



wwPDB EM Validation Summary Report ⓘ

Apr 5, 2026 – 06:17 PM UTC

PDB ID : 9VBT / pdb_00009vbt
EMDB ID : EMD-64933
Title : Cryo-EM structure of the multi-component acyltransferase complex MucABC from *Streptococcus macacae* at a stoichiometric ratio of 4:4:4
Authors : Luo, Z.; Shen, Z.; Liao, G.; Tang, X.; Pan, X.
Deposited on : 2025-06-04
Resolution : 2.32 Å(reported)
Based on initial model : .

This is a wwPDB EM Validation Summary 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:

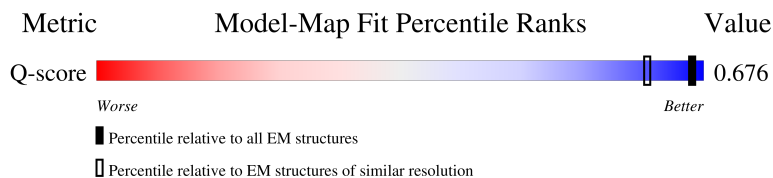
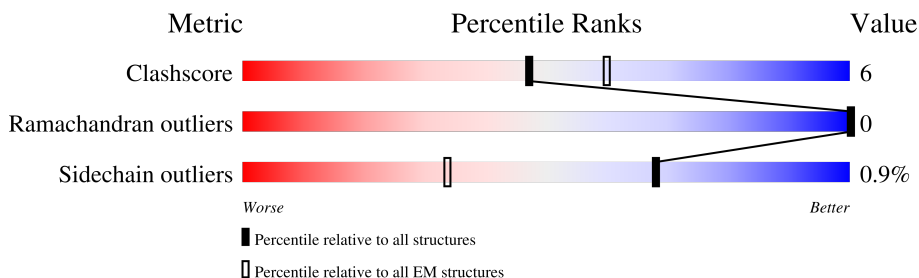
EMDB validation analysis : 0.0.1.dev132
Mogul : 2022.3.0, CSD as543be (2022)
MolProbity : 4-5-2 with Phenix2.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ : 1.9.13
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 i

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

The reported resolution of this entry is 2.32 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.




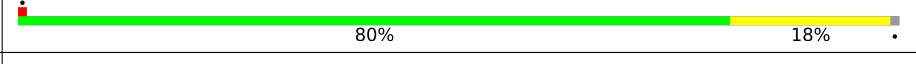



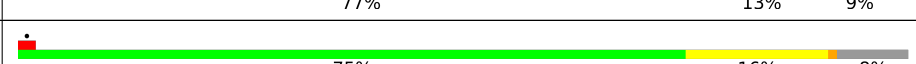
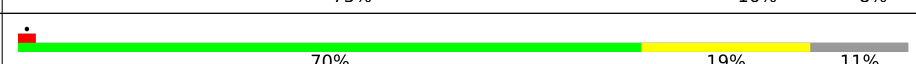
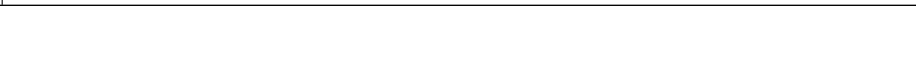
Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
Q-score	-	25397	4359 (1.82 - 2.82)

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	359	 85% 14%
1	B	359	 85% 14%
1	C	359	 84% 15%
1	D	359	 86% 13%

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Mol	Chain	Length	Quality of chain
2	G	148	 81% 14% 5%
2	H	148	 80% 18% 2%
2	K	148	 78% 17% 5%
2	L	148	 75% 17% 7%
3	E	411	 79% 14% 6%
3	F	411	 77% 13% 9%
3	I	411	 75% 16% 8%
3	J	411	 70% 19% 11%

2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 26945 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 3-oxoacyl-[acyl-carrier-protein (ACP)] synthase III, C-terminal domain protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	355	2774	1763	458	545	8	0	0
1	B	354	2771	1761	457	545	8	0	0
1	C	354	2771	1761	457	545	8	0	0
1	D	355	2780	1767	458	547	8	0	0

- Molecule 2 is a protein called 2,4-diacetylphloroglucinol biosynthesis protein PhlB family protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	H	146	1173	744	202	218	9	0	0
2	K	140	1127	717	196	206	8	0	0
2	L	137	1098	696	191	203	8	0	0
2	G	141	1128	714	197	209	8	0	0

- Molecule 3 is a protein called 3-oxoacyl-[acyl-carrier-protein (ACP)] synthase III domain protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	I	377	2843	1811	472	545	15	0	0
3	J	366	2752	1755	456	526	15	0	0
3	E	385	2915	1857	483	559	16	0	0

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Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	F	372	2809	1792	466	536	15	0	0

There are 32 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
I	404	LEU	-	expression tag	UNP G5JW77
I	405	GLU	-	expression tag	UNP G5JW77
I	406	HIS	-	expression tag	UNP G5JW77
I	407	HIS	-	expression tag	UNP G5JW77
I	408	HIS	-	expression tag	UNP G5JW77
I	409	HIS	-	expression tag	UNP G5JW77
I	410	HIS	-	expression tag	UNP G5JW77
I	411	HIS	-	expression tag	UNP G5JW77
J	404	LEU	-	expression tag	UNP G5JW77
J	405	GLU	-	expression tag	UNP G5JW77
J	406	HIS	-	expression tag	UNP G5JW77
J	407	HIS	-	expression tag	UNP G5JW77
J	408	HIS	-	expression tag	UNP G5JW77
J	409	HIS	-	expression tag	UNP G5JW77
J	410	HIS	-	expression tag	UNP G5JW77
J	411	HIS	-	expression tag	UNP G5JW77
E	404	LEU	-	expression tag	UNP G5JW77
E	405	GLU	-	expression tag	UNP G5JW77
E	406	HIS	-	expression tag	UNP G5JW77
E	407	HIS	-	expression tag	UNP G5JW77
E	408	HIS	-	expression tag	UNP G5JW77
E	409	HIS	-	expression tag	UNP G5JW77
E	410	HIS	-	expression tag	UNP G5JW77
E	411	HIS	-	expression tag	UNP G5JW77
F	404	LEU	-	expression tag	UNP G5JW77
F	405	GLU	-	expression tag	UNP G5JW77
F	406	HIS	-	expression tag	UNP G5JW77
F	407	HIS	-	expression tag	UNP G5JW77
F	408	HIS	-	expression tag	UNP G5JW77
F	409	HIS	-	expression tag	UNP G5JW77
F	410	HIS	-	expression tag	UNP G5JW77
F	411	HIS	-	expression tag	UNP G5JW77

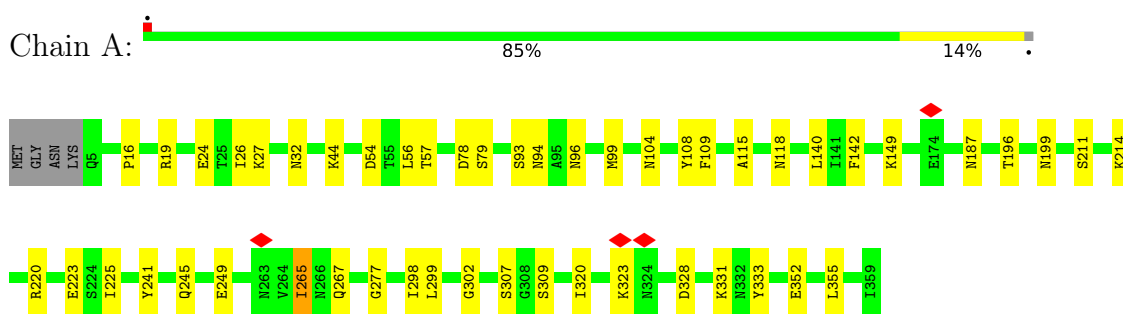
- Molecule 4 is ZINC ION (CCD ID: ZN) (formula: Zn) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
4	H	1	Total 1	Zn 1	0
4	K	1	Total 1	Zn 1	0
4	L	1	Total 1	Zn 1	0
4	G	1	Total 1	Zn 1	0

