



wwPDB EM Validation Summary Report ⓘ

Nov 9, 2023 – 12:13 PM JST

PDB ID : 8JOL
EMDB ID : EMD-36459
Title : cryo-EM structure of the CED-4/CED-3 holoenzyme
Authors : Li, Y.; Tian, L.; Zhang, Y.; Shi, Y.
Deposited on : 2023-06-07
Resolution : 3.00 Å (reported)

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.dev70
Mogul : 1.8.5 (274361), CSD as541be (2020)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
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) : 2.36

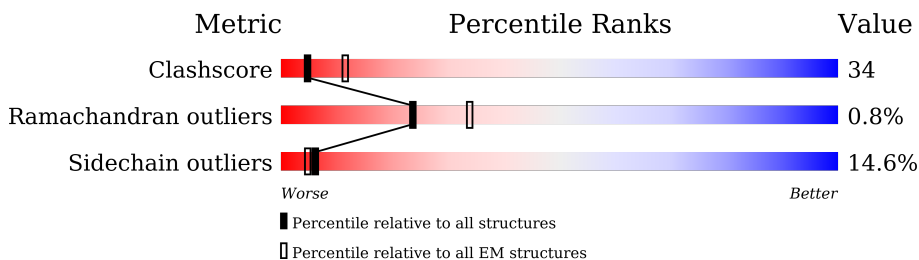
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.00 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	158937	4297
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	549	
1	B	549	
2	C	503	

2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 8513 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 Cell death protein 4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	503	4039	2575	676	759	29	0	0
1	B	494	3965	2528	663	745	29	0	0

- Molecule 2 is a protein called Cell death protein 3.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
2	C	90	445	265	90	90	0	0

- Molecule 3 is MAGNESIUM ION (three-letter code: MG) (formula: Mg) (labeled as "Ligand of Interest" by depositor).

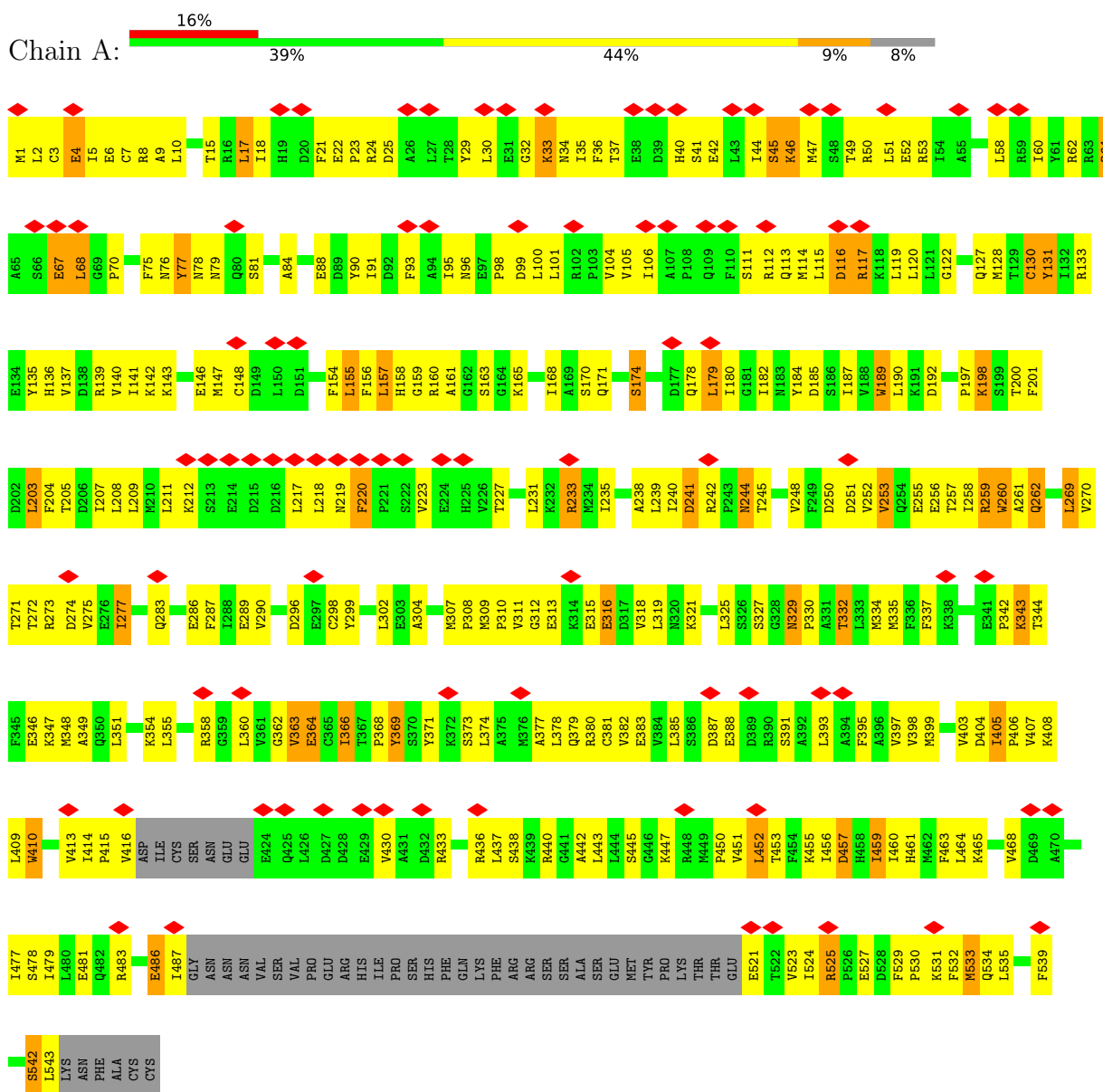
Mol	Chain	Residues	Atoms		AltConf
			Total	Mg	
3	A	1	1	1	0
3	B	1	1	1	0

- Molecule 4 is ADENOSINE-5'-TRIPHOSPHATE (three-letter code: ATP) (formula: C₁₀H₁₆N₅O₁₃P₃) (labeled as "Ligand of Interest" by depositor).

