



Full wwPDB EM Validation Report ⓘ

Mar 13, 2026 – 09:05 AM UTC

PDB ID : 8Q8D / pdb_00008q8d
EMDB ID : EMD-18251
Title : Tau - AD-LIA6 (tau intermediate amyloid)
Authors : Lovestam, S.; Li, D.; Scheres, S.H.W.; Goedert, M.
Deposited on : 2023-08-18
Resolution : Not provided

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.dev132
MolProbity : 4-5-2 with Phenix2.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
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) : 2.49

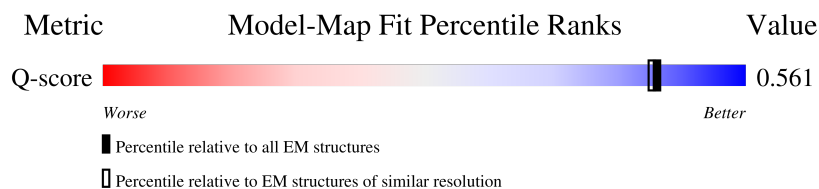
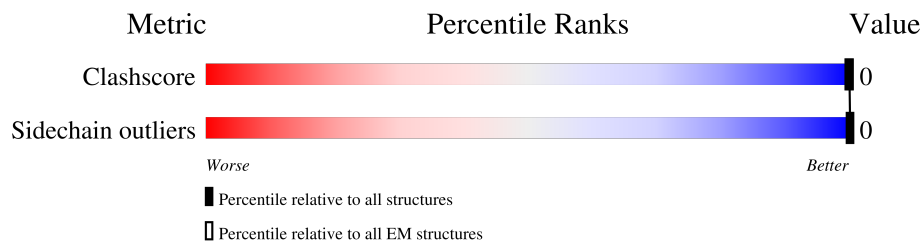
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is unknown.

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	229148	23984	-
Sidechain outliers	223484	23102	-
Q-score	-	25397	13952 (2.54 - 3.54)

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	1-A	382	
1	1-B	382	
1	1-C	382	
1	1-D	382	
1	1-E	382	

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Mol	Chain	Length	Quality of chain
1	1-F	382	 A horizontal bar chart showing the quality of the chain. The bar is divided into two segments: a green segment on the left representing 20% and a grey segment on the right representing 80%. The labels '20%' and '80%' are positioned below their respective segments.

2 Entry composition

There is only 1 type of molecule in this entry. The entry contains 6982 atoms, of which 3558 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 Isoform Tau-D of Microtubule-associated protein tau.

Mol	Chain	Residues	Atoms						AltConf	Trace
1	1-A	74	Total	C	H	N	O	S	0	1
			1133	348	575	103	106	1		
1	1-B	76	Total	C	H	N	O	S	0	0
			1179	362	601	107	108	1		
1	1-C	76	Total	C	H	N	O	S	0	0
			1179	362	601	107	108	1		
1	1-D	76	Total	C	H	N	O	S	0	0
			1179	362	601	107	108	1		
1	1-E	74	Total	C	H	N	O	S	0	0
			1132	348	578	103	102	1		
1	?-E	1	Total H						0	0
					1	1				
1	1-F	76	Total	C	H	N	O	S	0	0
			1179	362	601	107	108	1		

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	?	-	ALA	deletion	UNP P10636
B	?	-	ALA	deletion	UNP P10636
C	?	-	ALA	deletion	UNP P10636
D	?	-	-	?	U ?

SEQUENCE-PLOTS INFOmissingINFO

3 Experimental information

Property	Value	Source
EM reconstruction method	HELICAL	Depositor
Imposed symmetry	HELICAL, twist=-1.07°, rise=4.77 Å, axial sym=C1	Depositor
Number of segments used	Not provided	
Resolution determination method	Not provided	
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)	500	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	FEI FALCON IV (4k x 4k)	Depositor
Maximum map value	0.044	Depositor
Minimum map value	-0.019	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.002	Depositor
Recommended contour level	0.0087	Depositor
Map size (Å)	316.41602, 316.41602, 316.41602	wwPDB
Map dimensions	384, 384, 384	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.82400006, 0.82400006, 0.82400006	Depositor

4 Model quality [i](#)

4.1 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	1-A	0.68	0/570	1.22	1/763 (0.1%)
1	1-B	0.70	0/587	1.24	2/785 (0.3%)
1	1-C	0.71	0/587	1.30	4/785 (0.5%)
1	1-D	0.69	0/587	1.21	2/785 (0.3%)
1	1-E	0.68	0/571	1.24	2/763 (0.3%)
1	1-F	0.69	0/587	1.27	1/785 (0.1%)
All	All	0.69	0/3489	1.25	12/4666 (0.3%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	1-E	0	1

There are no bond length outliers.

All (12) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	1-D	358	ASP	CA-CB-CG	6.39	118.99	112.60
1	1-B	358	ASP	CA-CB-CG	5.99	118.59	112.60
1	1-C	331	LYS	CB-CA-C	5.82	120.21	110.55
1	1-C	324	SER	N-CA-CB	-5.79	102.10	111.24
1	1-E	346	PHE	CA-CB-CG	5.54	119.34	113.80
1	1-C	331	LYS	N-CA-CB	-5.33	100.28	110.61
1	1-C	346	PHE	CA-CB-CG	5.25	119.05	113.80
1	1-A	346	PHE	CA-CB-CG	5.21	119.01	113.80
1	1-B	330	HIS	CB-CG-CD2	-5.07	124.61	131.20
1	1-E	348	ASP	CA-CB-CG	5.05	117.65	112.60
1	1-D	330	HIS	CB-CG-CD2	-5.04	124.65	131.20
1	1-F	330	HIS	CB-CG-CD2	-5.01	124.69	131.20

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	1-E	310	TYR	Sidechain

4.2 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	1-A	558	575	576	0	0
1	1-B	578	601	600	0	0
1	1-C	578	601	600	0	0
1	1-D	578	601	600	0	0
1	1-E	554	578	590	0	0
1	?-E	0	1	0	0	0
1	1-F	578	601	600	0	0
All	All	3424	3558	3566	0	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 0.

There are no clashes within the asymmetric unit.

There are no symmetry-related clashes.

