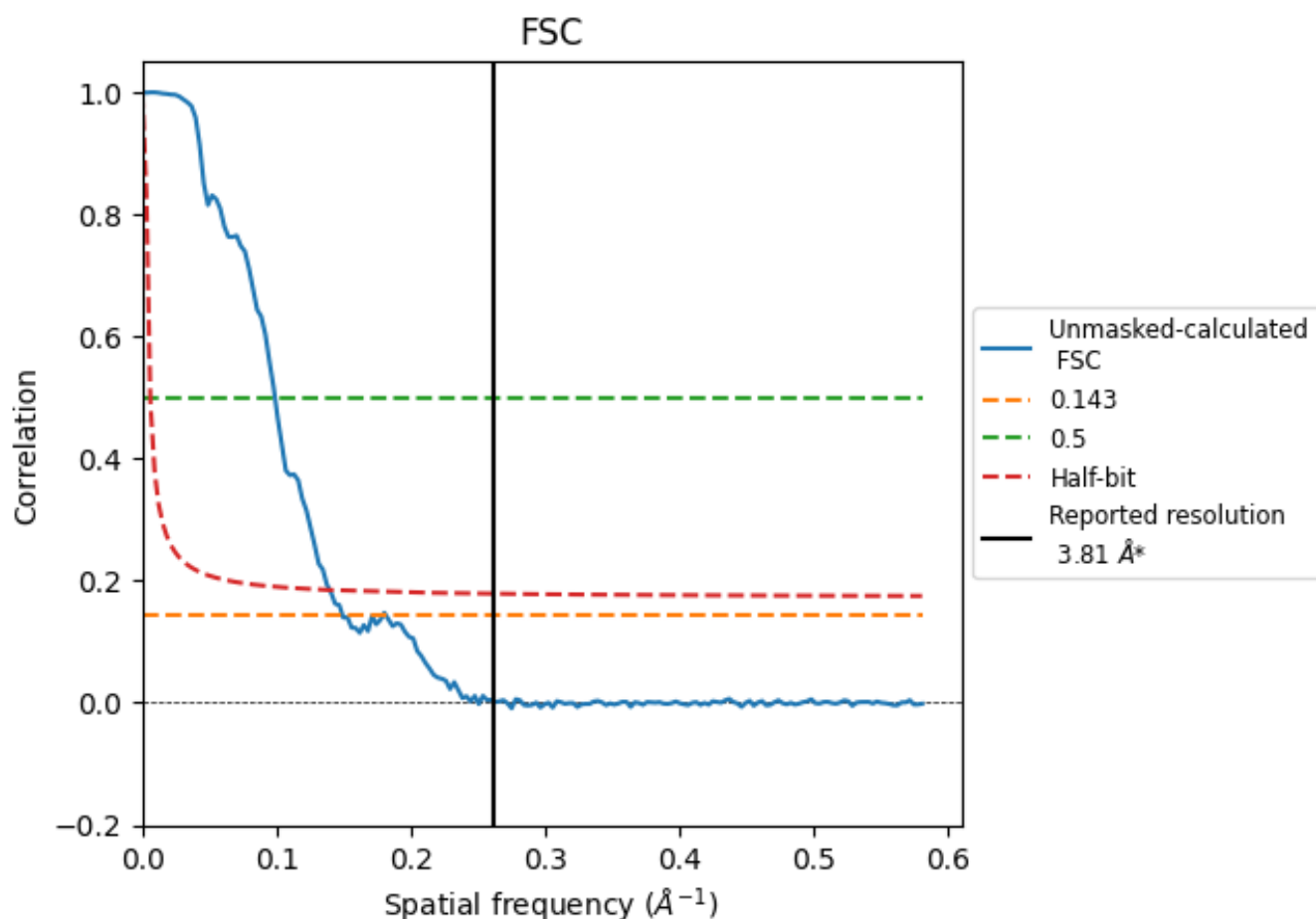


\*Reported resolution corresponds to spatial frequency of 0.262  $\text{\AA}^{-1}$