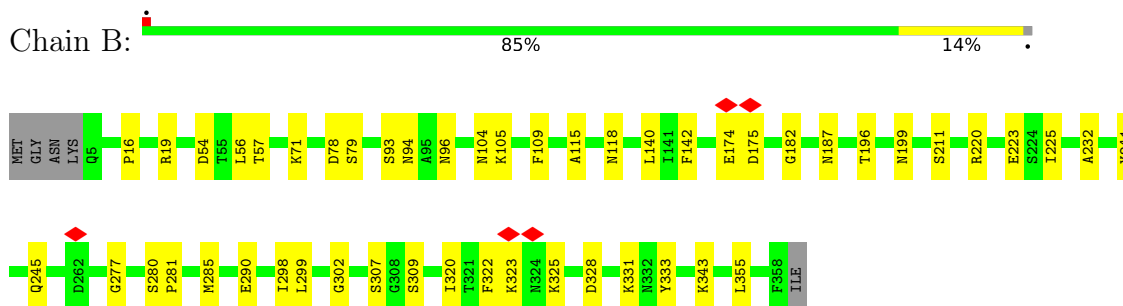
3 Residue-property plots [i](#)

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.

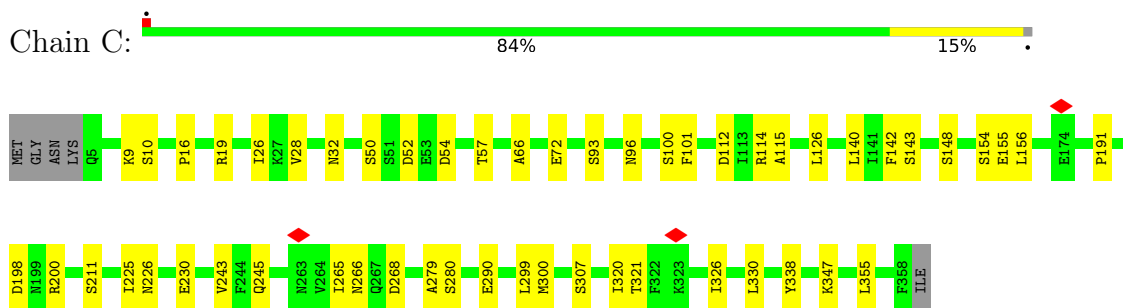
- Molecule 1: 3-oxoacyl-[acyl-carrier-protein (ACP)] synthase III, C-terminal domain protein



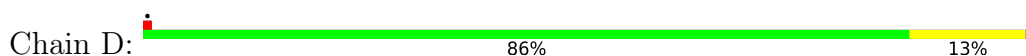
- Molecule 1: 3-oxoacyl-[acyl-carrier-protein (ACP)] synthase III, C-terminal domain protein

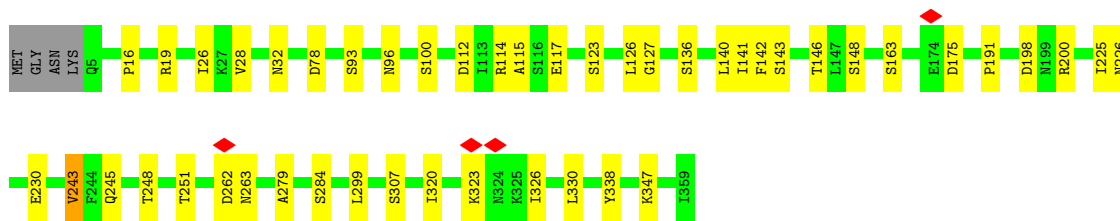


- Molecule 1: 3-oxoacyl-[acyl-carrier-protein (ACP)] synthase III, C-terminal domain protein



- Molecule 1: 3-oxoacyl-[acyl-carrier-protein (ACP)] synthase III, C-terminal domain protein





- Molecule 2: 2,4-diacetylphloroglucinol biosynthesis protein PhlB family protein

Chain H: 80% 18%



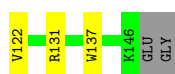
- Molecule 2: 2,4-diacetylphloroglucinol biosynthesis protein PhlB family protein

Chain K: 78% 17% 5%



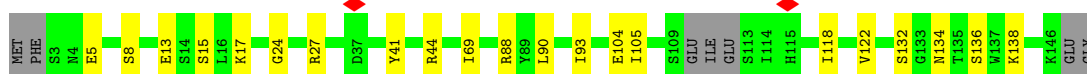
- Molecule 2: 2,4-diacetylphloroglucinol biosynthesis protein PhlB family protein

Chain L: 75% 17% 7%



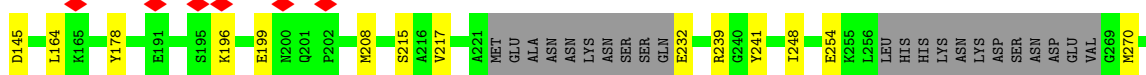
- Molecule 2: 2,4-diacetylphloroglucinol biosynthesis protein PhlB family protein

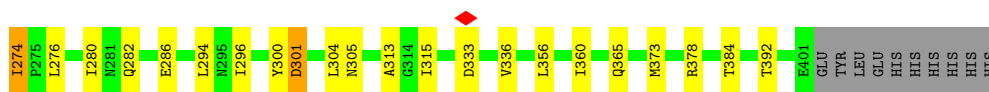
Chain G: 81% 14% 5%



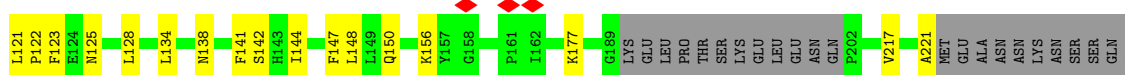
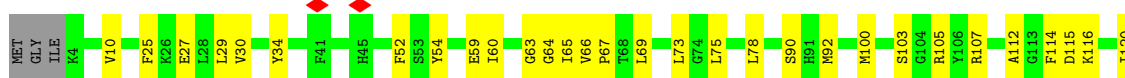
- Molecule 3: 3-oxoacyl-[acyl-carrier-protein (ACP)] synthase III domain protein

Chain I: 75% 16% 8%

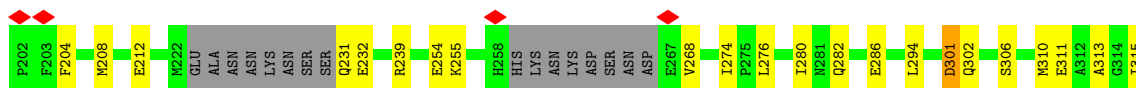
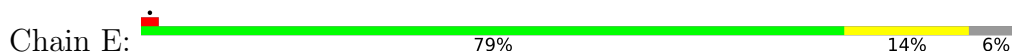




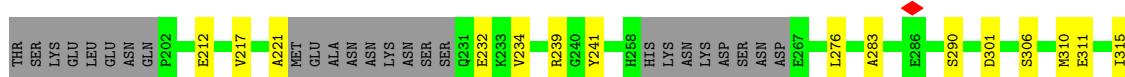
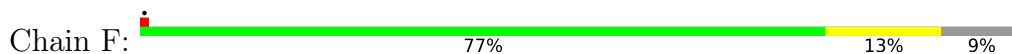
- Molecule 3: 3-oxoacyl-[acyl-carrier-protein (ACP)] synthase III domain protein