4.3 Torsion angles [i](#)

4.3.1 Protein backbone [i](#)

There are no protein backbone outliers to report in this entry.

4.3.2 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	1-A	64/312 (20%)	64 (100%)	0	100	100
1	1-B	66/312 (21%)	66 (100%)	0	100	100
1	1-C	66/312 (21%)	66 (100%)	0	100	100
1	1-D	36/312 (12%)	36 (100%)	0	100	100
1	1-E	64/312 (20%)	64 (100%)	0	100	100
1	1-F	66/312 (21%)	66 (100%)	0	100	100
All	All	362/1872 (19%)	362 (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 (6) such sidechains are listed below:

Mol	Chain	Res	Type
1	1-B	330	HIS
1	1-B	336	GLN
1	1-D	359	ASN
1	1-E	327	ASN
1	1-F	330	HIS
1	1-F	336	GLN

4.3.3 RNA ⓘ

There are no RNA molecules in this entry.

4.4 Non-standard residues in protein, DNA, RNA chains ⓘ

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

4.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

4.6 Ligand geometry ⓘ

There are no ligands in this entry.

4.7 Other polymers [i](#)

There are no such residues in this entry.

4.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

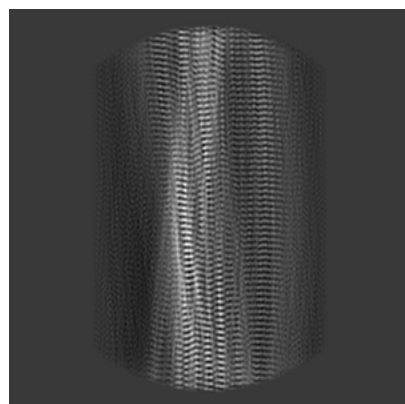
5 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-18251. These allow visual inspection of the internal detail of the map and identification of artifacts.

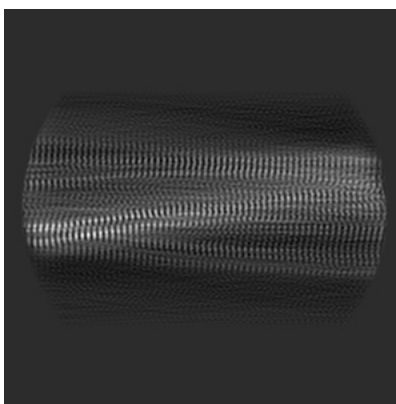
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

5.1 Orthogonal projections [i](#)

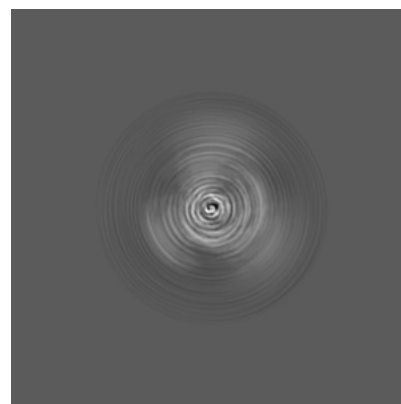
5.1.1 Primary map



X

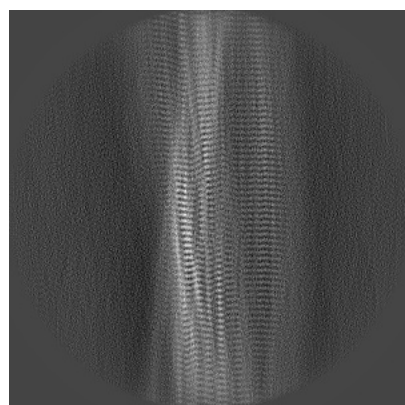


Y

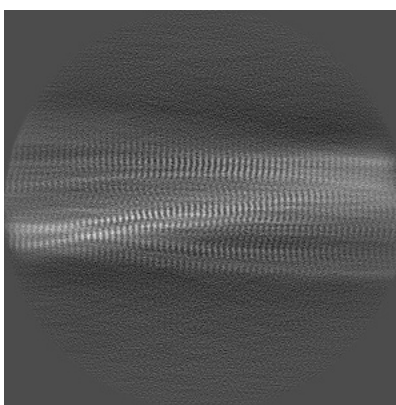


Z

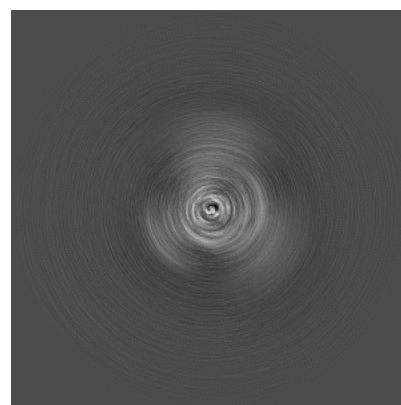
5.1.2 Raw map



X



Y

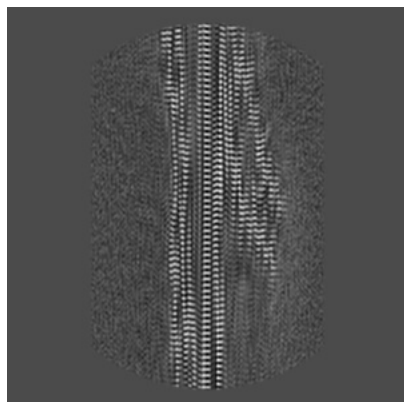


Z

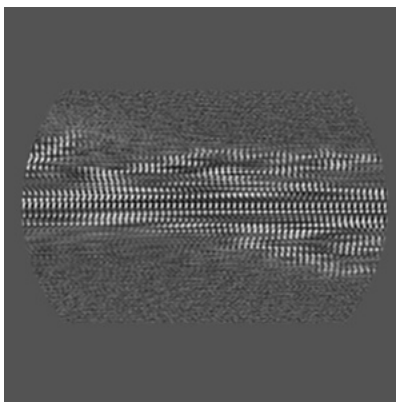
The images above show the map projected in three orthogonal directions.

