



Full wwPDB EM Validation Report ⓘ

Dec 11, 2022 – 12:35 pm GMT

PDB ID : 6SD4
EMDB ID : EMD-10148
Title : Structure of the RBM3/collar region of the Salmonella flagella MS-ring protein
FliF with 34-fold symmetry applied
Authors : Johnson, S.; Fong, Y.H.; Deme, J.C.; Furlong, E.J.; Kuhlen, L.; Lea, S.M.
Deposited on : 2019-07-26
Resolution : 2.80 Å(reported)
Based on initial model : 6SCN

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:

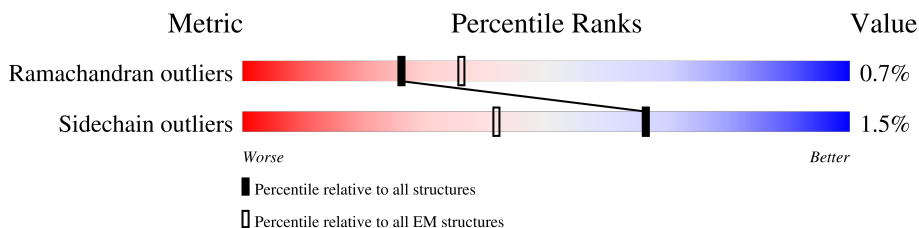
EMDB validation analysis : 0.0.1.dev43
MolProbity : 4.02b-467
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.9
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.31.3

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 2.80 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.










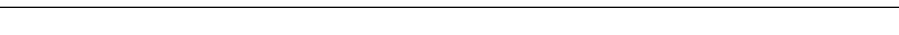
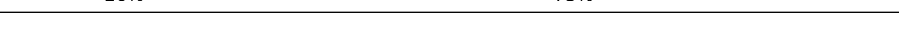
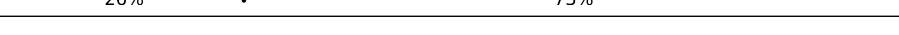
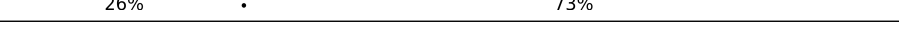
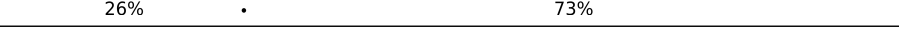













Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

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	560	26% . 73%
1	B	560	26% . 73%
1	C	560	26% . 73%
1	D	560	26% . 73%
1	E	560	26% . 73%
1	F	560	26% . 73%
1	G	560	26% . 73%
1	H	560	26% . 73%
1	I	560	26% . 73%

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Mol	Chain	Length	Quality of chain	
1	J	560		
1	K	560		
1	L	560		
1	M	560		
1	N	560		
1	O	560		
1	P	560		
1	Q	560		
1	R	560		
1	S	560		
1	T	560		
1	U	560		
1	V	560		
1	W	560		
1	X	560		
1	Y	560		
1	Z	560		
1	a	560		
1	b	560		
1	c	560		
1	d	560		
1	e	560		
1	f	560		
1	g	560		
1	h	560		

2 Entry composition [i](#)

There is only 1 type of molecule in this entry. The entry contains 40562 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 Flagellar M-ring protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	151	1193	726	223	241	3	0	0
1	B	151	1193	726	223	241	3	0	0
1	C	151	1193	726	223	241	3	0	0
1	D	151	1193	726	223	241	3	0	0
1	E	151	1193	726	223	241	3	0	0
1	F	151	1193	726	223	241	3	0	0
1	G	151	1193	726	223	241	3	0	0
1	H	151	1193	726	223	241	3	0	0
1	I	151	1193	726	223	241	3	0	0
1	J	151	1193	726	223	241	3	0	0
1	K	151	1193	726	223	241	3	0	0
1	L	151	1193	726	223	241	3	0	0
1	M	151	1193	726	223	241	3	0	0
1	N	151	1193	726	223	241	3	0	0
1	O	151	1193	726	223	241	3	0	0
1	P	151	1193	726	223	241	3	0	0
1	Q	151	1193	726	223	241	3	0	0

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Mol	Chain	Residues	Atoms					AltConf	Trace
1	R	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	S	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	T	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	U	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	V	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	W	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	X	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	Y	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	Z	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	a	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	b	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	c	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	d	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	e	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	f	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	g	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	h	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		

GLU	PRO	GLY	ARG	ALA	LEU	ASP	GLY	GLN	LEU	ILE	SER	ALA	VAL	VAL	HIS	LEU	SER	SER	ALA	THR	LEU	VAL	GLN	GLY	ASP	LEU	R251	I256	V304	GLY	ALA	GLY	TYR	PRO				
GLY	VAL	PRO	ALA	GLY	LEU	SER	ASN	GLN	PRO	ALA	PRO	PRO	ASN	ALA	THR	GLN	ALA	ILE	ALA	THR	GLN	PRO	GLN	ASN	ALA	P355	D369	K394	THR	LEU	ALA	ASP	GLY	LYS	PRO	L402	K425	
S438	ALA	VAL	ASP	ASN	THR	GLY	GLY	LEU	LEU	PRO	PHE	TRP	GLN	ARG	LEU	SER	ASN	PHE	ILE	THR	ASP	GLU	ASP	GLY	ARG	ARG	ARG	THR	VAL	VAL	GLU	GLU	ALA	LYS	ALA	ALA	GLN	GLU
GLN	ALA	GLN	VAL	ARG	GLN	THR	GLY	GLU	VAL	VAL	ARG	GLN	GLN	LEU	SER	LYS	ASP	GLU	GLN	ASP	GLY	ALA	ARG	ALA	ALA	GLY	VAL	VAL	ALA	ALA	VAL	LEU	LEU	ILE	ARG	GLN	THR	SER
ASN	ASP	HIS	GLU																																			

• Molecule 1: Flagellar M-ring protein



MET	SER	ALA	THR	SER	THR	SER	THR	ALA	THR	GLN	LYS	PRO	PRO	LEU	TRP	LEU	ASN	ARG	LEU	LEU	ARG	ALA	ALA	GLY	VAL	GLY	LEU	VAL	VAL	GLN	ARG	LEU	ASP	TRP	ALA	ASP	ALA	ASP		
GLN	ASP	GLY	ILE	ALA	GLN	ILE	VAL	ALA	GLN	GLN	MET	ASN	ASN	ILE	PRO	TYR	GLY	PHE	ALA	ALA	LEU	ALA	ASN	GLY	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	LYS	
PHE	GLY	ILE	SER	GLN	PHE	SER	GLY	GLU	GLN	ASN	ARG	ARG	ALA	ALA	LEU	GLY	GLU	THR	ILE	THR	LEU	ALA	ALA	GLY	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	LYS	
GLU	PRO	GLY	ARG	ALA	LEU	ASP	GLY	GLY	GLN	ILE	SER	ALA	HIS	LEU	VAL	SER	THR	GLY	HIS	LEU	LEU	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	PRO	
GLY	VAL	PRO	ALA	GLY	LEU	SER	ASN	GLN	PRO	ALA	PRO	PRO	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR
S436	ALA	VAL	ASP	ASN	THR	GLY	GLY	LEU	LEU	PRO	PHE	TRP	GLN	ARG	LEU	GLY	GLU	THR	ILE	THR	ASN	ARG	ALA	ALA	GLY	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	GLU
GLN	ALA	VAL	ARG	GLN	THR	GLY	GLY	GLU	VAL	VAL	ARG	VAL	ARG	LEU	SER	LYS	ASP	GLU	GLN	GLN	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	SER	
ASN	ASP	HIS	GLU																																					