- Molecule 3: 3-oxoacyl-[acyl-carrier-protein (ACP)] synthase III domain protein



- Molecule 3: 3-oxoacyl-[acyl-carrier-protein (ACP)] synthase III domain protein





4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	71520	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	1800	Depositor
Magnification	Not provided	
Image detector	FEI FALCON IV (4k x 4k)	Depositor
Maximum map value	2.045	Depositor
Minimum map value	-1.244	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.091	Depositor
Recommended contour level	0.264	Depositor
Map size (Å)	237.312, 237.312, 237.312	wwPDB
Map dimensions	256, 256, 256	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.927, 0.927, 0.927	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: SCY, ZN

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	0.39	0/2823	0.54	1/3809 (0.0%)
1	B	0.38	0/2820	0.51	1/3806 (0.0%)
1	C	0.34	0/2820	0.46	0/3806
1	D	0.40	0/2829	0.54	0/3817
2	G	0.28	0/1149	0.44	0/1541
2	H	0.34	0/1196	0.49	0/1605
2	K	0.42	0/1149	0.55	0/1541
2	L	0.30	0/1118	0.46	0/1499
3	E	0.27	0/2957	0.42	0/3984
3	F	0.33	0/2849	0.45	0/3837
3	I	0.35	0/2883	0.49	0/3884
3	J	0.42	0/2790	0.57	0/3758
All	All	0.36	0/27383	0.50	2/36887 (0.0%)

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
2	L	0	1

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	118	ASN	N-CA-C	-5.63	106.07	113.17
1	A	118	ASN	N-CA-C	-5.51	106.23	113.17

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	L	27	ARG	Sidechain

5.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2774	0	2743	34	0
1	B	2771	0	2743	33	0
1	C	2771	0	2743	35	0
1	D	2780	0	2754	32	0
2	G	1128	0	1133	14	0
2	H	1173	0	1178	23	0
2	K	1127	0	1132	24	0
2	L	1098	0	1105	20	0
3	E	2915	0	2908	39	0
3	F	2809	0	2800	31	0
3	I	2843	0	2843	46	0
3	J	2752	0	2746	56	0
4	G	1	0	0	0	0
4	H	1	0	0	0	0
4	K	1	0	0	0	0
4	L	1	0	0	0	0
All	All	26945	0	26828	322	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 6.

The worst 5 of 322 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:J:125:ASN:HD21	2:K:79:VAL:HA	1.46	0.79
3:I:131:THR:HB	3:I:136:ASP:OD2	1.85	0.77
2:L:69:ILE:HD12	2:L:91:SER:HB2	1.67	0.77
1:A:211:SER:OG	3:I:21:ILE:HG12	1.86	0.76
3:E:10:VAL:HB	3:E:360:ILE:HG12	1.69	0.74

There are no symmetry-related clashes.

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	353/359 (98%)	343 (97%)	10 (3%)	0	100	100
1	B	352/359 (98%)	341 (97%)	11 (3%)	0	100	100
1	C	352/359 (98%)	346 (98%)	6 (2%)	0	100	100
1	D	353/359 (98%)	344 (98%)	9 (2%)	0	100	100
2	G	137/148 (93%)	135 (98%)	2 (2%)	0	100	100
2	H	144/148 (97%)	143 (99%)	1 (1%)	0	100	100
2	K	136/148 (92%)	133 (98%)	3 (2%)	0	100	100
2	L	133/148 (90%)	129 (97%)	4 (3%)	0	100	100
3	E	378/411 (92%)	366 (97%)	12 (3%)	0	100	100
3	F	363/411 (88%)	349 (96%)	14 (4%)	0	100	100
3	I	370/411 (90%)	358 (97%)	12 (3%)	0	100	100
3	J	357/411 (87%)	348 (98%)	9 (2%)	0	100	100
All	All	3428/3672 (93%)	3335 (97%)	93 (3%)	0	100	100

There are no Ramachandran outliers to report.

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	306/311 (98%)	305 (100%)	1 (0%)	86	92
1	B	307/311 (99%)	307 (100%)	0	100	100
1	C	307/311 (99%)	306 (100%)	1 (0%)	86	92
1	D	308/311 (99%)	306 (99%)	2 (1%)	78	88
2	G	128/134 (96%)	128 (100%)	0	100	100
2	H	133/134 (99%)	132 (99%)	1 (1%)	73	85
2	K	127/134 (95%)	126 (99%)	1 (1%)	73	85
2	L	124/134 (92%)	123 (99%)	1 (1%)	73	85
3	E	304/328 (93%)	300 (99%)	4 (1%)	61	76
3	F	291/328 (89%)	285 (98%)	6 (2%)	47	65
3	I	296/328 (90%)	290 (98%)	6 (2%)	48	66
3	J	285/328 (87%)	283 (99%)	2 (1%)	76	86
All	All	2916/3092 (94%)	2891 (99%)	25 (1%)	68	83

5 of 25 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	L	59	LYS
3	E	254	GLU
3	F	335	SER
3	E	172	SER
3	E	301	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 31 such sidechains are listed below:

Mol	Chain	Res	Type
3	J	96	GLN
3	F	83	ASN
3	J	344	ASN
3	F	206	ASN
3	E	281	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains

4 non-standard protein/DNA/RNA residues 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
3	SCY	J	87	3	7,8,9	0.59	0	4,9,11	0.30	0
3	SCY	E	87	3	7,8,9	0.56	0	4,9,11	0.18	0
3	SCY	F	87	3	7,8,9	0.58	0	4,9,11	0.30	0
3	SCY	I	87	3	7,8,9	0.65	0	4,9,11	0.30	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
3	SCY	J	87	3	-	3/5/7/9	-
3	SCY	E	87	3	-	2/5/7/9	-
3	SCY	F	87	3	-	3/5/7/9	-
3	SCY	I	87	3	-	2/5/7/9	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

5 of 10 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	I	87	SCY	OCD-CD-SG-CB
3	I	87	SCY	CE-CD-SG-CB
3	J	87	SCY	N-CA-CB-SG
3	E	87	SCY	OCD-CD-SG-CB
3	E	87	SCY	CE-CD-SG-CB

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 4 ligands modelled in this entry, 4 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

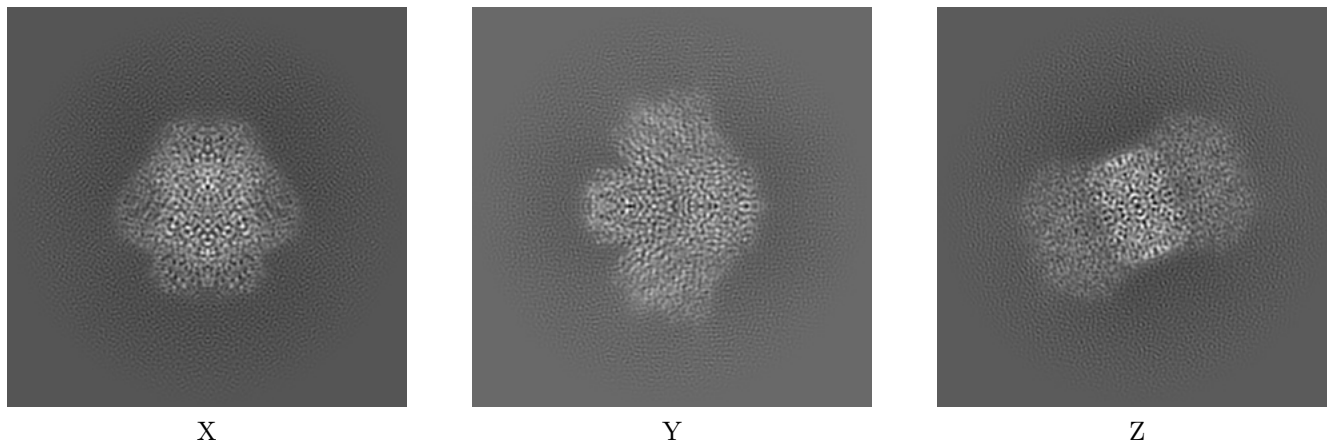
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-64933. These allow visual inspection of the internal detail of the map and identification of artifacts.