5.2 Central slices [i](#)

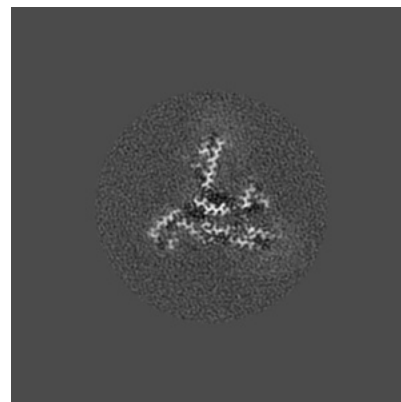
5.2.1 Primary map



X Index: 192

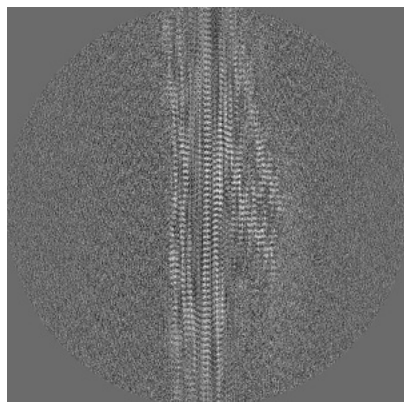


Y Index: 192

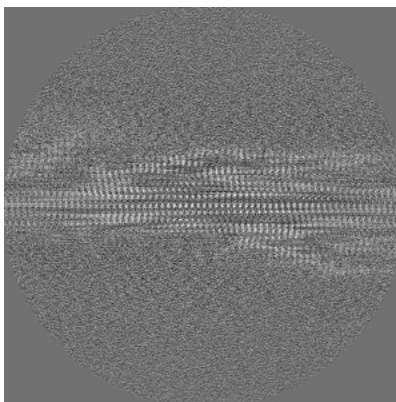


Z Index: 192

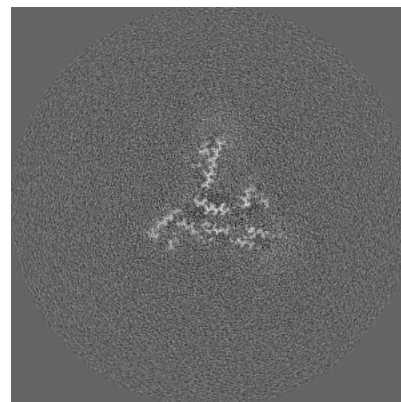
5.2.2 Raw map



X Index: 192



Y Index: 192

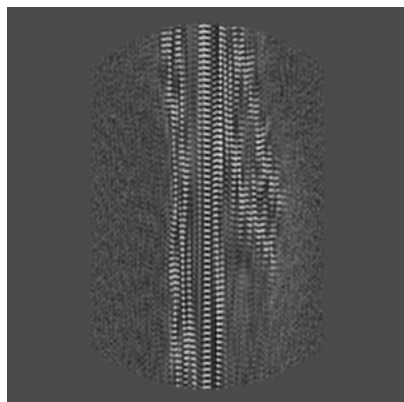


Z Index: 192

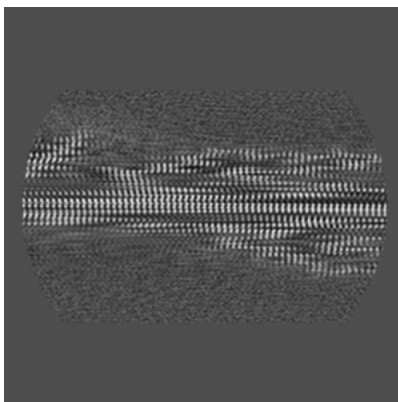
The images above show central slices of the map in three orthogonal directions.