• Molecule 1: Flagellar M-ring protein



MET	SER	ALA	THR	SER	THR	SER	THR	ALA	THR	GLN	LYS	PRO	PRO	LEU	TRP	LEU	ASN	ARG	LEU	LEU	ARG	ALA	ALA	GLY	VAL	GLY	LEU	VAL	VAL	GLN	ARG	LEU	ASP	TRP	ALA	ASP	ALA	ASP			
GLN	ASP	GLY	ILE	ALA	GLN	ILE	VAL	ALA	GLN	GLN	MET	ASN	ASN	ILE	PRO	TYR	GLY	PHE	ALA	ALA	LEU	ALA	ASN	GLY	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	LYS	
PHE	GLY	ILE	SER	GLN	PHE	SER	GLY	GLU	GLN	ASN	ARG	ARG	ALA	ALA	LEU	GLY	GLU	THR	ILE	THR	LEU	ALA	ALA	GLY	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	LEU

GLU	PRO	GLY	ARG	ALA	LEU	ASP	GLY	GLU	GLN	ILE	SER	ALA	VAL	VAL	HIS	LEU	SER	SER	ALA	THR	ALA	VAL	GLN	PRO	LEU	GLY	GLN	GLY	GLY	ASP	LEU	R231	I256	V304	GLY	ALA	GLY	TYR	PRO		
GLY	VAL	PRO	GLY	ALA	LEU	SER	ASN	GLN	PRO	ALA	PRO	PRO	ASN	ALA	THR	ASN	GLN	ALA	THR	GLN	GLN	ASP	THR	GLN	GLN	GLY	P355	D369	K394	THR	LEU	ALA	ASP	GLY	LYS	PRO	L402	K425			
S438	ALA	VAL	ASP	ASN	THR	GLY	GLY	LEU	LEU	PHE	TRP	GLN	GLN	SER	PHE	ILE	ASP	GLU	ASP	GLN	LEU	TRP	ALA	GLY	GLY	TRP	ALA	VAL	ARG	ARG	VAL	VAL	GLU	GLU	ALA	LYS	ALA	ALA	GLN	GLU	
GLN	ALA	GLN	VAL	ARG	GLN	THR	ALA	VAL	VAL	ARG	GLN	LEU	SER	LYS	ASP	ILE	GLU	GLU	GLN	LEU	ARG	ALA	ALA	ALA	GLY	TRP	ALA	GLN	TRP	ALA	VAL	VAL	GLU	VAL	ILE	ARG	GLN	THR	GLN	SER	
ASN	ASP	HIS	GLU																																						

• Molecule 1: Flagellar M-ring protein



MET	SER	ALA	THR	ALA	SER	THR	ALA	THR	GLN	PRO	LYS	PRO	LEU	ASN	ARG	LEU	ARG	GLU	ALA	ASN	ARG	ALA	PRO	ILE	GLY	GLY	ALA	VAL	VAL	THR	ALA	ASP	VAL	TTR	ARG	VAL	THR	THR	PHE	ASN	LEU	SER	ASP	
GLN	ASP	GLY	THR	ALA	ILE	VAL	ALA	GLN	GLN	THR	TYR	MET	ASN	ILE	TYR	PHE	ALA	LEU	ALA	ASN	ARG	ALA	ILE	GLU	VAL	VAL	GLY	HIS	VAL	GLN	PRO	GLN	GLY	ALA	VAL	GLY	PHE	PRO	SER	LEU	GLN	GLU	LYS	
PHE	GLY	ILE	SER	GLN	PHE	SER	GLU	GLN	VAL	ASN	TYR	GLN	ARG	ALA	GLY	LEU	LEU	LEU	THR	ILE	ALA	THR	THR	GLY	GLY	VAL	ARG	ALA	MET	ARG	VAL	LYS	PRO	LYS	SER	PHE	VAL	PRO	SER	ALA	THR	VAL	THR	LEU
GLU	PRO	ARG	LEU	ASP	GLY	GLY	GLN	ILE	ALA	VAL	HIS	VAL	VAL	VAL	SER	SER	LEU	PRO	PRO	GLY	THR	LEU	VAL	VAL	GLY	HIS	LEU	THR	THR	THR	ASN	THR	R231	I256	V304	GLY	ALA	GLY	TYR	PRO				
GLY	VAL	PRO	GLY	ALA	SER	LEU	ASN	PRO	ALA	PRO	ALA	PRO	PRO	ASN	ILE	ALA	THR	GLN	ASN	GLN	THR	PRO	ASN	THR	THR	SER	THR	ASN	GLY	P355	D369	K394	THR	LEU	ALA	ASP	GLY	LYS	PRO	L402	K425			
S438	ALA	VAL	ASP	ASN	THR	GLY	GLY	LEU	LEU	PHE	TRP	GLN	GLN	SER	PHE	ILE	ASP	GLU	ASP	GLN	LEU	TRP	ALA	GLY	GLY	TRP	ALA	VAL	ARG	ARG	VAL	VAL	GLU	GLU	ALA	LYS	ALA	ALA	GLN	GLU	GLU			
GLN	ALA	GLN	VAL	ARG	GLN	THR	ALA	VAL	VAL	ARG	GLN	LEU	SER	LYS	ASP	ILE	GLU	GLU	GLN	LEU	ARG	ALA	ALA	ALA	GLY	TRP	ALA	GLN	TRP	ALA	VAL	VAL	GLU	VAL	ILE	ARG	GLN	THR	GLN	GLU	MET	SER		
ASN	ASP	HIS	GLU																																									

• Molecule 1: Flagellar M-ring protein



MET	SER	ALA	THR	ALA	SER	THR	ALA	THR	GLN	PRO	LYS	PRO	LEU	ASN	ARG	LEU	ARG	GLU	ALA	ASN	ARG	ALA	PRO	ILE	GLY	GLY	ALA	VAL	VAL	THR	ALA	ASP	VAL	TTR	ARG	VAL	THR	THR	PHE	ASN	LEU	SER	ASP
GLN	ASP	GLY	THR	ALA	ILE	VAL	ALA	GLN	GLN	THR	TYR	MET	ASN	ILE	TYR	PHE	ALA	LEU	ALA	ASN	ARG	ALA	ILE	GLU	VAL	VAL	GLY	HIS	VAL	GLN	PRO	GLN	GLY	ALA	VAL	GLY	PHE	PRO	SER	LEU	GLN	GLU	LYS
PHE	GLY	ILE	SER	GLN	PHE	SER	GLU	GLN	VAL	ASN	TYR	GLN	ARG	ALA	GLY	LEU	LEU	LEU	THR	ILE	ALA	THR	THR	GLY	VAL	ARG	ALA	MET	ARG	VAL	LYS	PRO	LYS	SER	PHE	VAL	PRO	SER	ALA	THR	VAL	THR	LEU
GLU	PRO	ARG	LEU	ASP	GLY	GLY	GLN	ILE	ALA	VAL	HIS	VAL	VAL	VAL	SER	SER	LEU	PRO	PRO	GLY	THR	LEU	VAL	VAL	GLY	HIS	LEU	THR	THR	THR	ASN	THR	R231	I256	V304	GLY	ALA	GLY	TYR	PRO			
GLY	VAL	PRO	GLY	ALA	SER	LEU	ASN	PRO	ALA	PRO	ALA	PRO	PRO	ASN	ILE	ALA	THR	GLN	ASN	GLN	THR	PRO	ASN	THR	THR	SER	THR	ASN	GLY	P355	D369	K394	THR	LEU	ALA	ASP	GLY	LYS	PRO	L402	K425		
S438	ALA	VAL	ASP	ASN	THR	GLY	GLY	LEU	LEU	PHE	TRP	GLN	GLN	SER	PHE	ILE	ASP	GLU	ASP	GLN	LEU	TRP	ALA	GLY	GLY	TRP	ALA	VAL	ARG	ARG	VAL	VAL	GLU	GLU	ALA	LYS	ALA	ALA	GLN	GLU	GLU		
GLN	ALA	GLN	VAL	ARG	GLN	THR	ALA	VAL	VAL	ARG	GLN	LEU	SER	LYS	ASP	ILE	GLU	GLU	GLN	LEU	ARG	ALA	ALA	ALA	GLY	TRP	ALA	GLN	TRP	ALA	VAL	VAL	GLU	VAL	ILE	ARG	GLN	THR	GLN	GLU	MET	SER	
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GLN
ILE
ALA
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VAL
ASN
LEU
PRO
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THR
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ASP
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ASN
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GLU