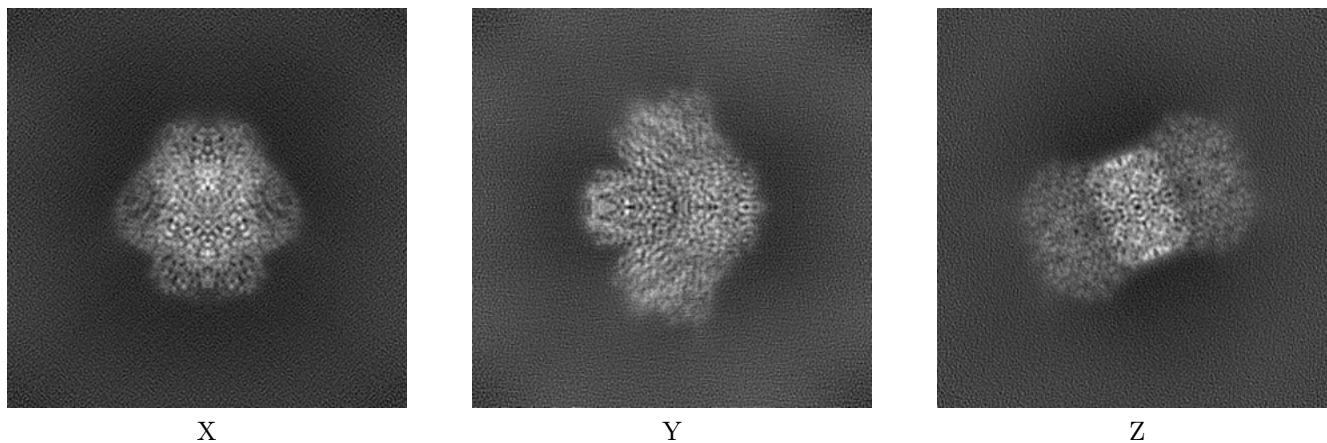
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

6.1.1 Primary map



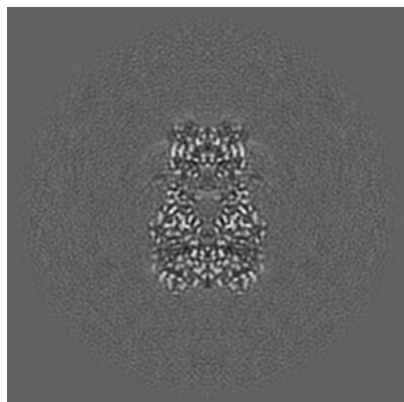
6.1.2 Raw map



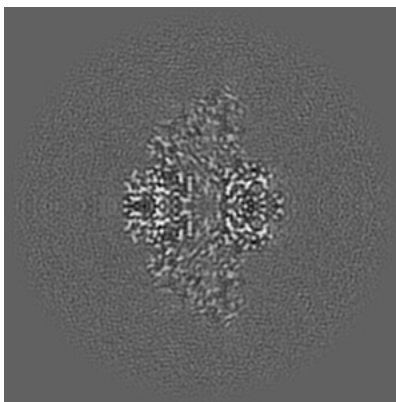
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

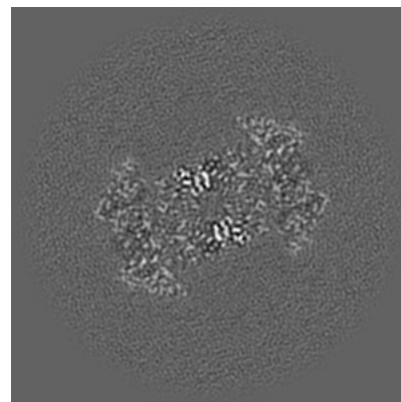
6.2.1 Primary map



X Index: 128

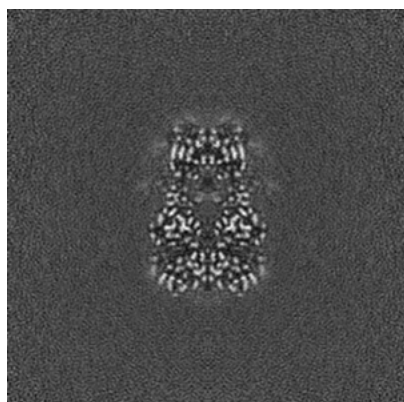


Y Index: 128

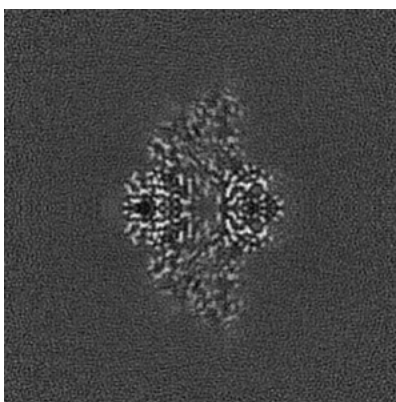


Z Index: 128

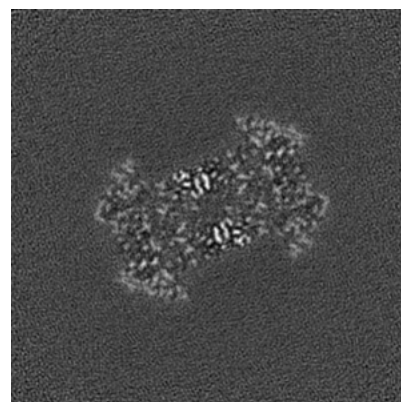
6.2.2 Raw map



X Index: 128



Y Index: 128

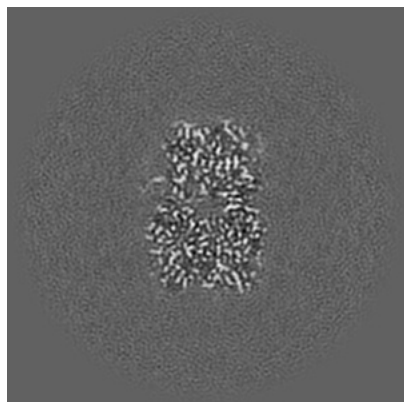


Z Index: 128

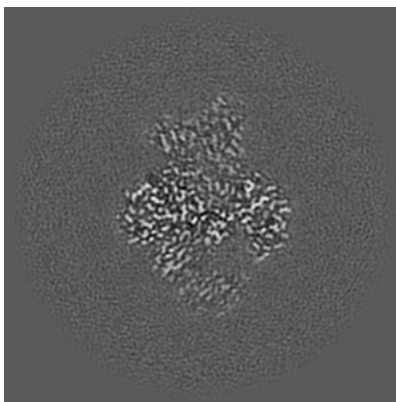
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