5.3 Largest variance slices [i](#)

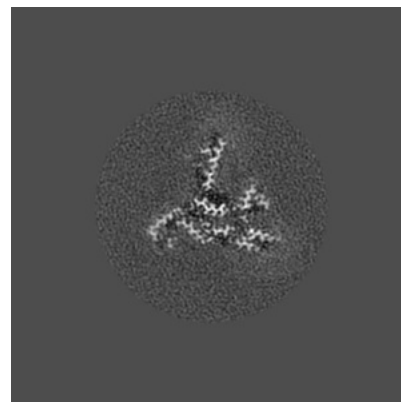
5.3.1 Primary map



X Index: 193

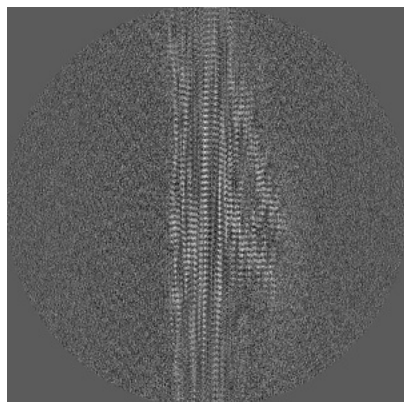


Y Index: 190

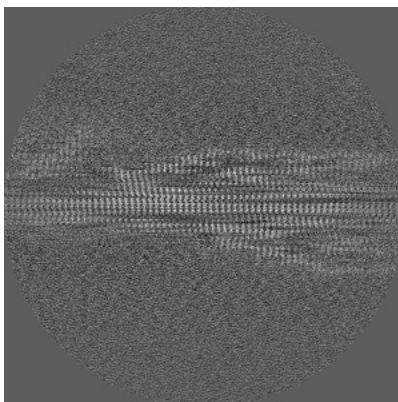


Z Index: 204

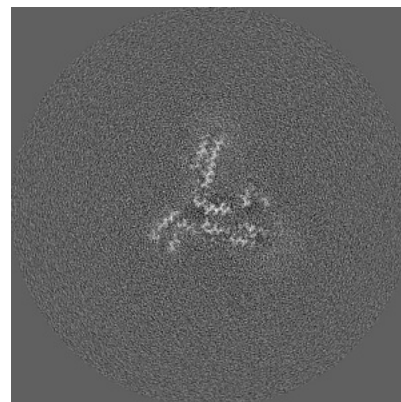
5.3.2 Raw map



X Index: 188



Y Index: 190

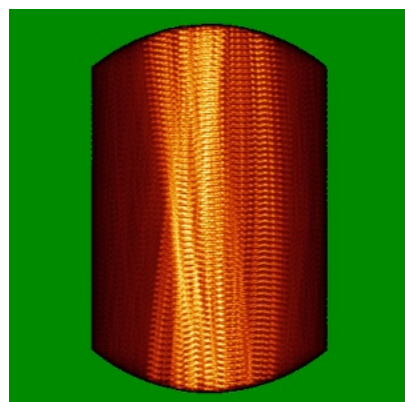


Z Index: 180

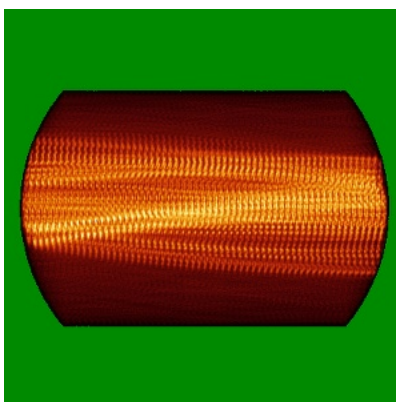
The images above show the largest variance slices of the map in three orthogonal directions.

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

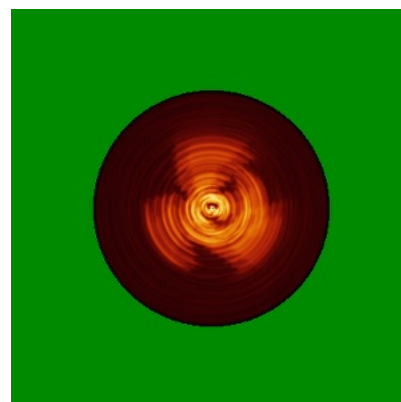
5.4.1 Primary map



X

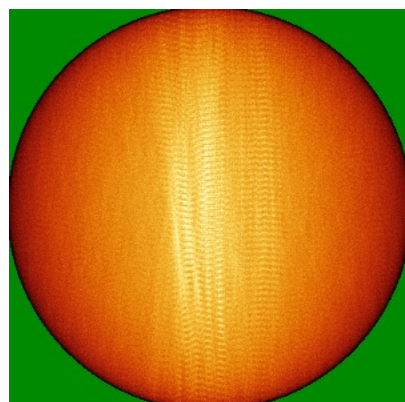


Y

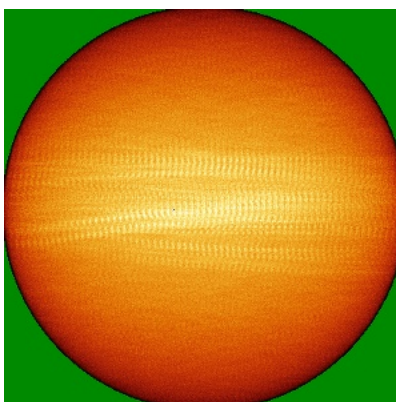


Z

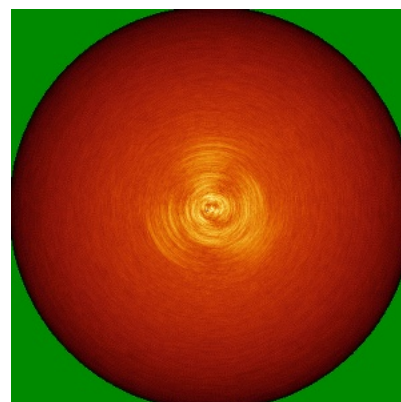
5.4.2 Raw map



X



Y

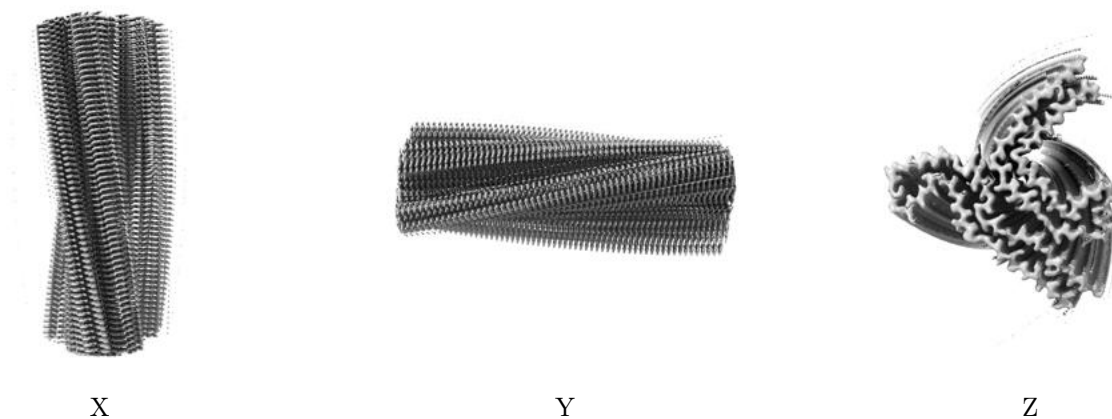


Z

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.

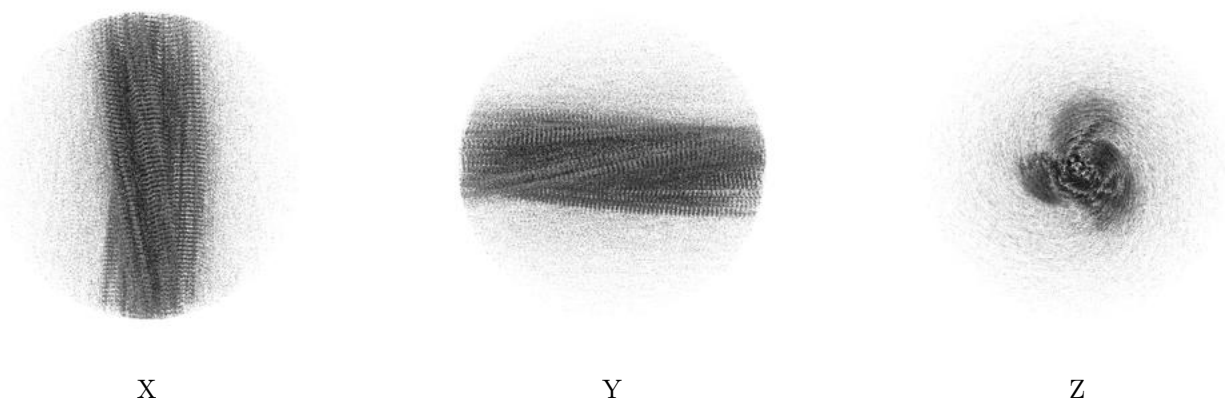
5.5 Orthogonal surface views [i](#)

5.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.0087. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

5.5.2 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.