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C34	Depositor
Number of particles used	140606	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 ($e^-/\text{\AA}^2$)	48	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K2 QUANTUM (4k x 4k)	Depositor
Maximum map value	0.094	Depositor
Minimum map value	-0.051	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.002	Depositor
Recommended contour level	0.01	Depositor
Map size (Å)	355.104, 355.104, 355.104	wwPDB
Map dimensions	432, 432, 432	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.822, 0.822, 0.822	Depositor

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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	0.47	0/1205	0.47	0/1624
1	B	0.47	0/1205	0.47	0/1624
1	C	0.47	0/1205	0.47	0/1624
1	D	0.47	0/1205	0.47	0/1624
1	E	0.47	0/1205	0.47	0/1624
1	F	0.47	0/1205	0.47	0/1624
1	G	0.47	0/1205	0.47	0/1624
1	H	0.46	0/1205	0.47	0/1624
1	I	0.47	0/1205	0.47	0/1624
1	J	0.47	0/1205	0.47	0/1624
1	K	0.47	0/1205	0.47	0/1624
1	L	0.47	0/1205	0.47	0/1624
1	M	0.47	0/1205	0.47	0/1624
1	N	0.47	0/1205	0.47	0/1624
1	O	0.47	0/1205	0.47	0/1624
1	P	0.47	0/1205	0.47	0/1624
1	Q	0.47	0/1205	0.47	0/1624
1	R	0.47	0/1205	0.47	0/1624
1	S	0.47	0/1205	0.47	0/1624
1	T	0.47	0/1205	0.47	0/1624
1	U	0.47	0/1205	0.47	0/1624
1	V	0.47	0/1205	0.47	0/1624
1	W	0.47	0/1205	0.47	0/1624
1	X	0.47	0/1205	0.47	0/1624
1	Y	0.47	0/1205	0.47	0/1624
1	Z	0.47	0/1205	0.47	0/1624
1	a	0.46	0/1205	0.47	0/1624
1	b	0.47	0/1205	0.47	0/1624
1	c	0.47	0/1205	0.47	0/1624
1	d	0.47	0/1205	0.47	0/1624
1	e	0.47	0/1205	0.47	0/1624
1	f	0.47	0/1205	0.47	0/1624
1	g	0.47	0/1205	0.47	0/1624
1	h	0.47	0/1205	0.47	0/1624

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
All	All	0.47	0/40970	0.47	0/55216

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](#)

Due to software issues we are unable to calculate clashes - this section is therefore empty.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all 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	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	B	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	C	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	D	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	E	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	F	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	G	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	H	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	I	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	J	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	K	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	L	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	M	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	N	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	O	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	P	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	Q	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	R	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	S	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	T	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	U	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	V	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	W	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	X	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	Y	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	Z	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	a	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	b	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	c	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	d	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	e	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	f	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	g	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	h	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
All	All	4930/19040 (26%)	4420 (90%)	476 (10%)	34 (1%)	26	53

All (34) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	256	ILE
1	B	256	ILE
1	C	256	ILE
1	D	256	ILE
1	E	256	ILE
1	F	256	ILE
1	G	256	ILE

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Mol	Chain	Res	Type
1	H	256	ILE
1	I	256	ILE
1	J	256	ILE
1	K	256	ILE
1	L	256	ILE
1	M	256	ILE
1	N	256	ILE
1	O	256	ILE
1	P	256	ILE
1	Q	256	ILE
1	R	256	ILE
1	S	256	ILE
1	T	256	ILE
1	U	256	ILE
1	V	256	ILE
1	W	256	ILE
1	X	256	ILE
1	Y	256	ILE
1	Z	256	ILE
1	a	256	ILE
1	b	256	ILE
1	c	256	ILE
1	d	256	ILE
1	e	256	ILE
1	f	256	ILE
1	g	256	ILE
1	h	256	ILE

5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all 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	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	B	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	C	134/467 (29%)	132 (98%)	2 (2%)	65	89

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	D	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	E	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	F	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	G	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	H	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	I	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	J	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	K	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	L	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	M	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	N	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	O	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	P	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	Q	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	R	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	S	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	T	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	U	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	V	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	W	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	X	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	Y	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	Z	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	a	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	b	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	c	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	d	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	e	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	f	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	g	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	h	134/467 (29%)	132 (98%)	2 (2%)	65	89

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
All	All	4556/15878 (29%)	4488 (98%)	68 (2%)	66 89

All (68) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	369	ASP
1	A	425	LYS
1	B	369	ASP
1	B	425	LYS
1	C	369	ASP
1	C	425	LYS
1	D	369	ASP
1	D	425	LYS
1	E	369	ASP
1	E	425	LYS
1	F	369	ASP
1	F	425	LYS
1	G	369	ASP
1	G	425	LYS
1	H	369	ASP
1	H	425	LYS
1	I	369	ASP
1	I	425	LYS
1	J	369	ASP
1	J	425	LYS
1	K	369	ASP
1	K	425	LYS
1	L	369	ASP
1	L	425	LYS
1	M	369	ASP
1	M	425	LYS
1	N	369	ASP
1	N	425	LYS
1	O	369	ASP
1	O	425	LYS
1	P	369	ASP
1	P	425	LYS
1	Q	369	ASP
1	Q	425	LYS
1	R	369	ASP
1	R	425	LYS
1	S	369	ASP

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Mol	Chain	Res	Type
1	S	425	LYS
1	T	369	ASP
1	T	425	LYS
1	U	369	ASP
1	U	425	LYS
1	V	369	ASP
1	V	425	LYS
1	W	369	ASP
1	W	425	LYS
1	X	369	ASP
1	X	425	LYS
1	Y	369	ASP
1	Y	425	LYS
1	Z	369	ASP
1	Z	425	LYS
1	a	369	ASP
1	a	425	LYS
1	b	369	ASP
1	b	425	LYS
1	c	369	ASP
1	c	425	LYS
1	d	369	ASP
1	d	425	LYS
1	e	369	ASP
1	e	425	LYS
1	f	369	ASP
1	f	425	LYS
1	g	369	ASP
1	g	425	LYS
1	h	369	ASP
1	h	425	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (111) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	263	HIS
1	A	277	GLN
1	A	434	ASN
1	B	263	HIS
1	B	277	GLN
1	B	365	ASN
1	B	434	ASN

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Mol	Chain	Res	Type
1	C	263	HIS
1	C	277	GLN
1	C	434	ASN
1	D	263	HIS
1	D	277	GLN
1	D	434	ASN
1	E	263	HIS
1	E	434	ASN
1	F	263	HIS
1	F	365	ASN
1	F	434	ASN
1	G	263	HIS
1	G	277	GLN
1	G	365	ASN
1	G	434	ASN
1	H	263	HIS
1	H	434	ASN
1	I	263	HIS
1	I	277	GLN
1	I	365	ASN
1	I	434	ASN
1	J	263	HIS
1	J	277	GLN
1	J	365	ASN
1	J	434	ASN
1	K	263	HIS
1	K	277	GLN
1	K	365	ASN
1	K	434	ASN
1	L	263	HIS
1	L	277	GLN
1	L	434	ASN
1	M	263	HIS
1	M	277	GLN
1	M	365	ASN
1	M	434	ASN
1	N	263	HIS
1	N	277	GLN
1	N	365	ASN
1	N	434	ASN
1	O	263	HIS
1	O	434	ASN

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Mol	Chain	Res	Type
1	P	263	HIS
1	P	434	ASN
1	Q	263	HIS
1	Q	277	GLN
1	Q	365	ASN
1	Q	434	ASN
1	R	263	HIS
1	R	365	ASN
1	R	434	ASN
1	S	263	HIS
1	S	277	GLN
1	S	434	ASN
1	T	263	HIS
1	T	277	GLN
1	T	434	ASN
1	U	263	HIS
1	U	277	GLN
1	U	365	ASN
1	U	434	ASN
1	V	263	HIS
1	V	277	GLN
1	V	434	ASN
1	W	263	HIS
1	W	277	GLN
1	W	434	ASN
1	X	263	HIS
1	X	365	ASN
1	X	434	ASN
1	Y	263	HIS
1	Y	277	GLN
1	Y	365	ASN
1	Y	434	ASN
1	Z	263	HIS
1	Z	365	ASN
1	Z	411	GLN
1	Z	434	ASN
1	a	263	HIS
1	a	431	ASN
1	a	434	ASN
1	b	263	HIS
1	b	277	GLN
1	b	365	ASN

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Mol	Chain	Res	Type
1	b	434	ASN
1	c	263	HIS
1	c	277	GLN
1	c	365	ASN
1	c	434	ASN
1	d	263	HIS
1	d	277	GLN
1	d	365	ASN
1	d	434	ASN
1	e	263	HIS
1	e	277	GLN
1	e	434	ASN
1	f	263	HIS
1	f	434	ASN
1	g	263	HIS
1	g	277	GLN
1	g	365	ASN
1	g	434	ASN
1	h	263	HIS
1	h	434	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

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.