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: Cell death protein 4



- Molecule 1: Cell death protein 4

PRO ARG
GLY MET
CYS LEU
ILE ILE
ASN ASN
GLU GLU
PHE HIS
GLU PHE
GLN GLU
MET MET
PRO THR
ARG THR
ASN ARG
ASN ASN
GLY ILE
THR THR
LYS LYS
ALA ALA
ASP ASP
LYS LYS

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

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

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

MET
PRO
GLU
MET
THR
SER
ARG
LEU
LEU
LYS
LYS
PHE
TYR
PHE
TRP
PRO
GLU
ALA
ARG
ASN
SER
SER
ALA
VAL

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	115378	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 ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	1500	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.074	Depositor
Minimum map value	-0.018	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.002	Depositor
Recommended contour level	0.02	Depositor
Map size (Å)	337.92, 337.92, 337.92	wwPDB
Map dimensions	256, 256, 256	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.32, 1.32, 1.32	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: ATP, MG

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	0.44	0/4113	0.60	0/5558
1	B	0.41	0/4037	0.59	0/5452
2	C	0.41	0/444	0.56	1/617 (0.2%)
All	All	0.42	0/8594	0.59	1/11627 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	90	PRO	N-CA-CB	6.04	110.54	103.30

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	A	4039	0	4066	295	0
1	B	3965	0	3987	271	0
2	C	445	0	204	2	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
4	A	31	0	12	6	0
4	B	31	0	12	4	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
All	All	8513	0	8281	564	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 34.

The worst 5 of 564 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:93:PHE:HE2	1:A:100:LEU:HD23	1.24	1.01
1:A:41:SER:O	1:A:45:SER:HB3	1.61	1.01
1:B:41:SER:O	1:B:45:SER:HB3	1.62	0.99
1:A:262:GLN:HE21	1:A:283:GLN:HB2	1.30	0.96
1:A:8:ARG:HG2	1:A:8:ARG:HH11	1.33	0.94

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	497/549 (90%)	430 (86%)	64 (13%)	3 (1%)	25	64
1	B	486/549 (88%)	422 (87%)	59 (12%)	5 (1%)	15	53
2	C	88/503 (18%)	78 (89%)	9 (10%)	1 (1%)	14	50
All	All	1071/1601 (67%)	930 (87%)	132 (12%)	9 (1%)	24	57

5 of 9 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	77	TYR
1	B	76	ASN
1	B	357	SER

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Mol	Chain	Res	Type
1	B	468	VAL
1	A	260	TRP

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	458/501 (91%)	389 (85%)	69 (15%)	3 14
1	B	449/501 (90%)	386 (86%)	63 (14%)	3 16
All	All	907/1002 (90%)	775 (85%)	132 (15%)	6 15

5 of 132 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	404	ASP
1	B	437	LEU
1	B	542	SER
1	A	363	VAL
1	A	360	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 20 such sidechains are listed below:

Mol	Chain	Res	Type
1	B	219	ASN
1	B	471	GLN
1	B	534	GLN
1	B	482	GLN
1	A	471	GLN

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](#)

Of 4 ligands modelled in this entry, 2 are monoatomic - leaving 2 for Mogul analysis.

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
4	ATP	A	602	3	26,33,33	1.11	2 (7%)	31,52,52	1.91	10 (32%)
4	ATP	B	602	3	26,33,33	1.07	2 (7%)	31,52,52	1.88	11 (35%)

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
4	ATP	A	602	3	-	5/18/38/38	0/3/3/3
4	ATP	B	602	3	-	9/18/38/38	0/3/3/3

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	602	ATP	C5-C4	2.94	1.48	1.40
4	B	602	ATP	C5-C4	2.86	1.48	1.40
4	A	602	ATP	O4'-C1'	2.83	1.45	1.41
4	B	602	ATP	C2-N3	2.09	1.35	1.32

The worst 5 of 21 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	602	ATP	PB-O3B-PG	-5.45	114.14	132.83
4	B	602	ATP	PA-O3A-PB	-4.00	119.12	132.83
4	A	602	ATP	C3'-C2'-C1'	3.70	106.55	100.98
4	B	602	ATP	N6-C6-N1	3.53	125.91	118.57
4	A	602	ATP	PA-O3A-PB	-3.26	121.64	132.83

There are no chirality outliers.