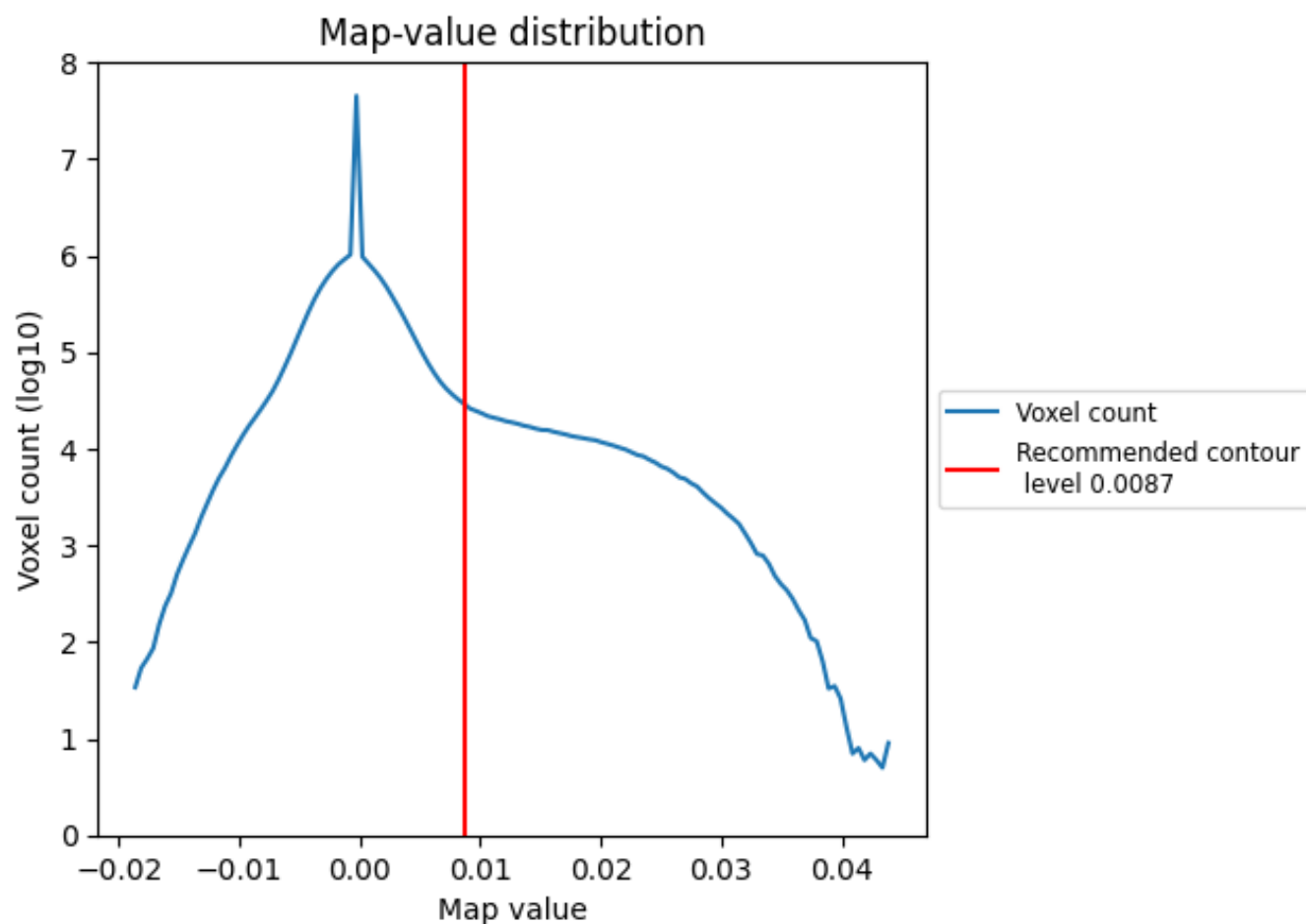
5.6 Mask visualisation [i](#)