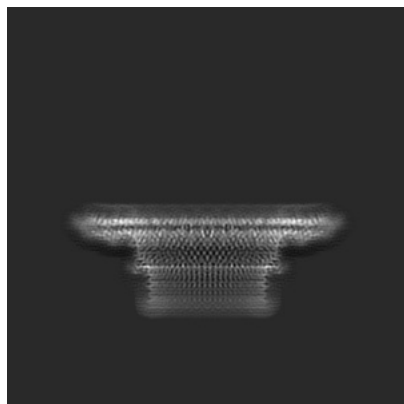
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-10148. These allow visual inspection of the internal detail of the map and identification of artifacts.

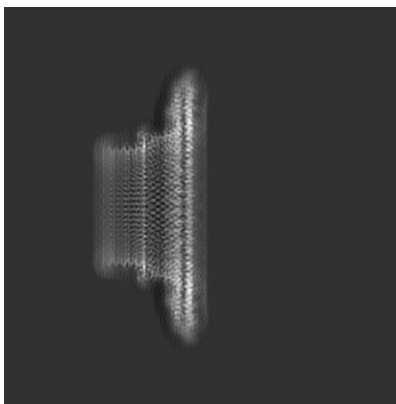
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

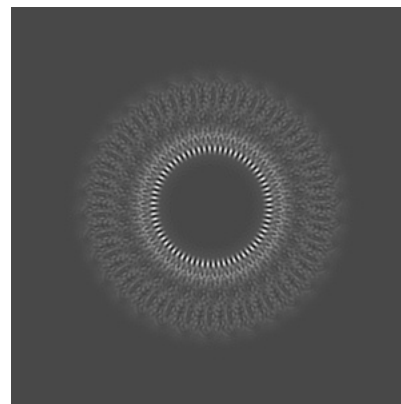
6.1.1 Primary map



X

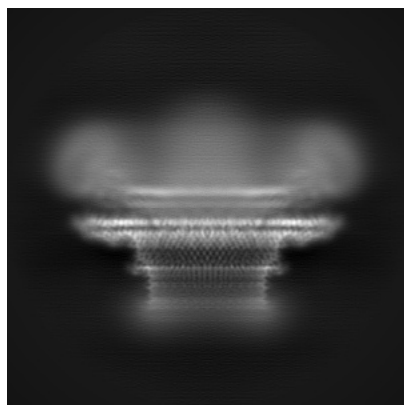


Y

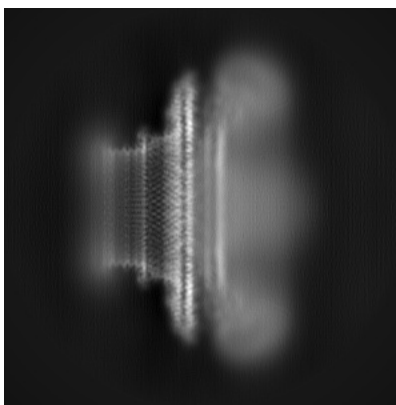


Z

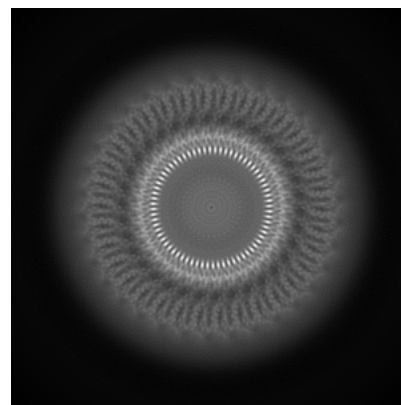
6.1.2 Raw map



X



Y



Z

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

6.2 Central slices [i](#)

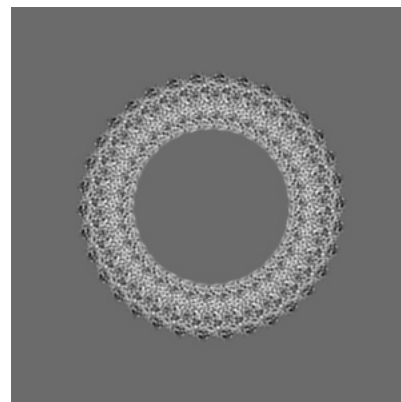
6.2.1 Primary map



X Index: 216

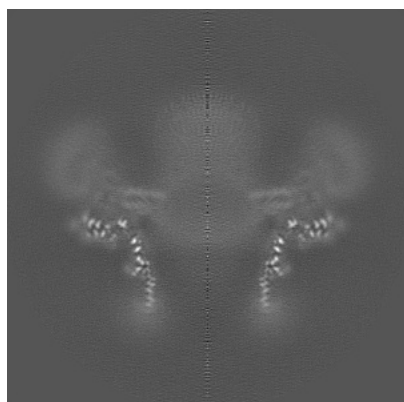


Y Index: 216

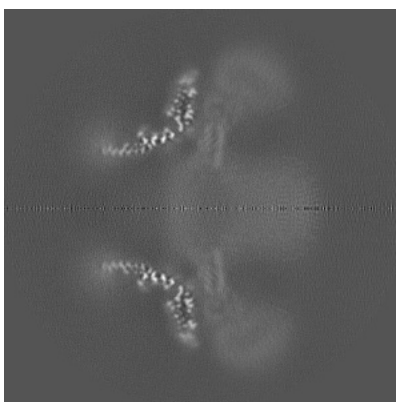


Z Index: 216

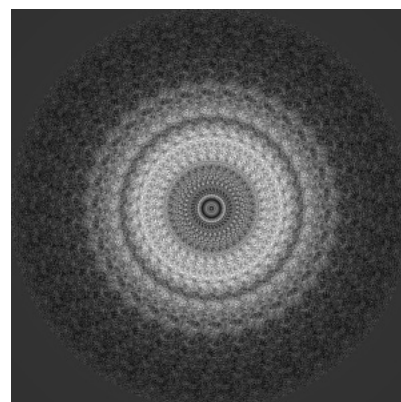
6.2.2 Raw map



X Index: 216



Y Index: 216



Z Index: 216

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