5 of 14 torsion outliers are listed below:

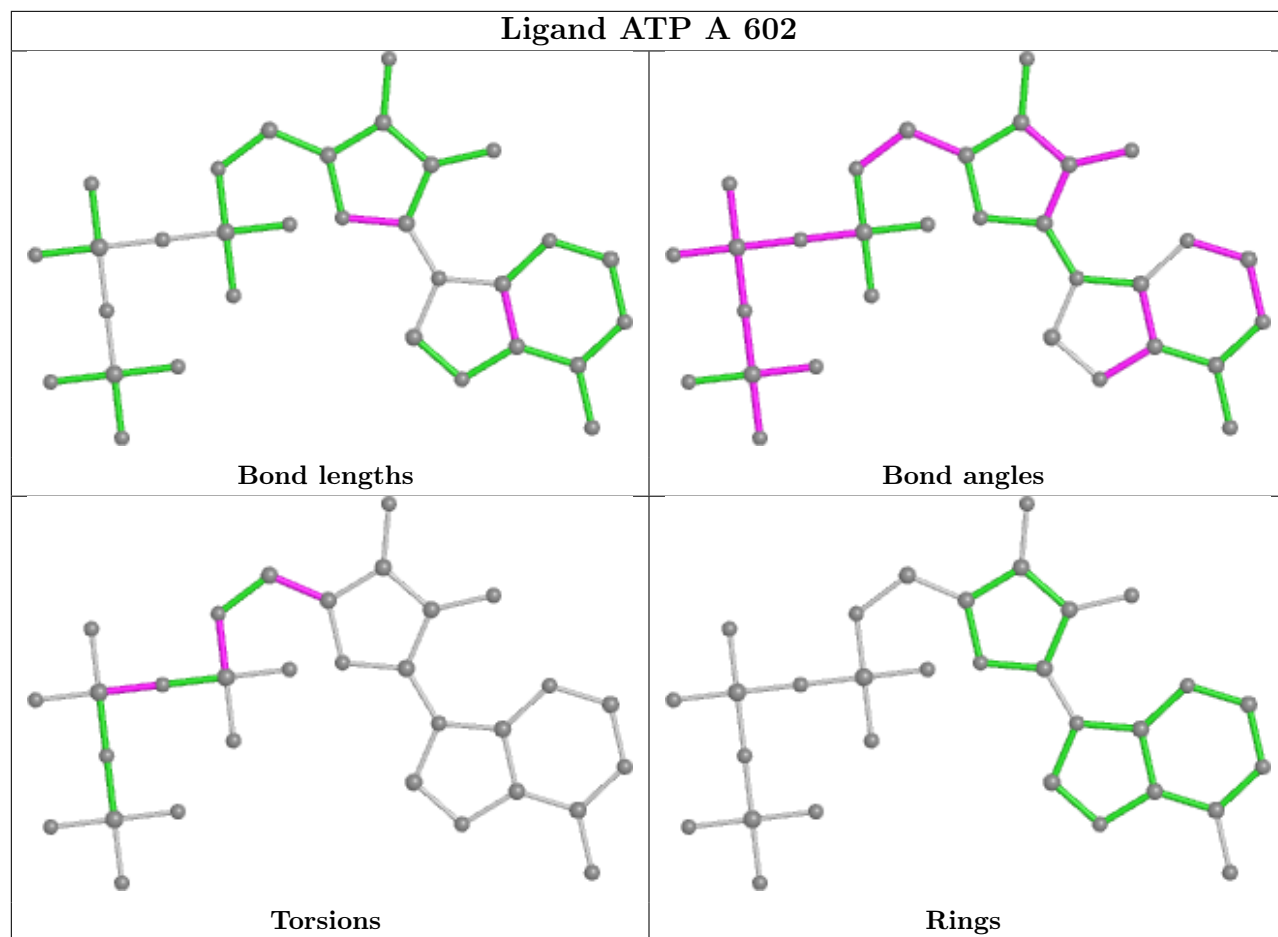
Mol	Chain	Res	Type	Atoms
4	A	602	ATP	C5'-O5'-PA-O3A
4	A	602	ATP	O4'-C4'-C5'-O5'
4	A	602	ATP	C3'-C4'-C5'-O5'
4	B	602	ATP	C5'-O5'-PA-O1A
4	B	602	ATP	C3'-C4'-C5'-O5'