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

6 Map analysis [i](#)

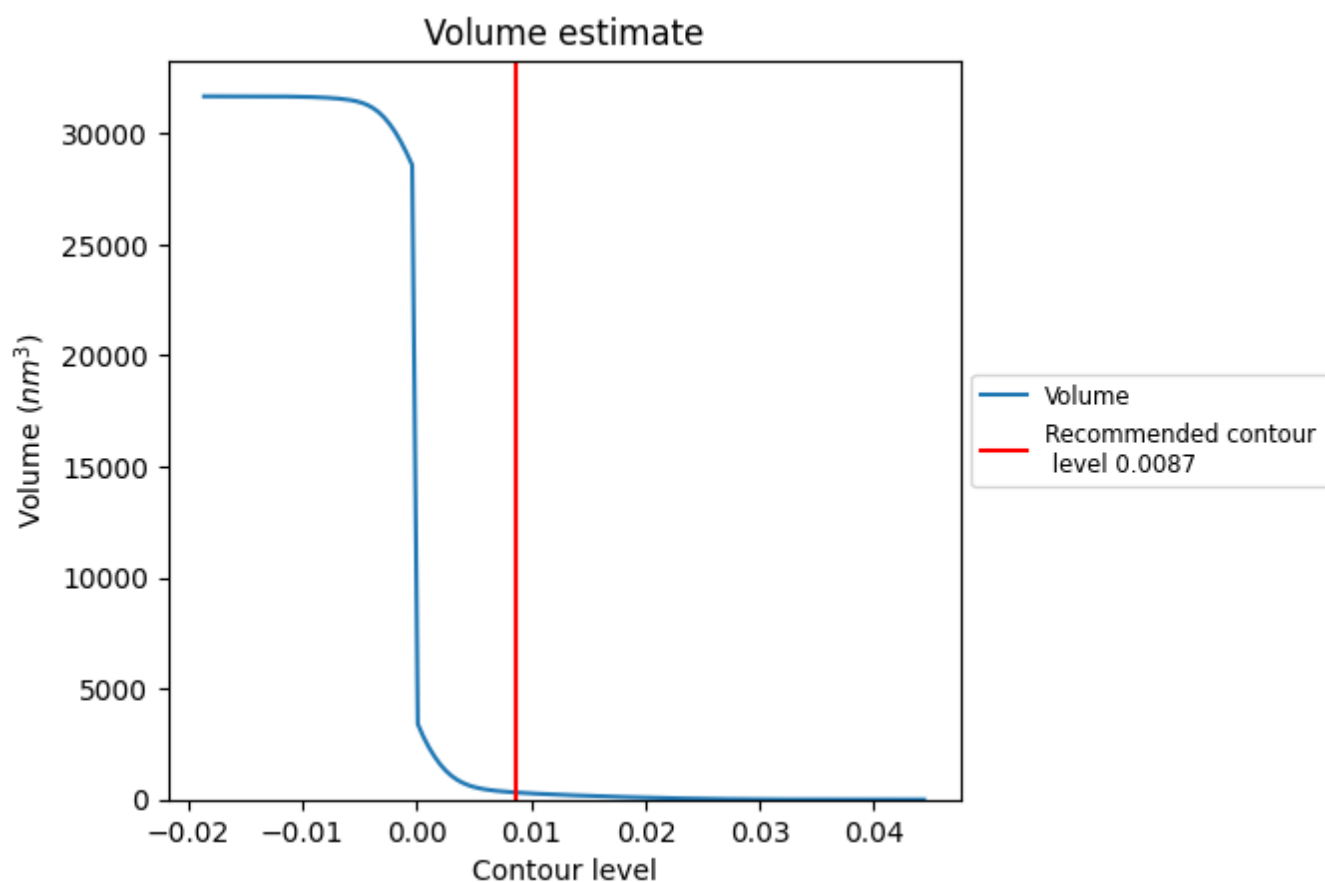
This section contains the results of statistical analysis of the map.

6.1 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.

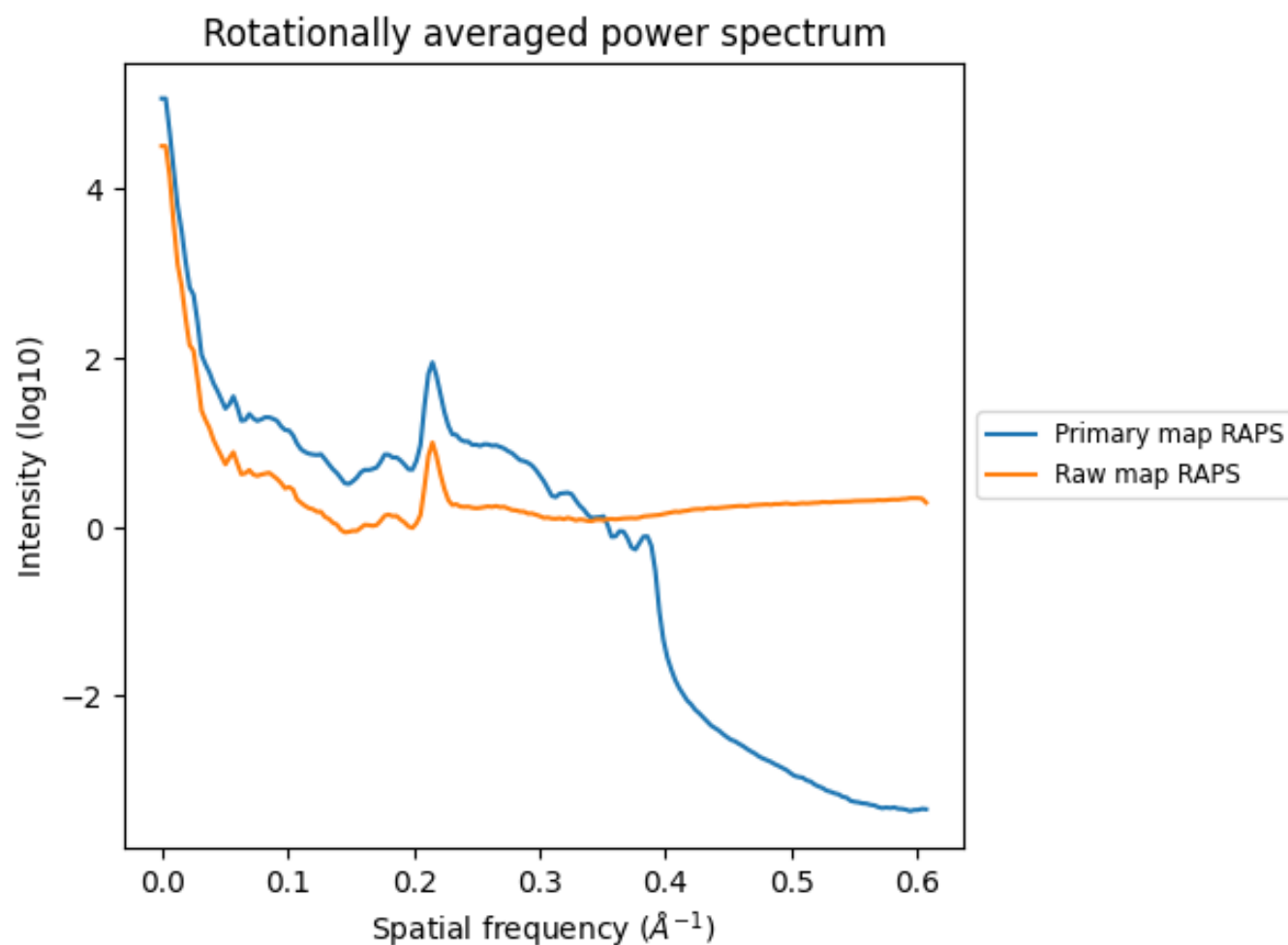
6.2 Volume estimate [i](#)



The volume at the recommended contour level is 317 nm³; this corresponds to an approximate mass of 286 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.