6.3 Largest variance slices [i](#)

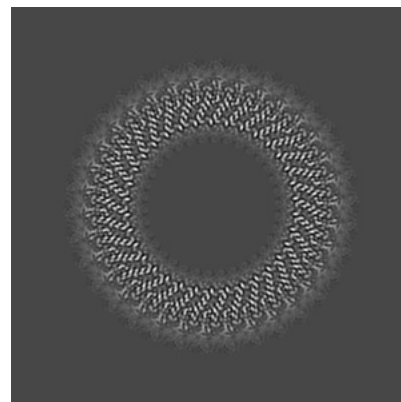
6.3.1 Primary map



X Index: 155

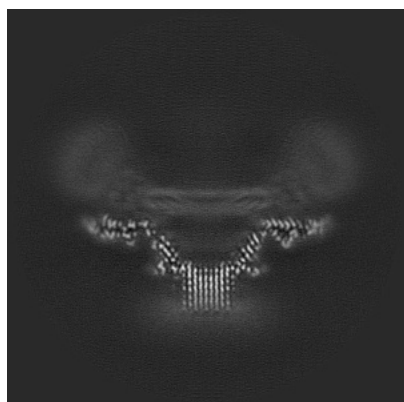


Y Index: 155

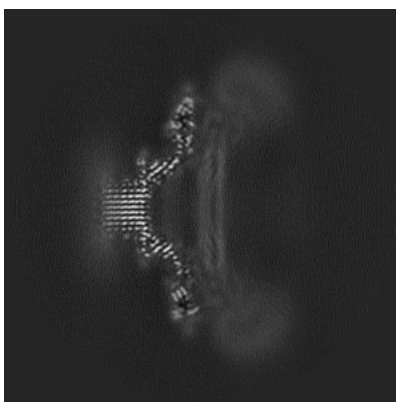


Z Index: 198

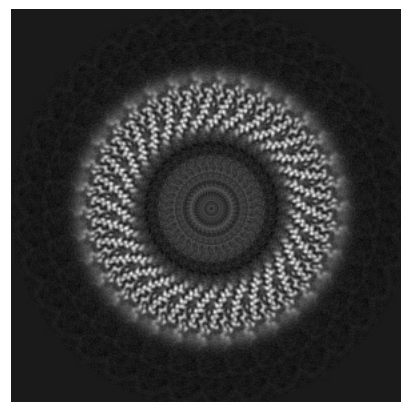
6.3.2 Raw map



X Index: 155



Y Index: 154

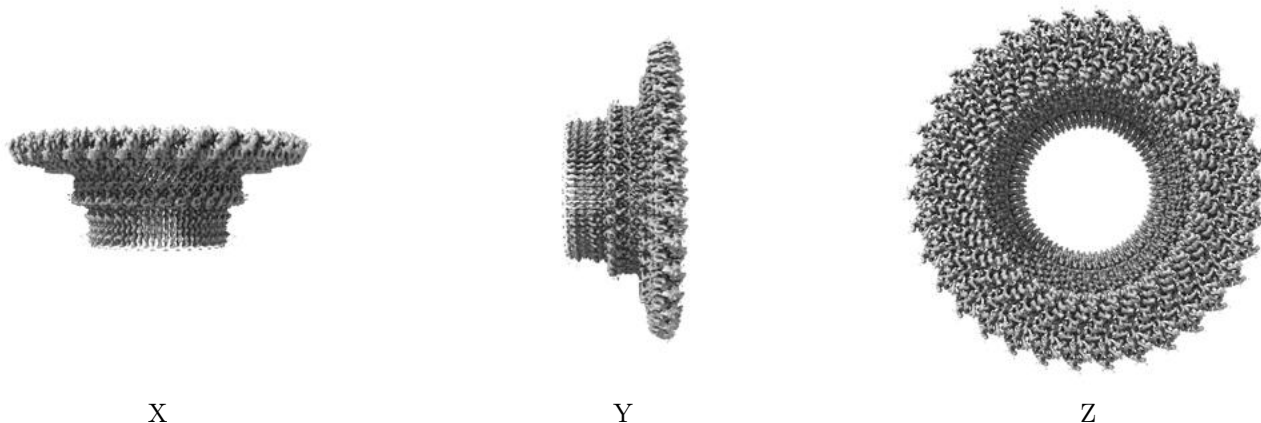


Z Index: 200

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

6.4 Orthogonal surface views [i](#)

6.4.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.01. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.4.2 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.

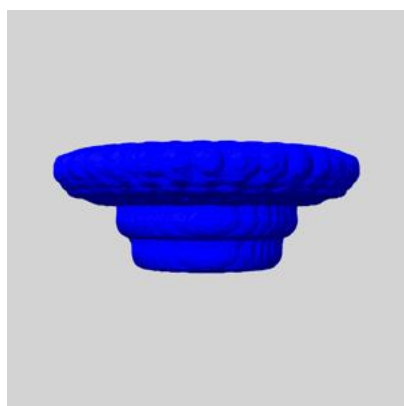
6.5 Mask visualisation [i](#)

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

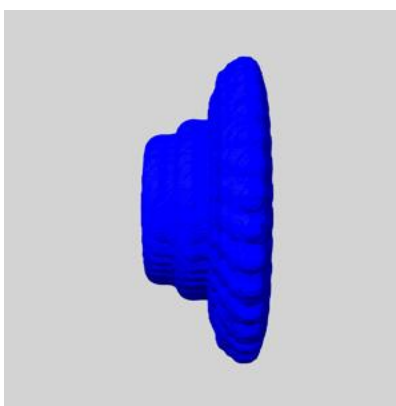
A mask typically either:

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

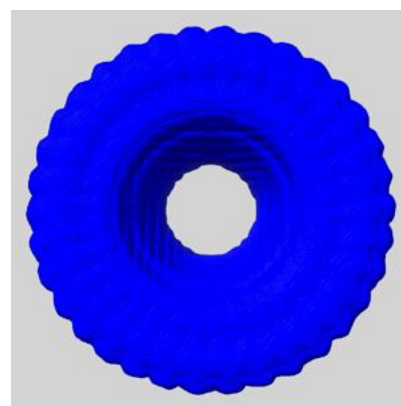
6.5.1 emd_10148_msk_1.map [i](#)