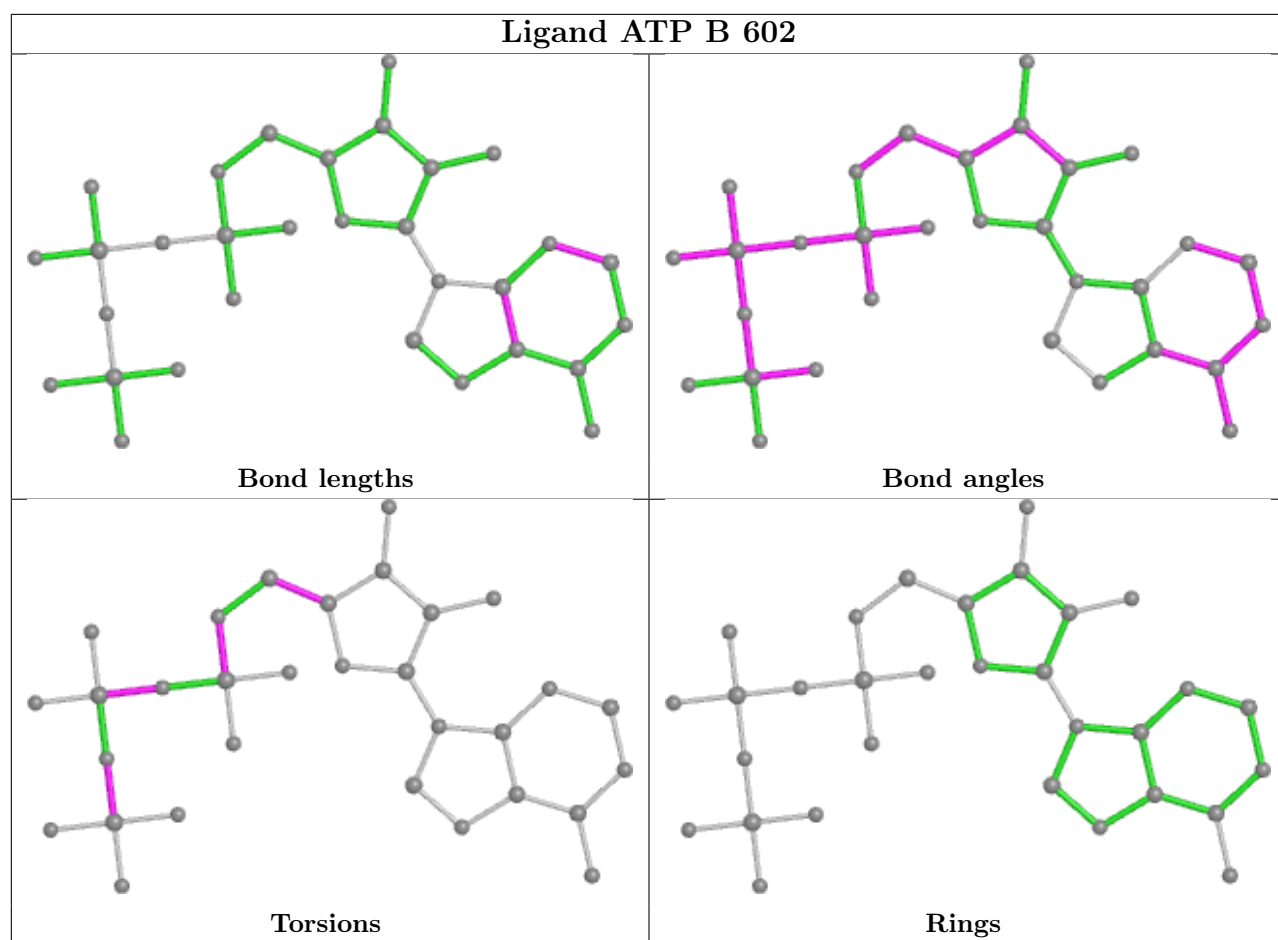
There are no ring outliers.

2 monomers are involved in 10 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	602	ATP	6	0
4	B	602	ATP	4	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.





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.

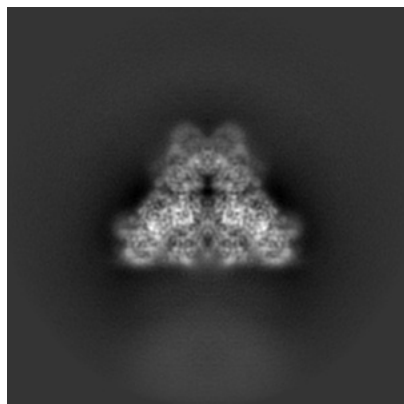
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-36459. These allow visual inspection of the internal detail of the map and identification of artifacts.

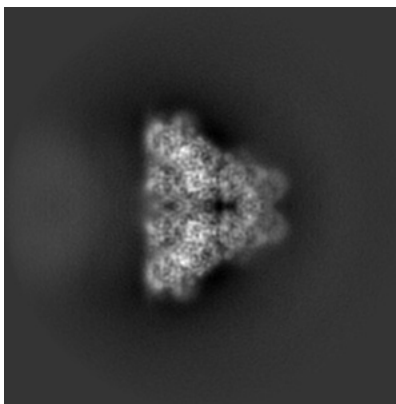
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