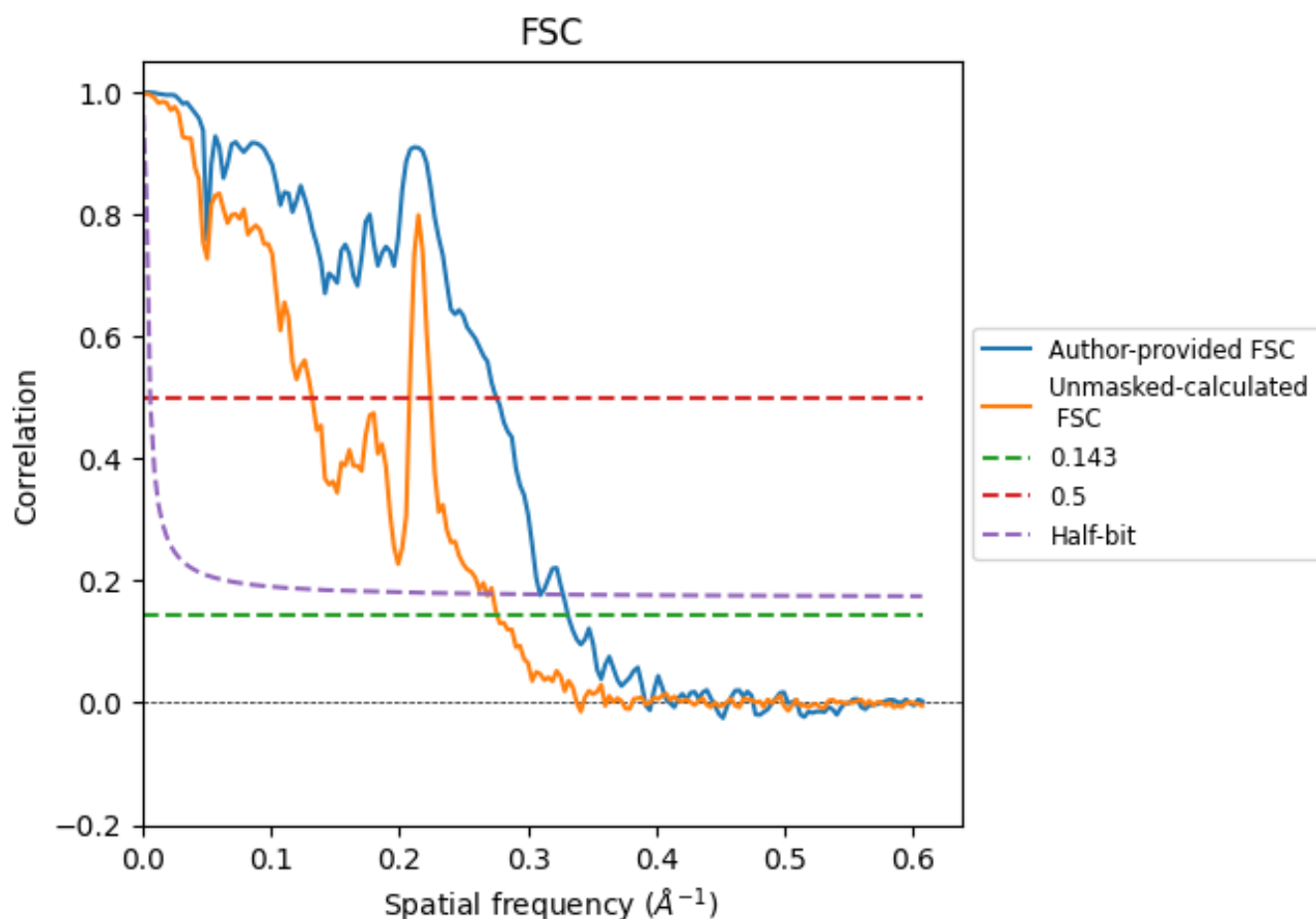
6.3 Rotationally averaged power spectrum ⓘ



7 Fourier-Shell correlation ⓘ

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.

7.1 FSC ⓘ



7.2 Resolution estimates [i](#)

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	-	-	-
Author-provided FSC curve	3.02	3.63	3.23
Unmasked-calculated*	3.62	7.56	3.73

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps.

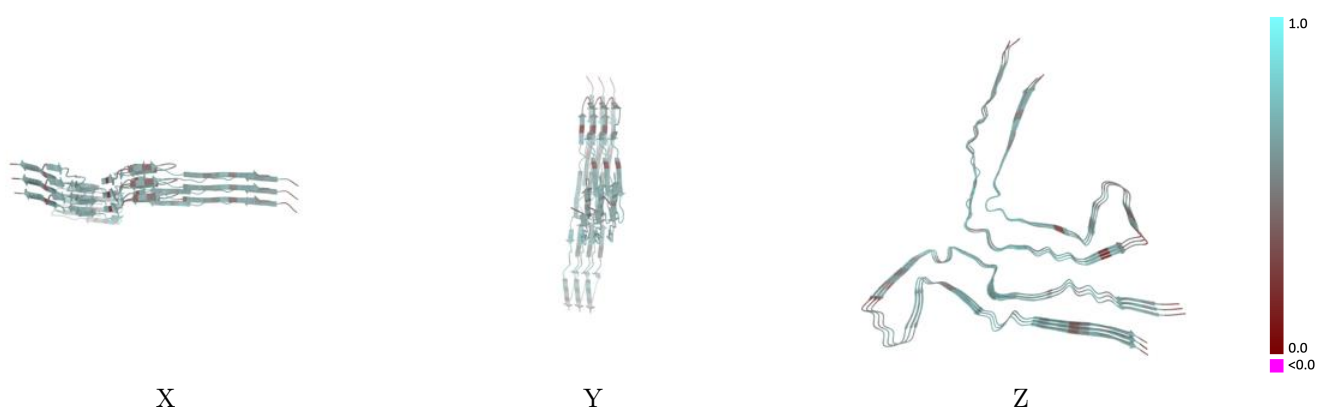
8 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-18251 and PDB model 8Q8D. Per-residue inclusion information can be found in section ?? on page ??.