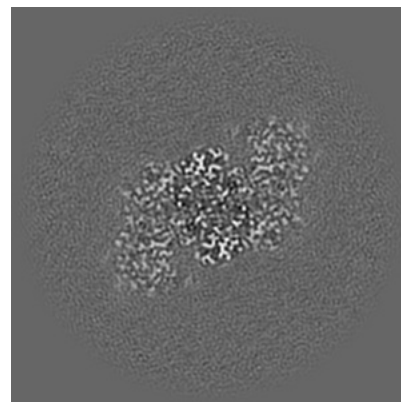
6.3.1 Primary map



X Index: 125

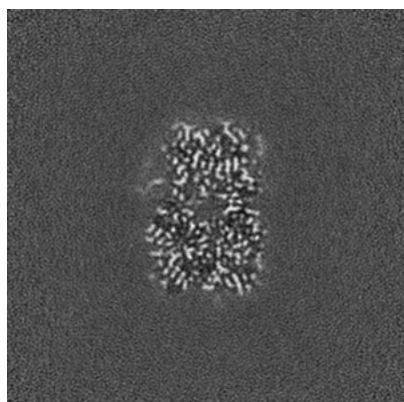


Y Index: 140

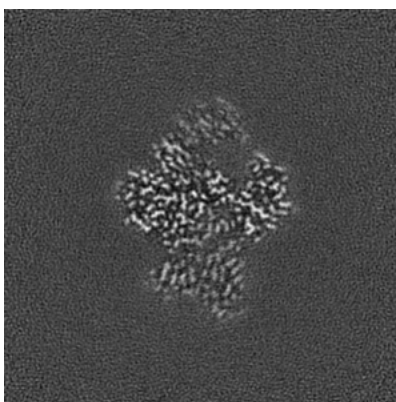


Z Index: 111

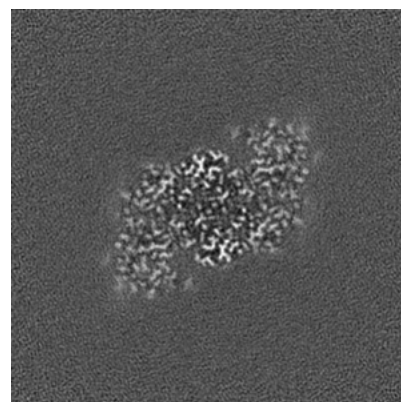
6.3.2 Raw map



X Index: 125



Y Index: 116

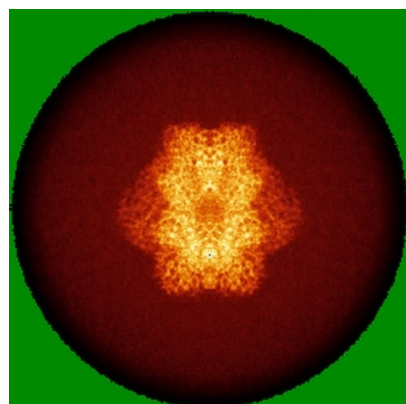


Z Index: 111

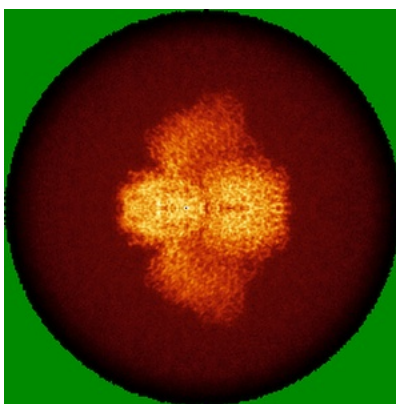
The images above show the largest variance slices of the map in three orthogonal directions.

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

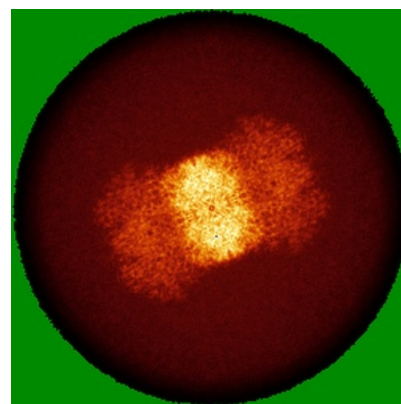
6.4.1 Primary map



X

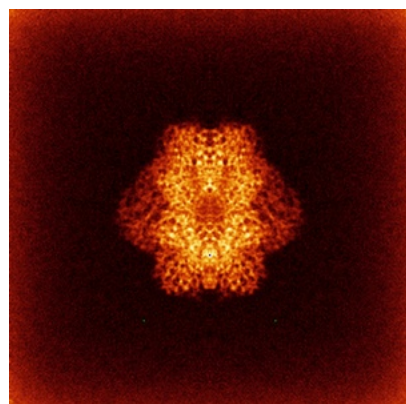


Y

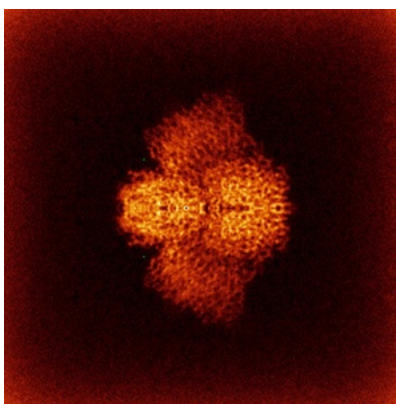


Z

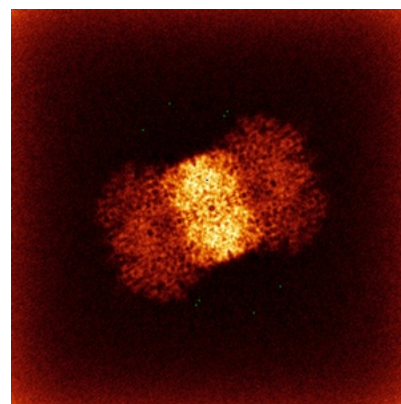
6.4.2 Raw map



X



Y

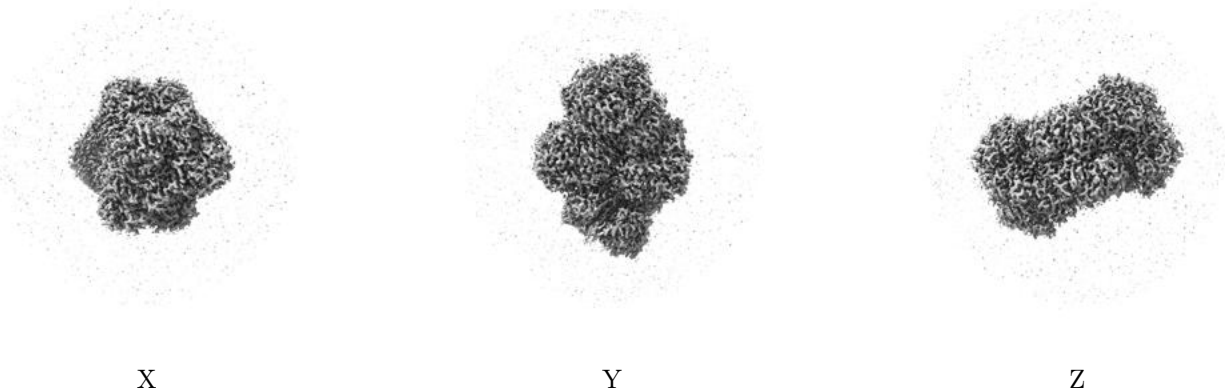


Z

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.