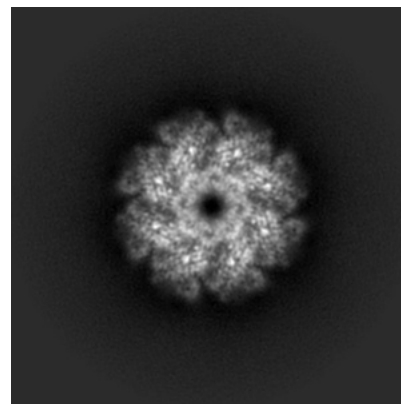
6.1.1 Primary map



X

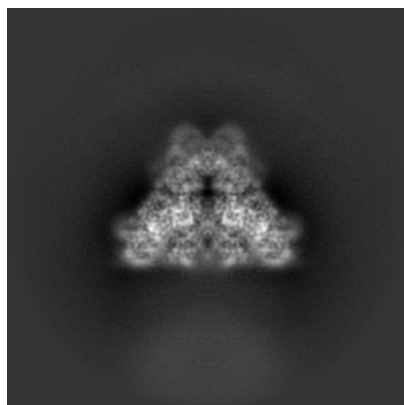


Y

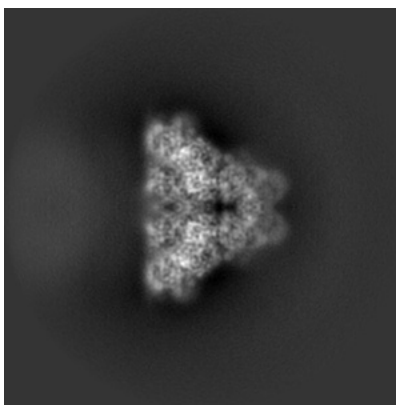


Z

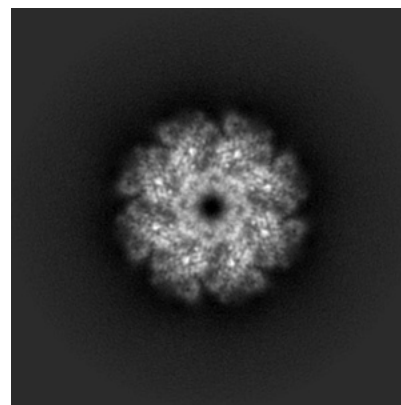
6.1.2 Raw map



X



Y

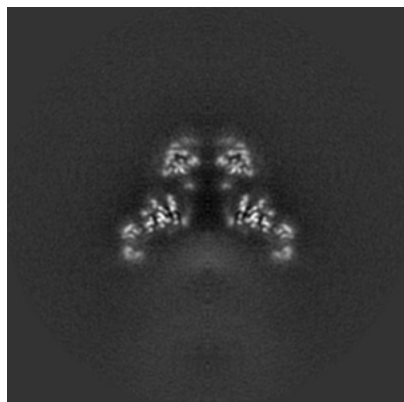


Z

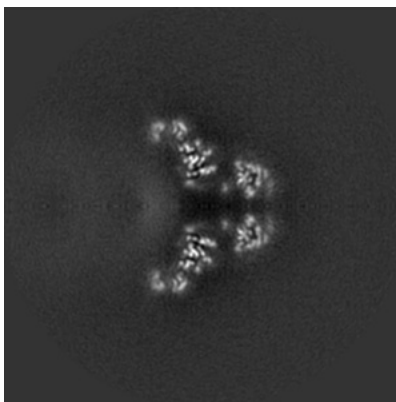
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

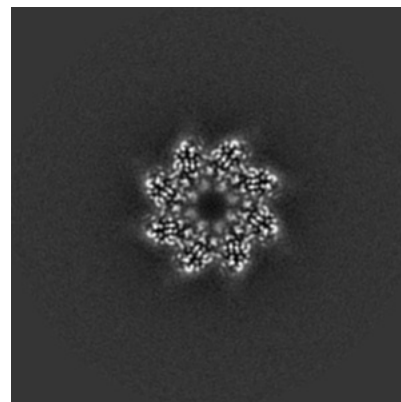
6.2.1 Primary map



X Index: 128

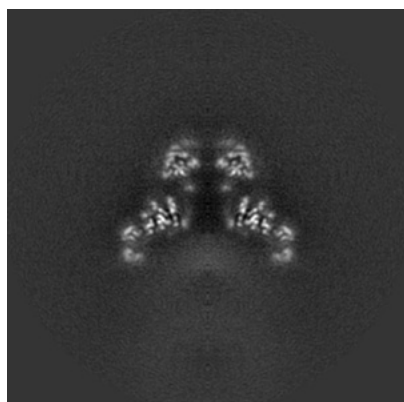


Y Index: 128

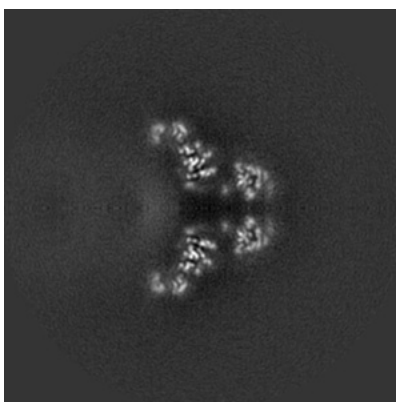


Z Index: 128

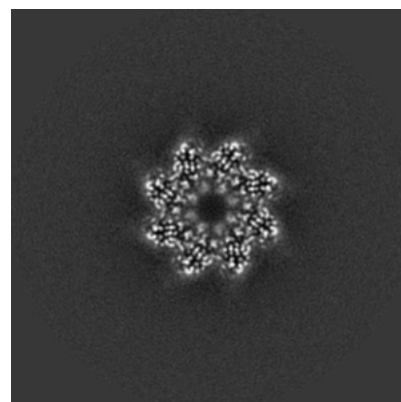
6.2.2 Raw map



X Index: 128



Y Index: 128

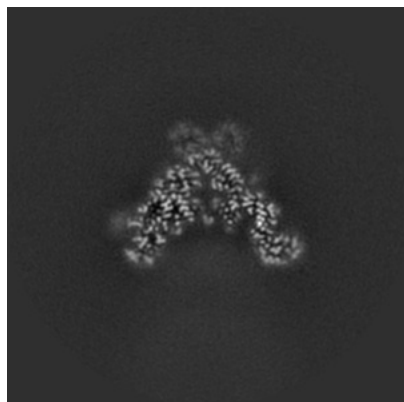


Z Index: 128

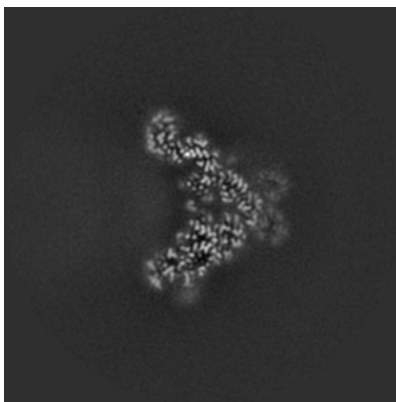
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