X



Y

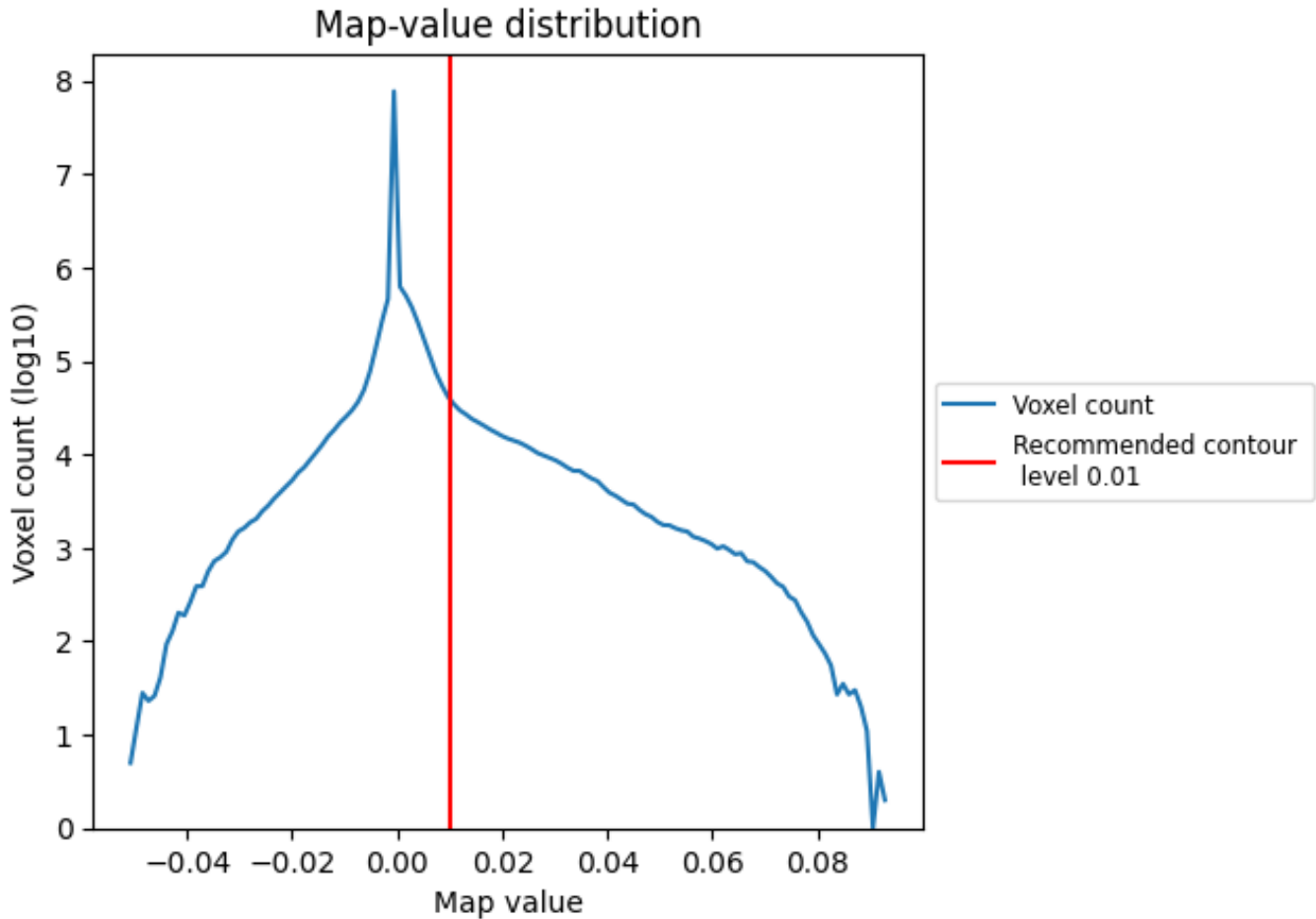


Z

7 Map analysis [i](#)

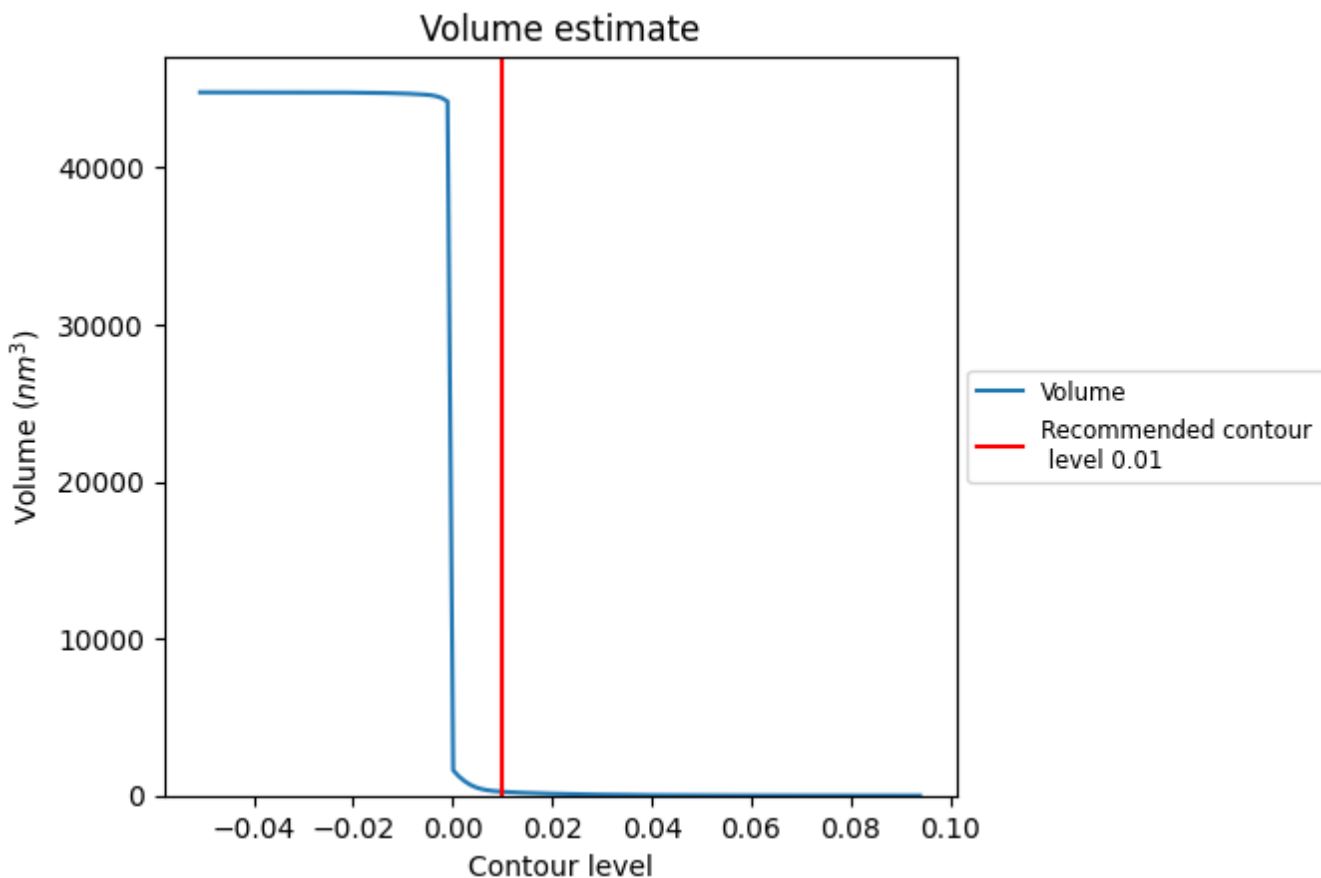
This section contains the results of statistical analysis of the map.

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.

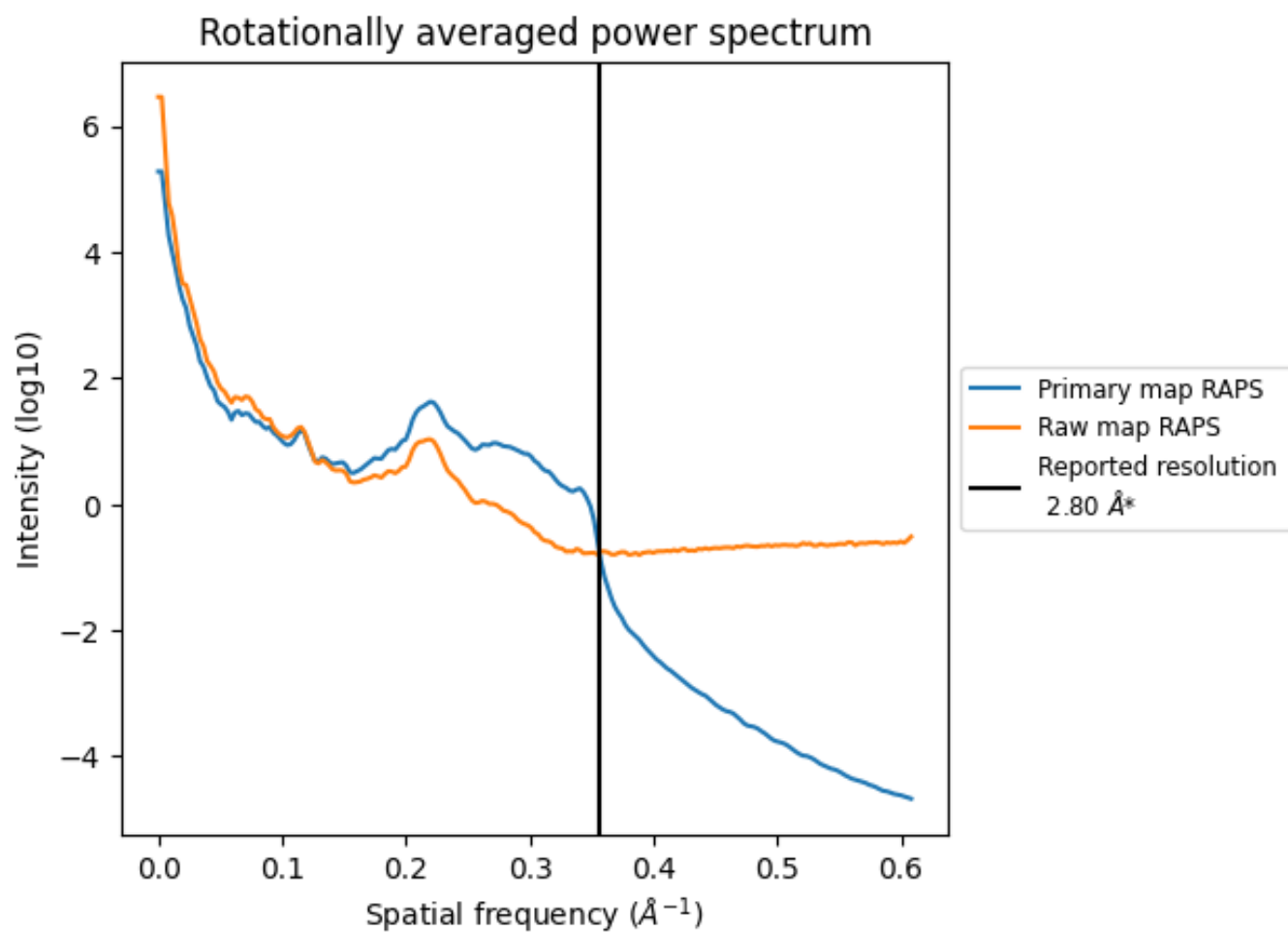
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 244 nm³; this corresponds to an approximate mass of 220 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 i