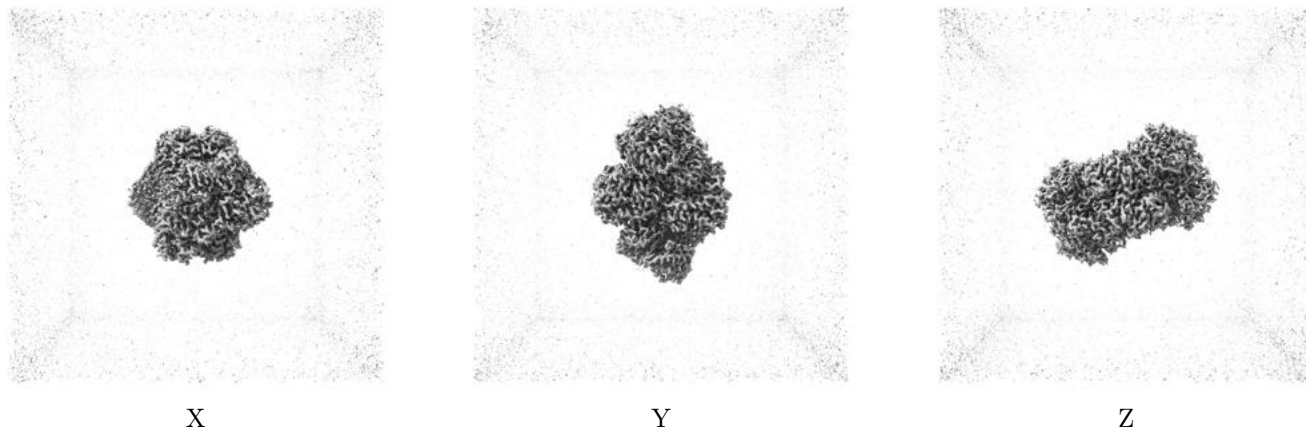
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.264. 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.

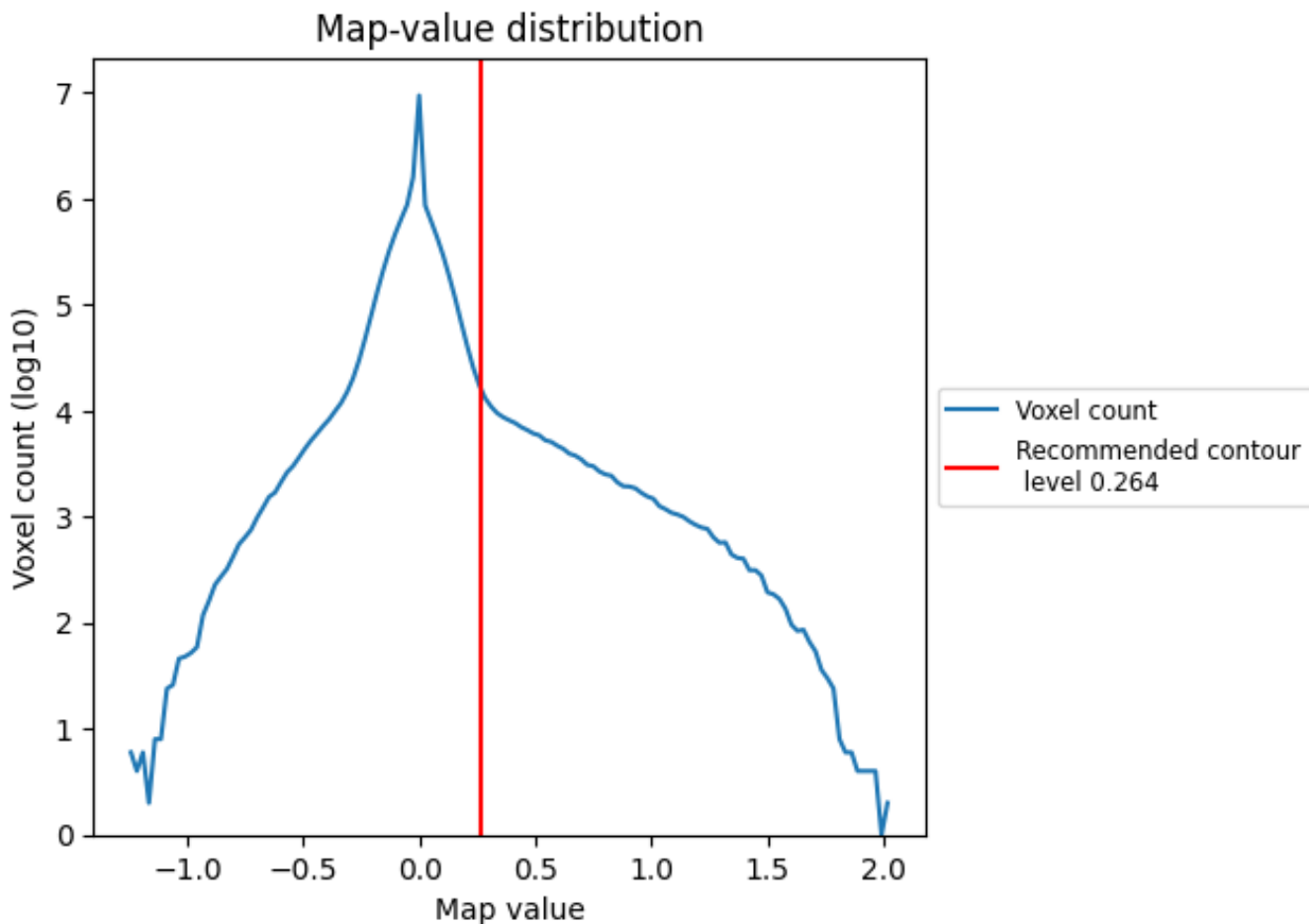
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

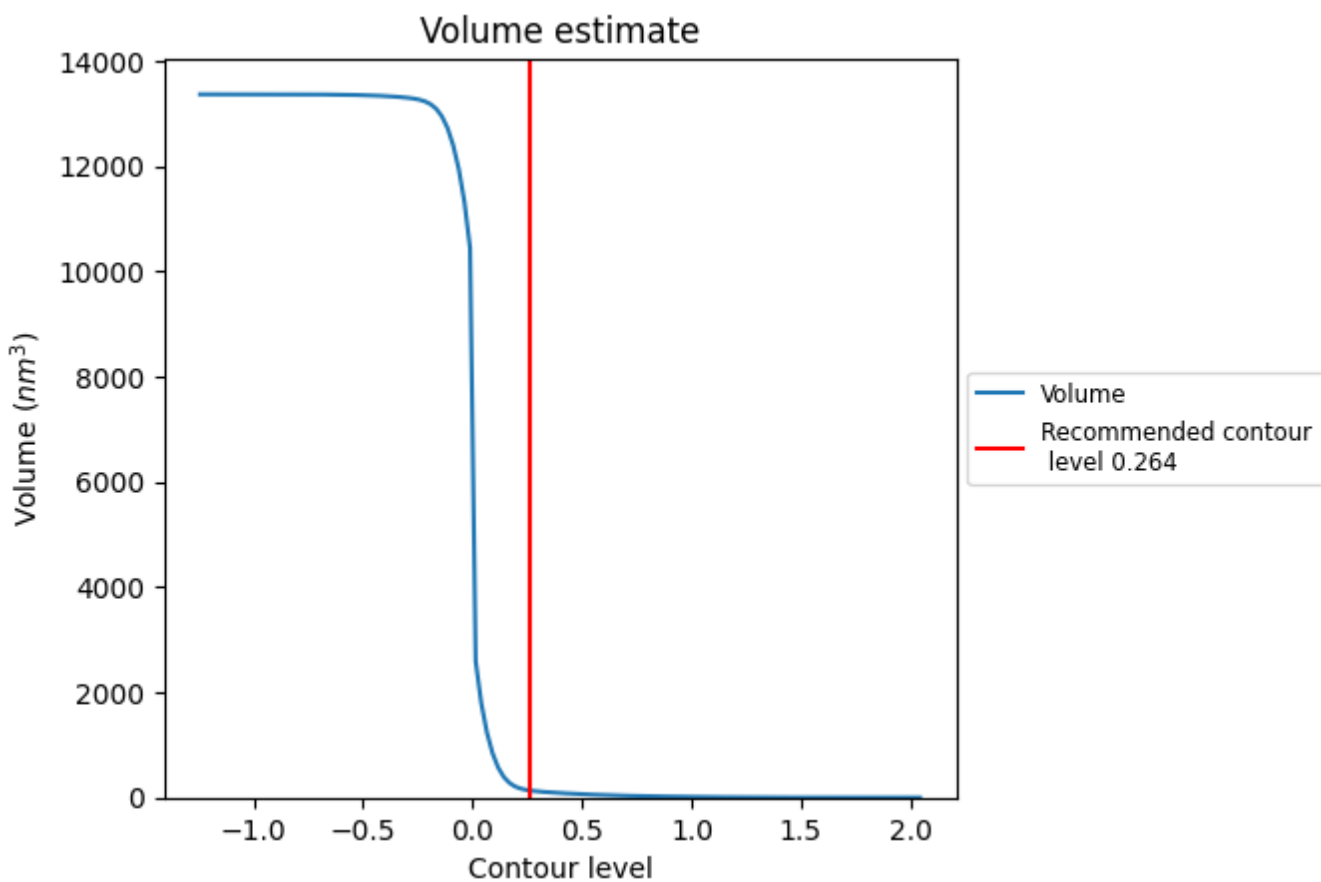
This section contains the results of statistical analysis of the map.