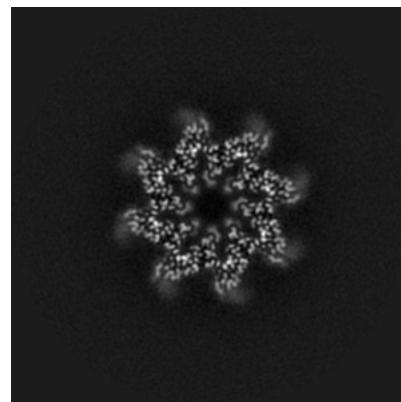
6.3.1 Primary map



X Index: 144

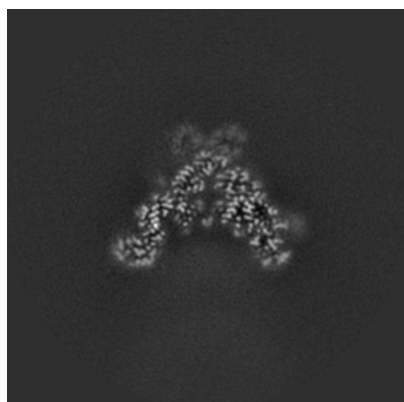


Y Index: 112

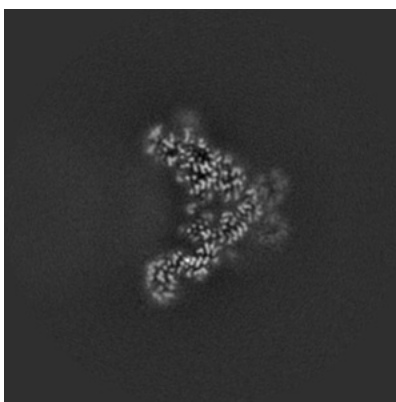


Z Index: 118

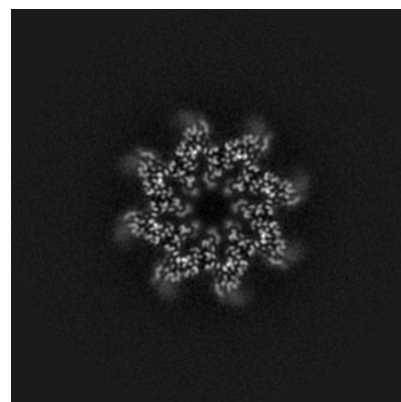
6.3.2 Raw map



X Index: 112



Y Index: 144

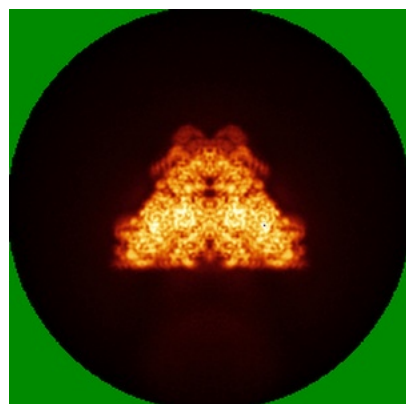


Z Index: 118

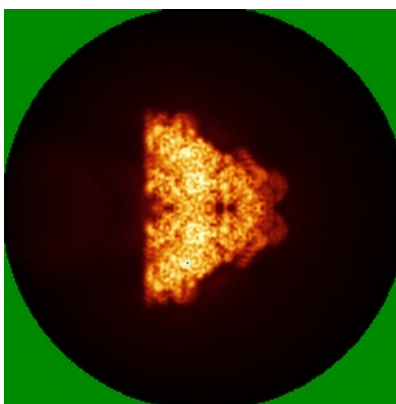
The images above show the largest variance slices of the map in three orthogonal directions.