## 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 0.262 Å<sup>-1</sup>

## 8.2 Resolution estimates [i](#)

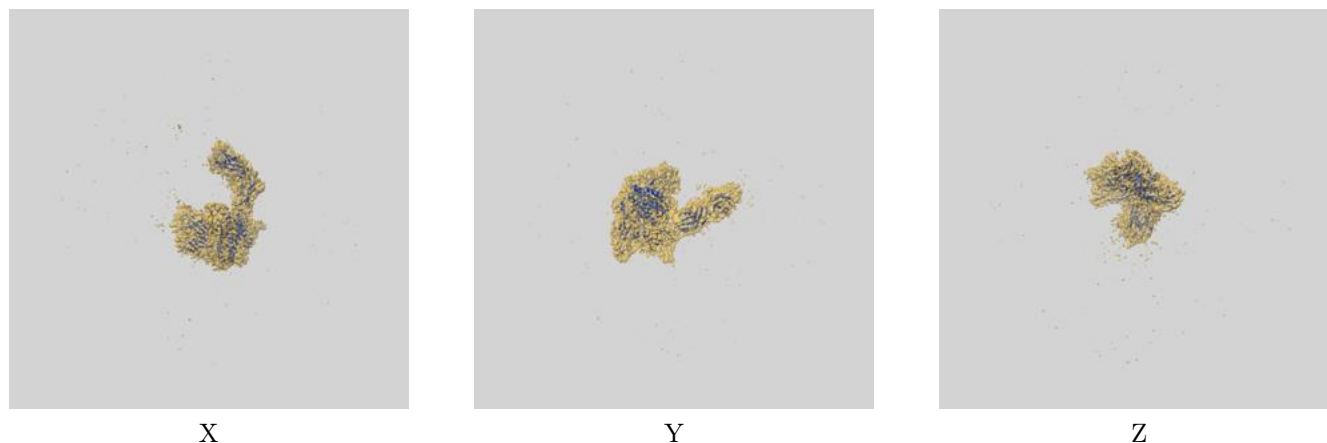
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.81	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	6.69	10.11	7.16

\*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 6.69 differs from the reported value 3.81 by more than 10 %

## 9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-27247 and PDB model 8D85. Per-residue inclusion information can be found in section [3](#) on page [7](#).

### 9.1 Map-model overlay [i](#)



The images above show the 3D surface view of the map at the recommended contour level 0.08 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.