8.1 Map-model overlay [i](#)

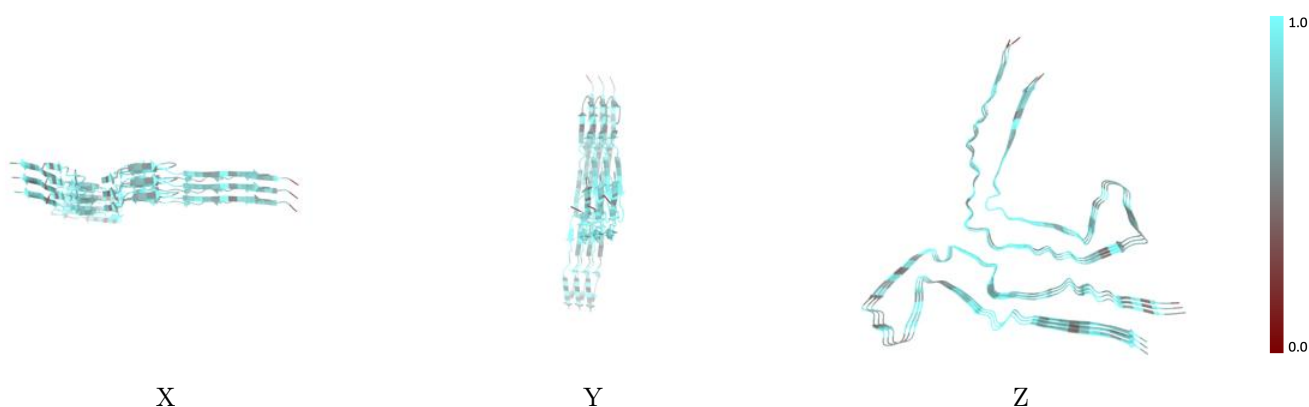
This section was not generated.

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



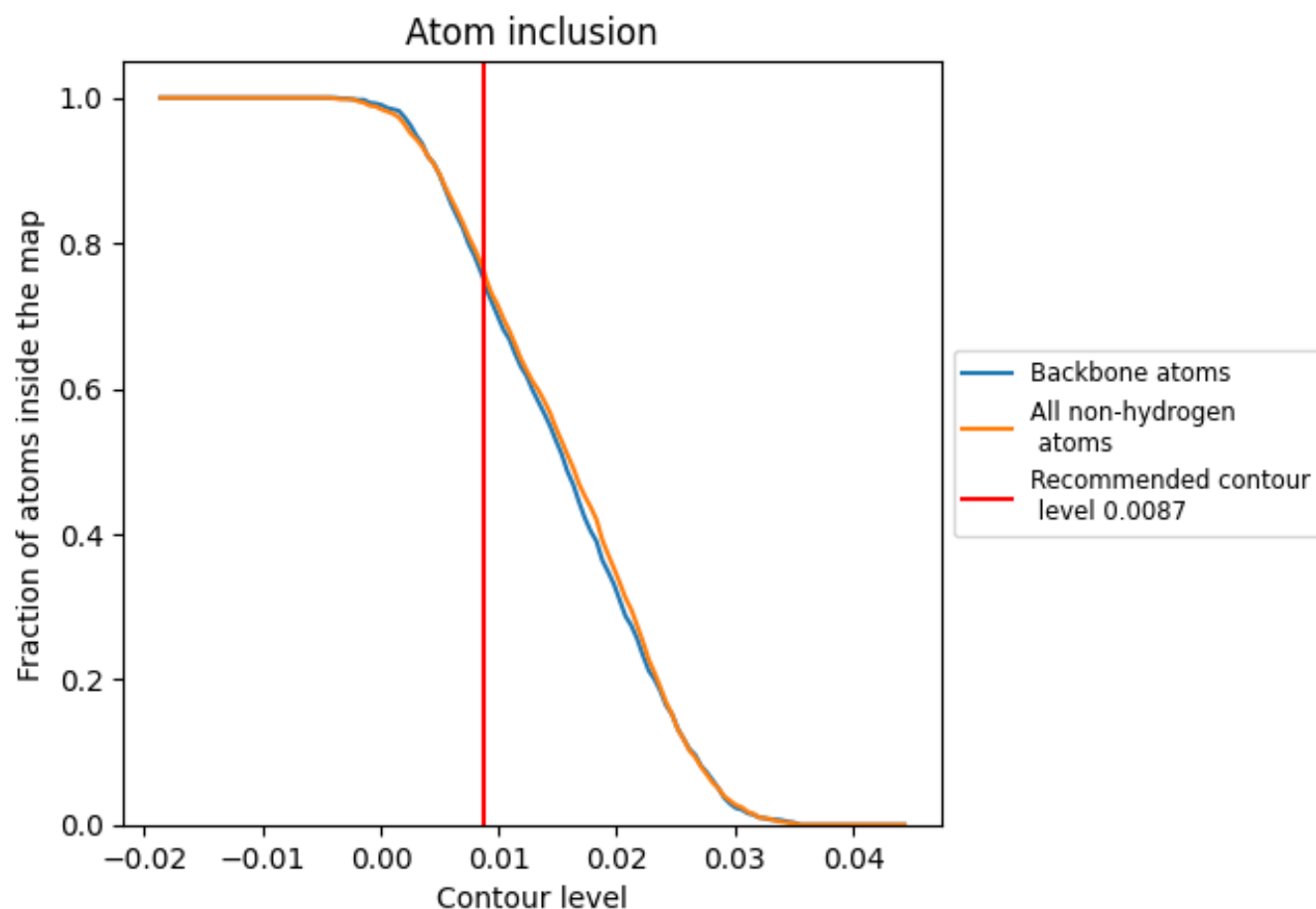
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

8.3 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 (0.0087).

8.4 Atom inclusion [i](#)



At the recommended contour level, 75% of all backbone atoms, 76% of all non-hydrogen atoms, are inside the map.

8.5 Map-model fit summary ⓘ

The table lists the average atom inclusion at the recommended contour level (0.0087) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7650	0.5610
A	0.7710	0.5590
B	0.7780	0.5710
C	0.7560	0.5440
D	0.7770	0.5690
E	0.7700	0.5540
F	0.7700	0.5690