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.

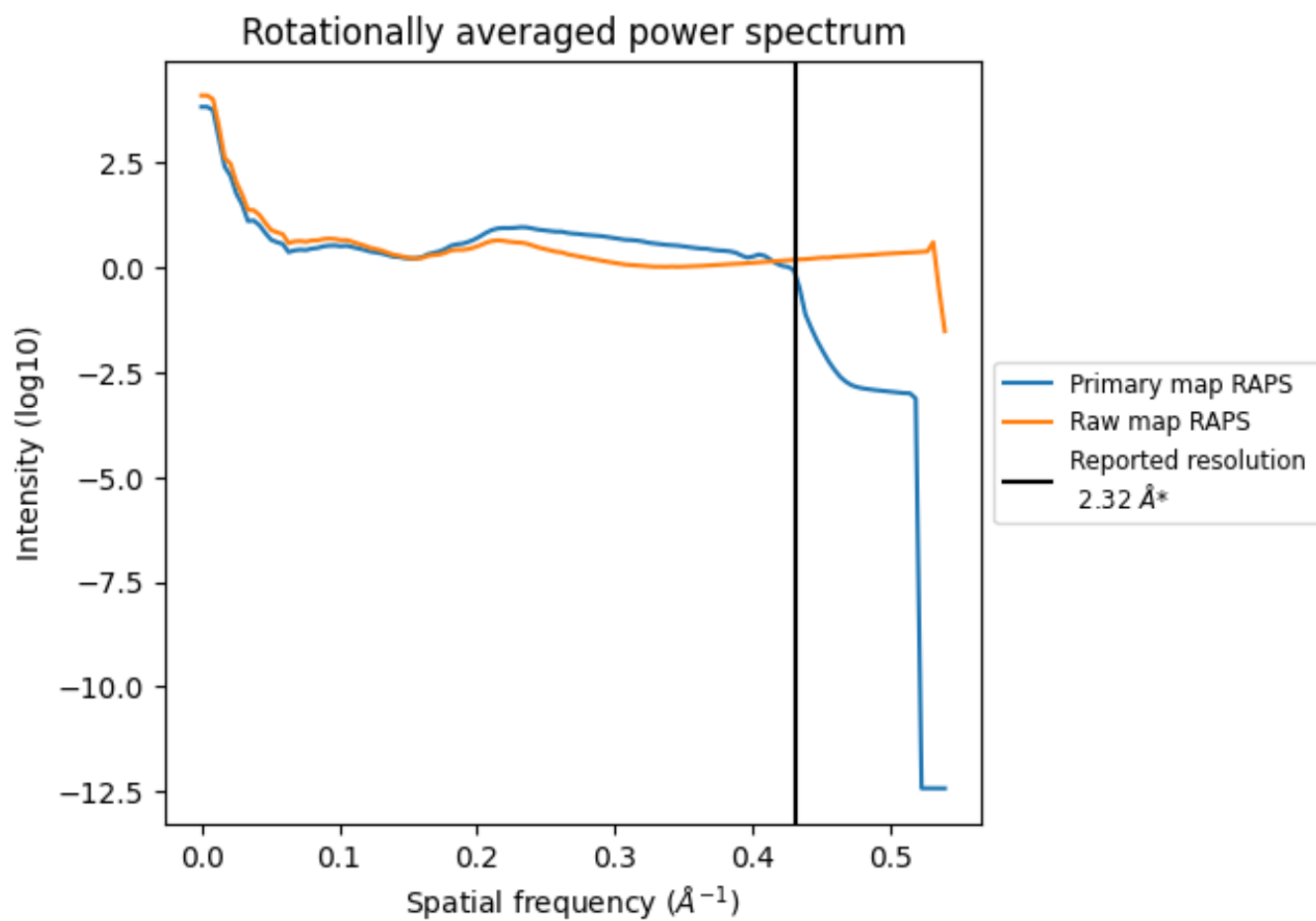
7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 134 nm³; this corresponds to an approximate mass of 121 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 0.431 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 0.431\AA^{-1}

8.2 Resolution estimates [i](#)

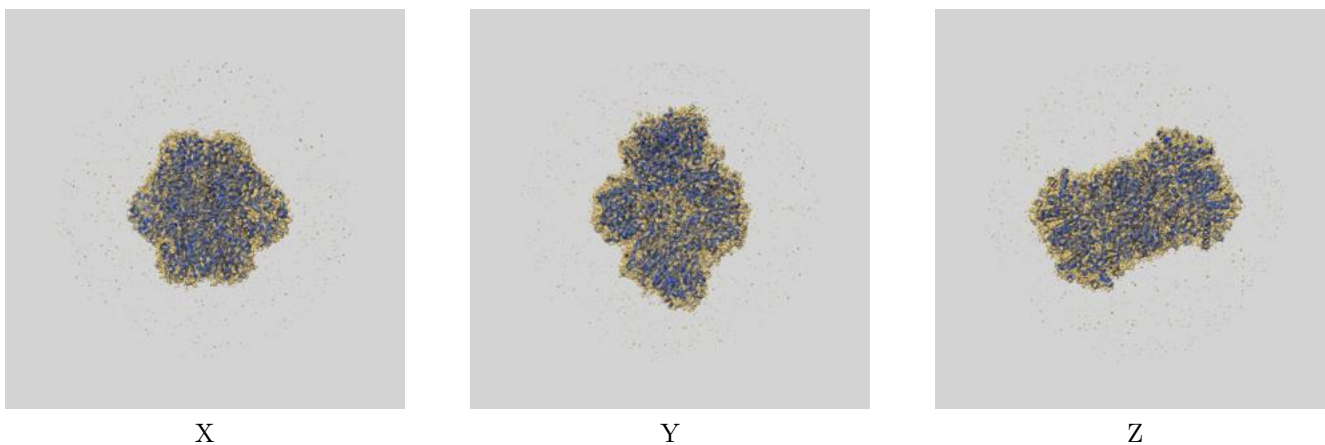
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.32	-	-
Author-provided FSC curve	2.32	2.70	2.36
Unmasked-calculated*	3.08	3.64	3.14

*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 3.08 differs from the reported value 2.32 by more than 10 %