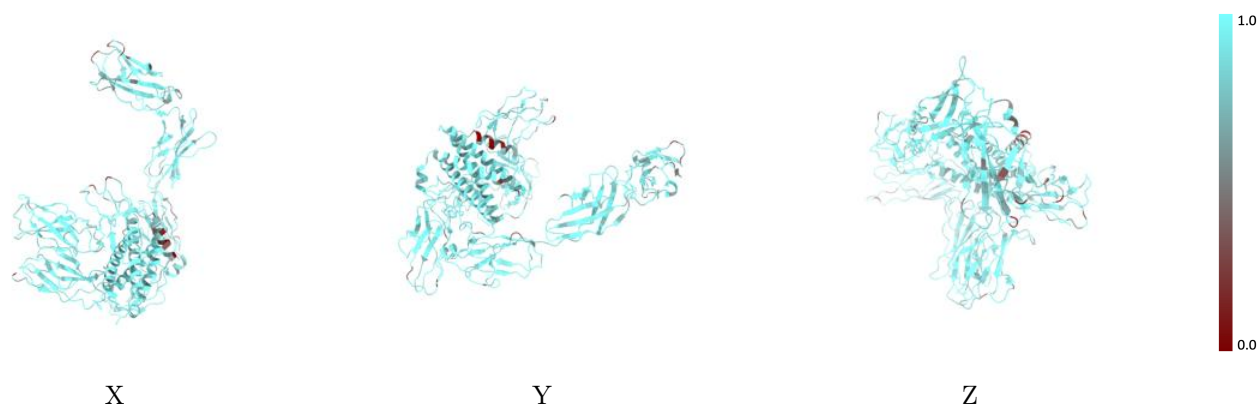


## 9.2 Q-score mapped to coordinate model [i](#)



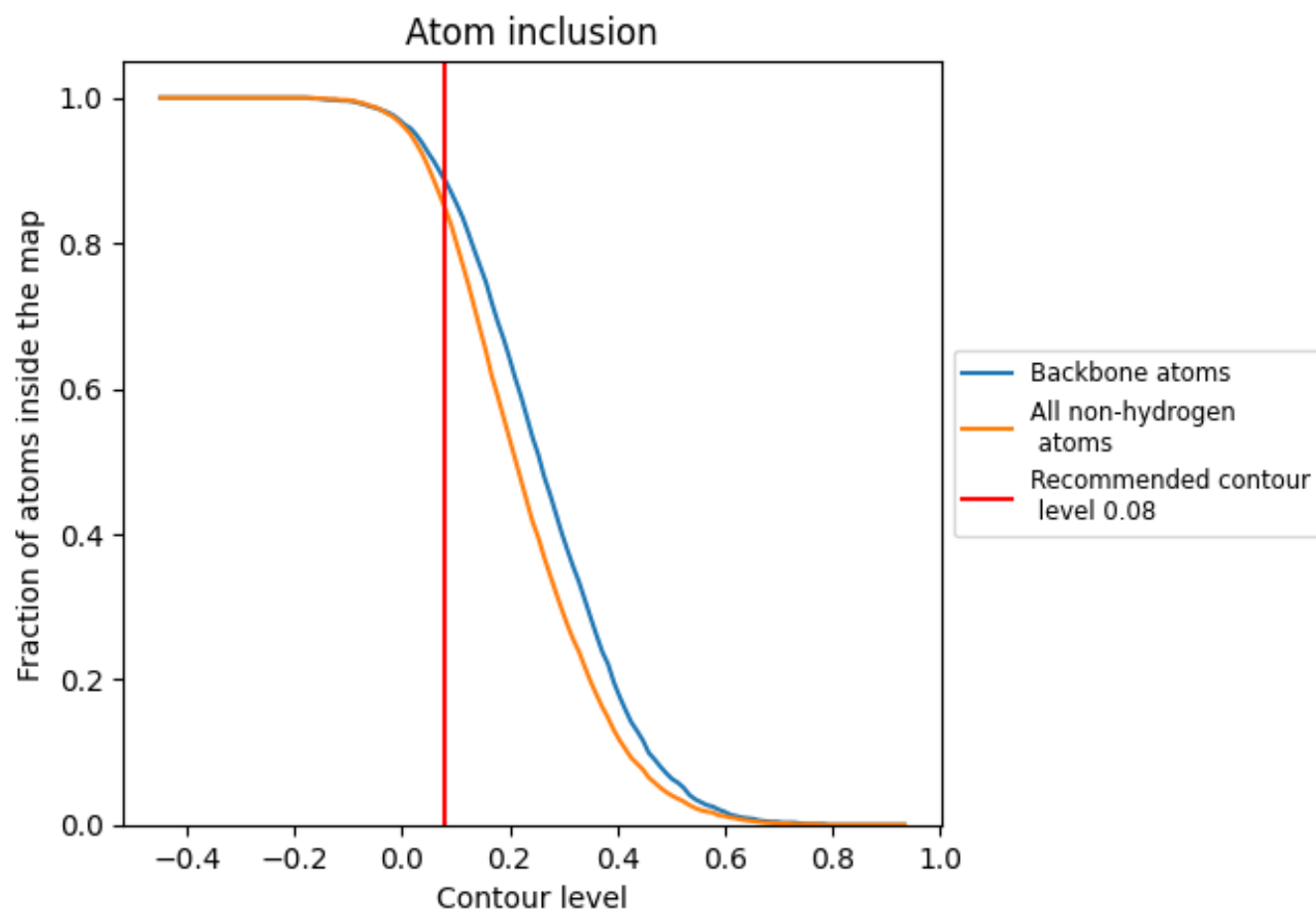
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.08).

## 9.4 Atom inclusion [i](#)



At the recommended contour level, 89% of all backbone atoms, 85% 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 (0.08) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	<div><div></div></div> 0.8480	<div><div></div></div> 0.3360
A	<div><div></div></div> 0.8580	<div><div></div></div> 0.3520
B	<div><div></div></div> 0.8380	<div><div></div></div> 0.3050
C	<div><div></div></div> 0.8880	<div><div></div></div> 0.3730
D	<div><div></div></div> 0.8250	<div><div></div></div> 0.3370
E	<div><div></div></div> 0.5000	<div><div></div></div> 0.1240
F	<div><div></div></div> 0.6070	<div><div></div></div> 0.1530
G	<div><div></div></div> 0.6430	<div><div></div></div> 0.2110

1.0

0.0

<0.0