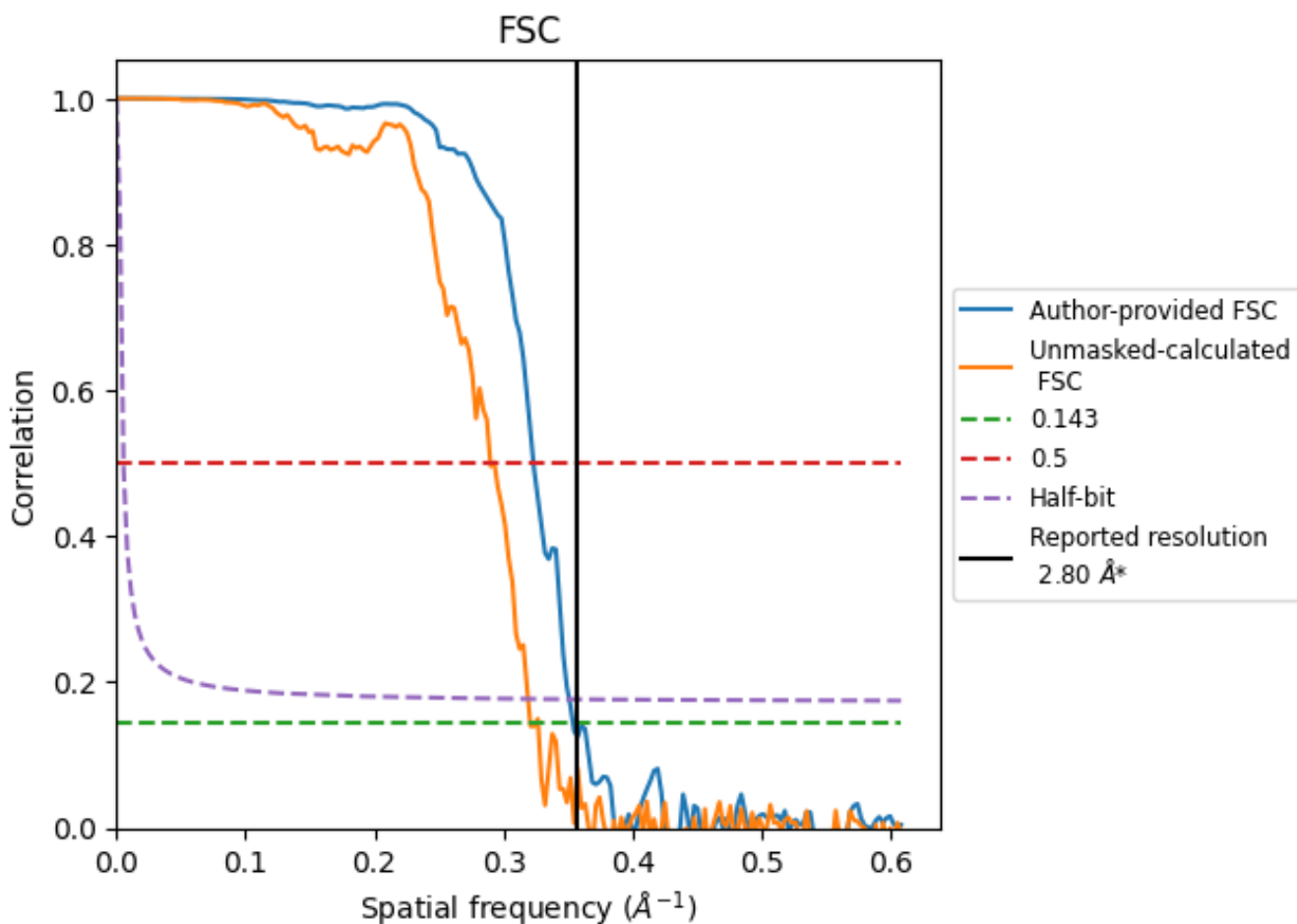


*Reported resolution corresponds to spatial frequency of 0.357 Å⁻¹

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 0.357 Å⁻¹

8.2 Resolution estimates [i](#)

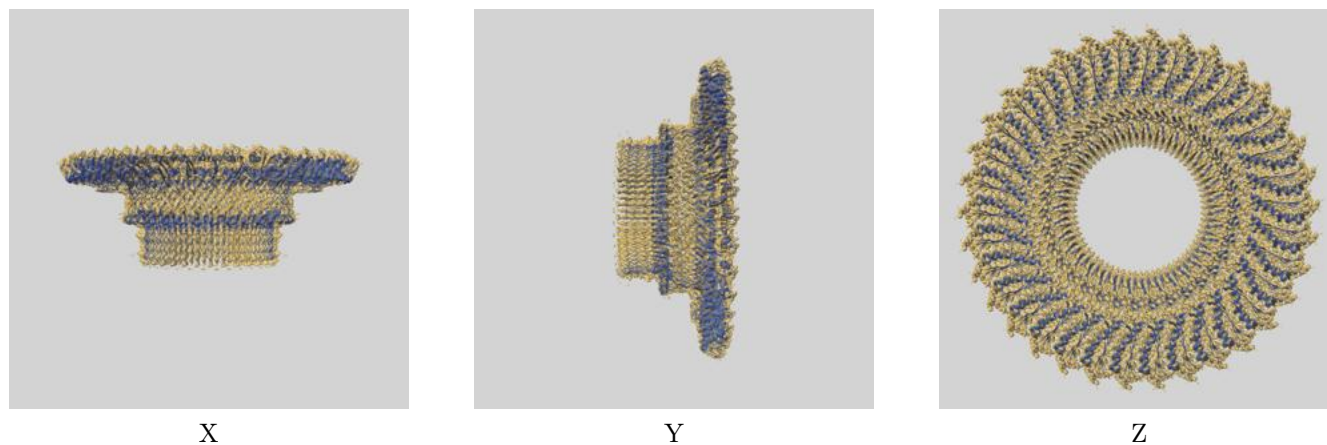
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.80	-	-
Author-provided FSC curve	2.82	3.09	2.85
Unmasked-calculated*	3.12	3.45	3.13

*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 3.12 differs from the reported value 2.8 by more than 10 %

9 Map-model fit [i](#)

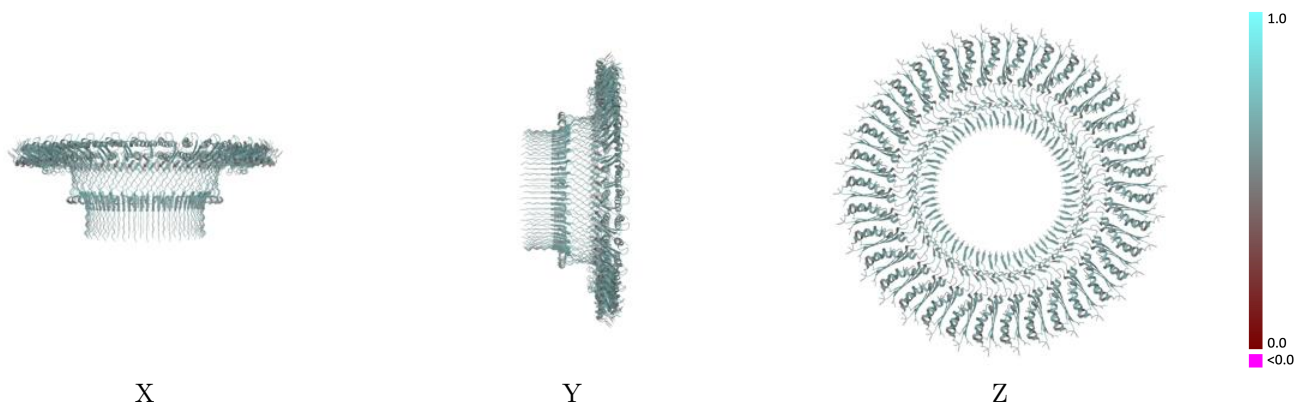
This section contains information regarding the fit between EMDB map EMD-10148 and PDB model 6SD4. Per-residue inclusion information can be found in section 3 on page 6.