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

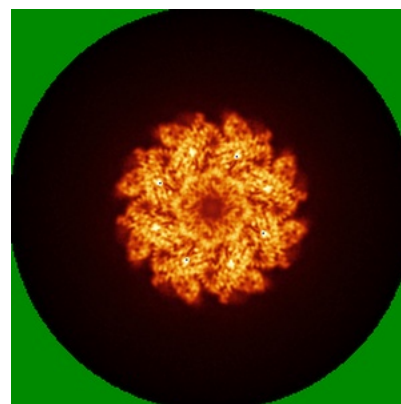
6.4.1 Primary map



X

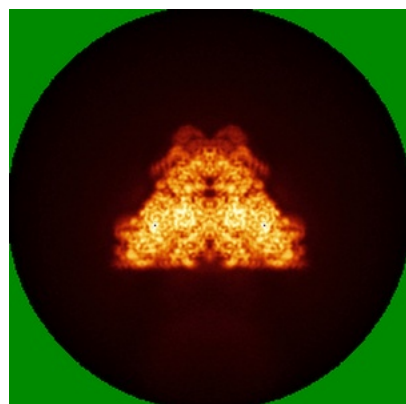


Y

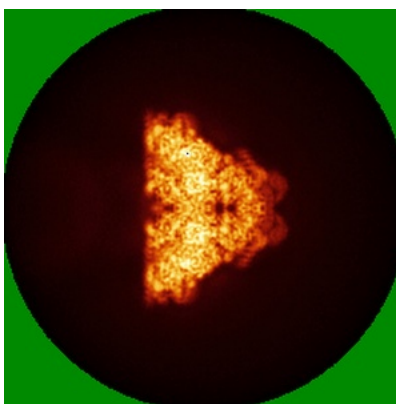


Z

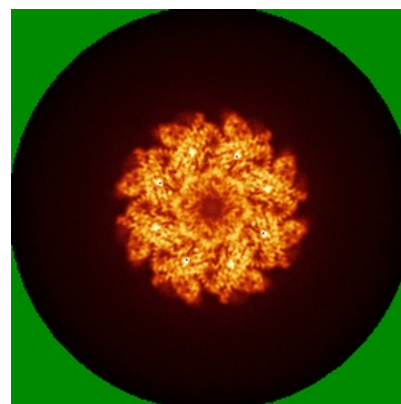
6.4.2 Raw map



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.

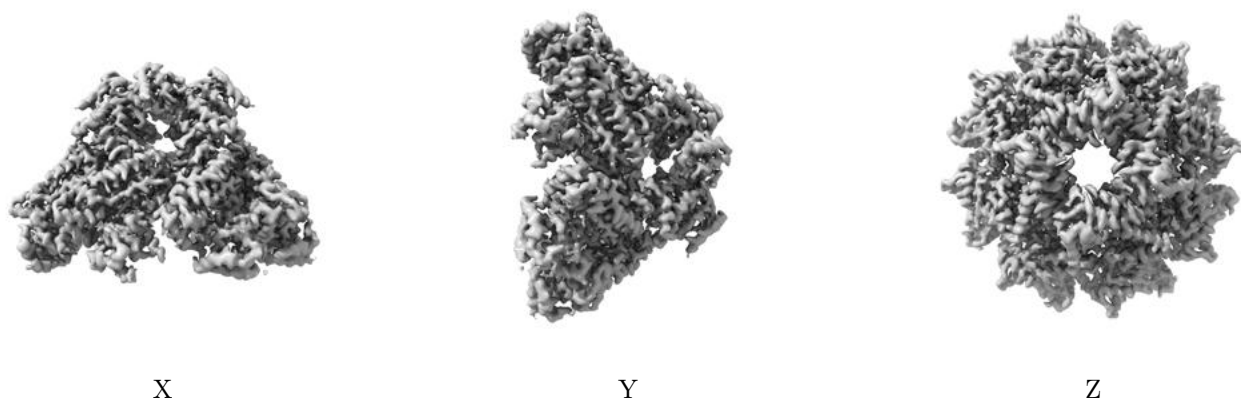
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.02. 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.

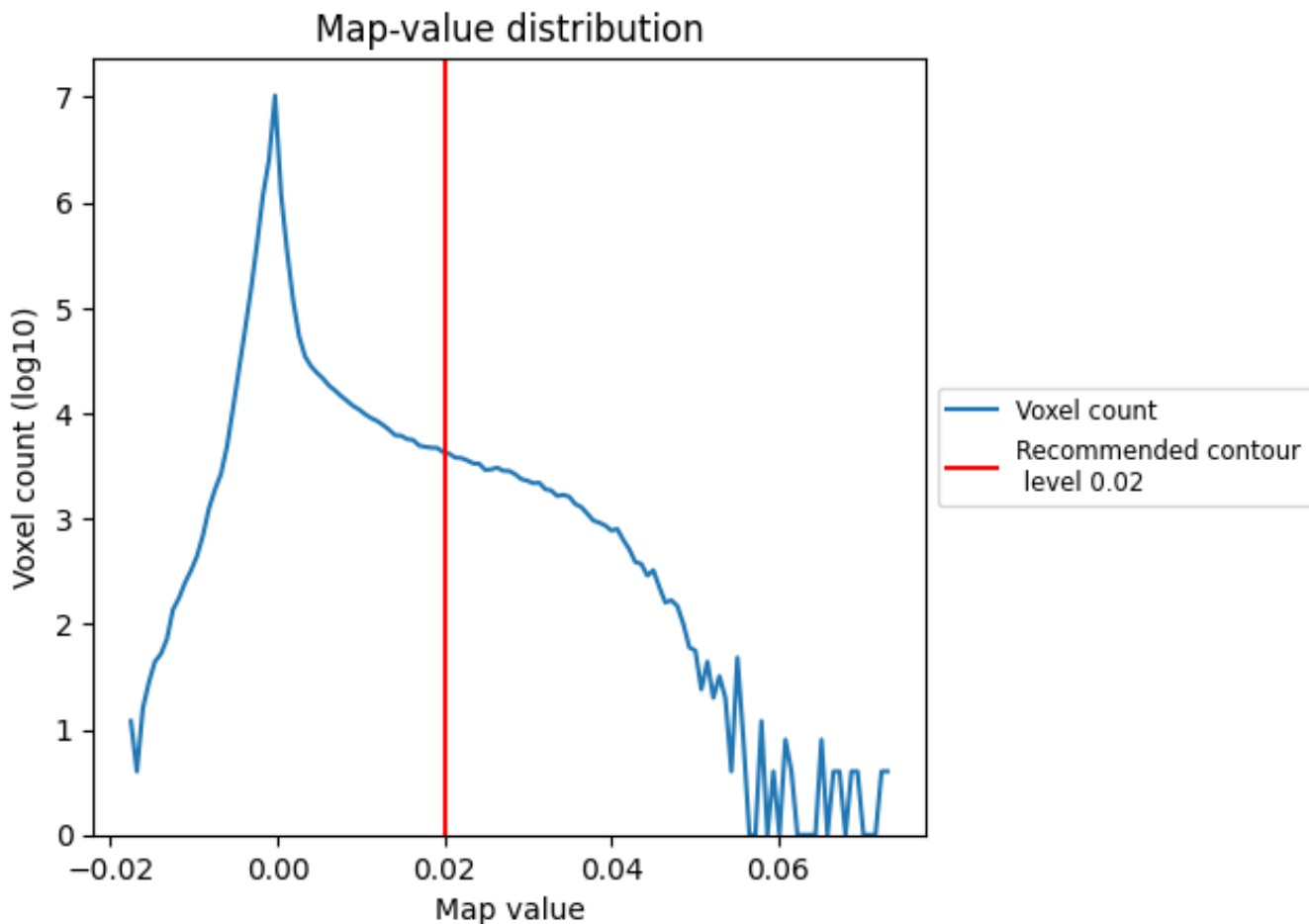
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