9 Map-model fit [i](#)

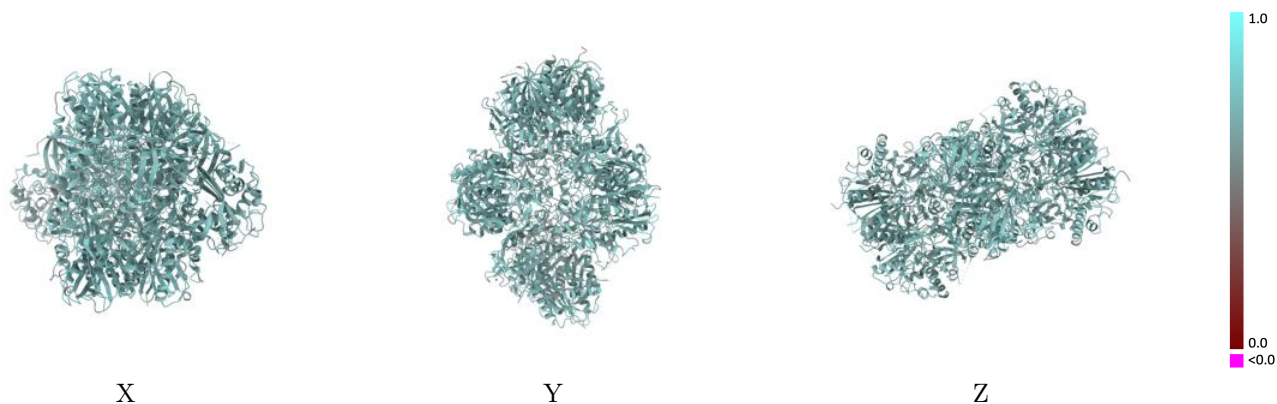
This section contains information regarding the fit between EMDB map EMD-64933 and PDB model 9VBT. Per-residue inclusion information can be found in section 3 on page 7.

9.1 Map-model overlay [i](#)



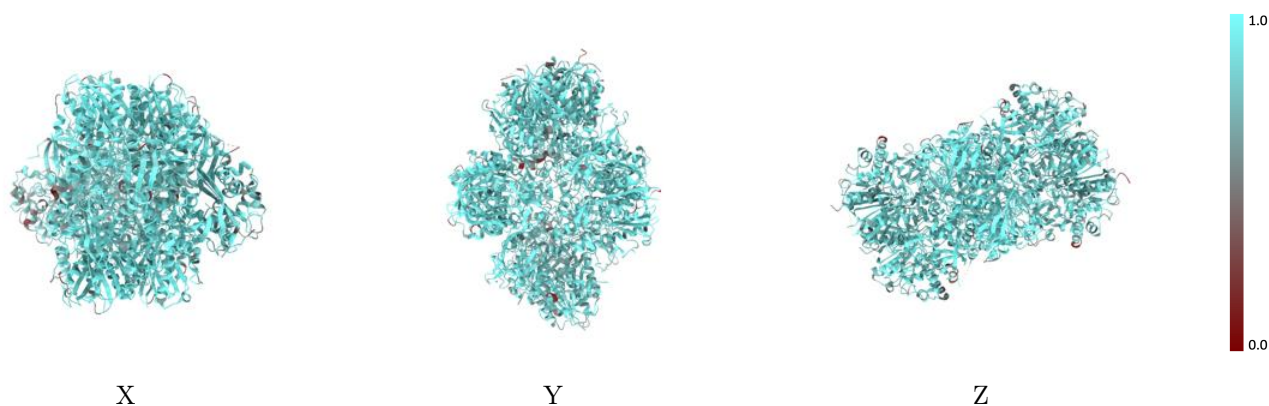
The images above show the 3D surface view of the map at the recommended contour level 0.264 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



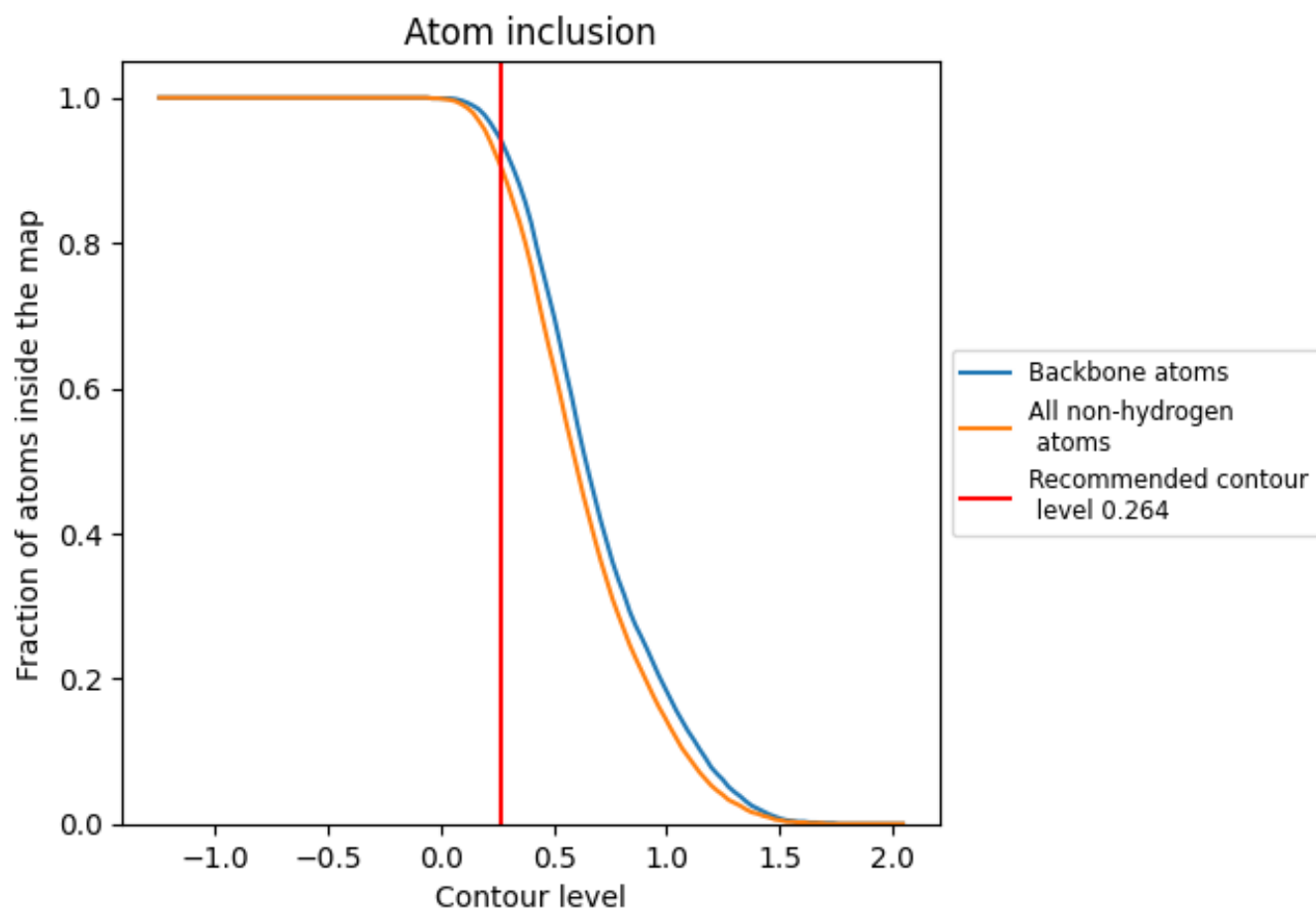
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.264).



























9.4 Atom inclusion [i](#)



At the recommended contour level, 94% of all backbone atoms, 91% 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 (0.264) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.9060	 0.6760
A	 0.9500	 0.6920
B	 0.9510	 0.6900
C	 0.9570	 0.6920
D	 0.9500	 0.6910
E	 0.8610	 0.6620
F	 0.8450	 0.6630
G	 0.9230	 0.6800
H	 0.9190	 0.6790
I	 0.8650	 0.6600
J	 0.8510	 0.6600
K	 0.9300	 0.6740
L	 0.9210	 0.6760