9.1 Map-model overlay [i](#)



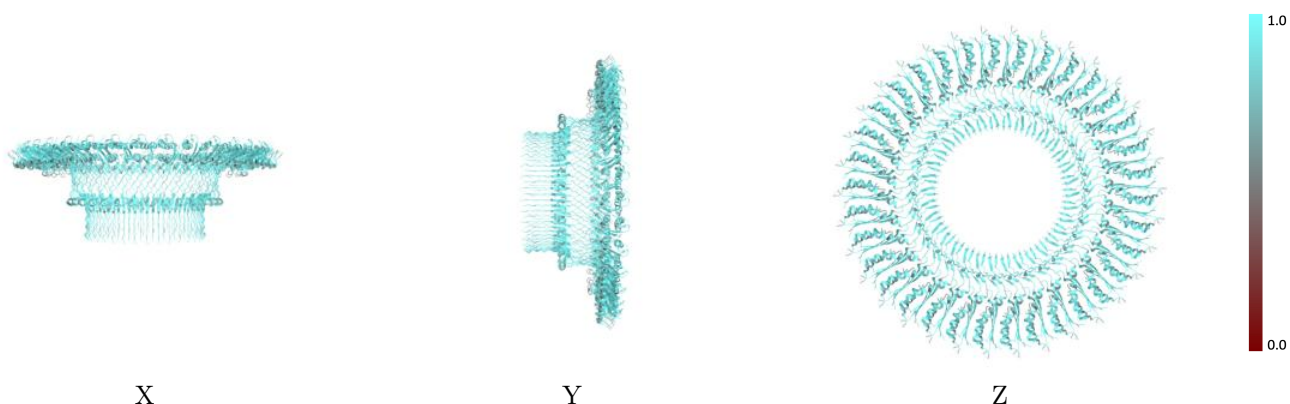
The images above show the 3D surface view of the map at the recommended contour level 0.01 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



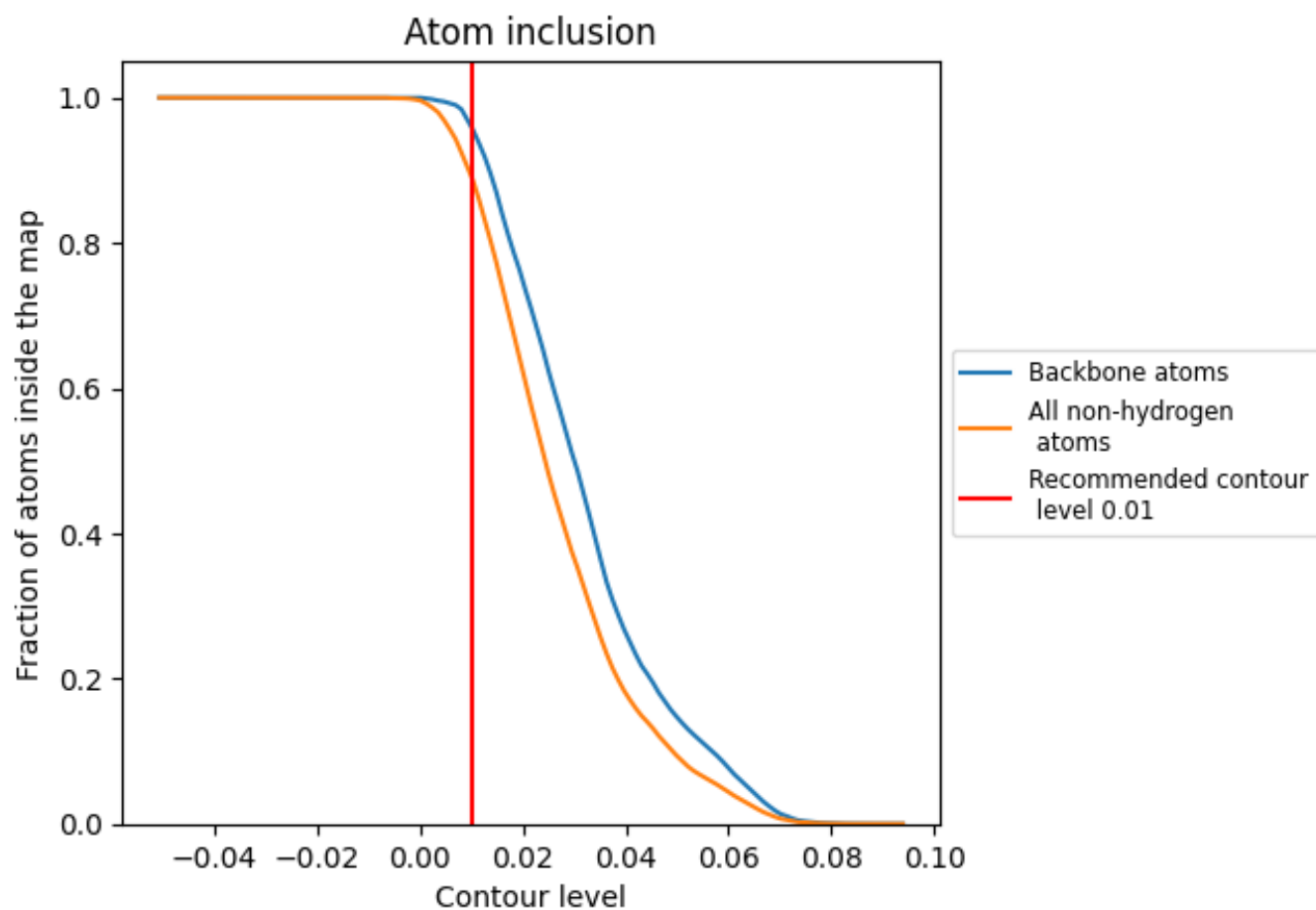
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.01).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 96% of all backbone atoms, 89% 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 (0.01) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.8909	 0.5920
A	 0.8919	 0.5910
B	 0.8928	 0.5920
C	 0.8919	 0.5930
D	 0.8859	 0.5930
E	 0.8885	 0.5920
F	 0.8928	 0.5900
G	 0.8885	 0.5950
H	 0.8928	 0.5950
I	 0.8928	 0.5920
J	 0.8979	 0.5920
K	 0.8962	 0.5900
L	 0.8911	 0.5890
M	 0.8894	 0.5910
N	 0.8825	 0.5890
O	 0.8902	 0.5930
P	 0.8902	 0.5910
Q	 0.8919	 0.5900
R	 0.8937	 0.5910
S	 0.8928	 0.5940
T	 0.8928	 0.5960
U	 0.8928	 0.5960
V	 0.8928	 0.5930
W	 0.8885	 0.5910
X	 0.8928	 0.5950
Y	 0.8937	 0.5930
Z	 0.8928	 0.5880
a	 0.8937	 0.5880
b	 0.8919	 0.5880
c	 0.8937	 0.5910
d	 0.8756	 0.5850
e	 0.8851	 0.5930
f	 0.8919	 0.5950
g	 0.8859	 0.5920
h	 0.8911	 0.5930