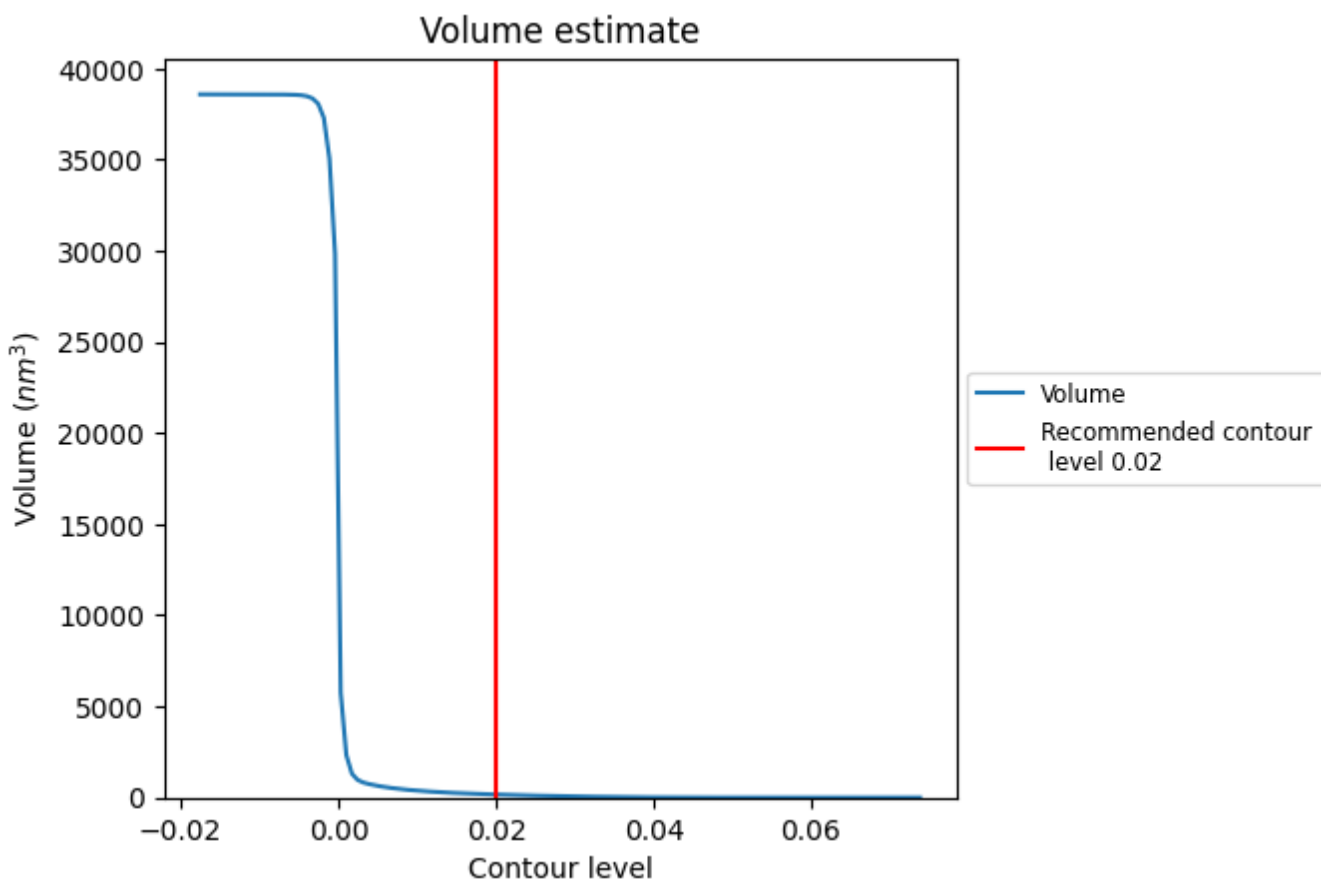
This section contains the results of statistical analysis of the map.

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.

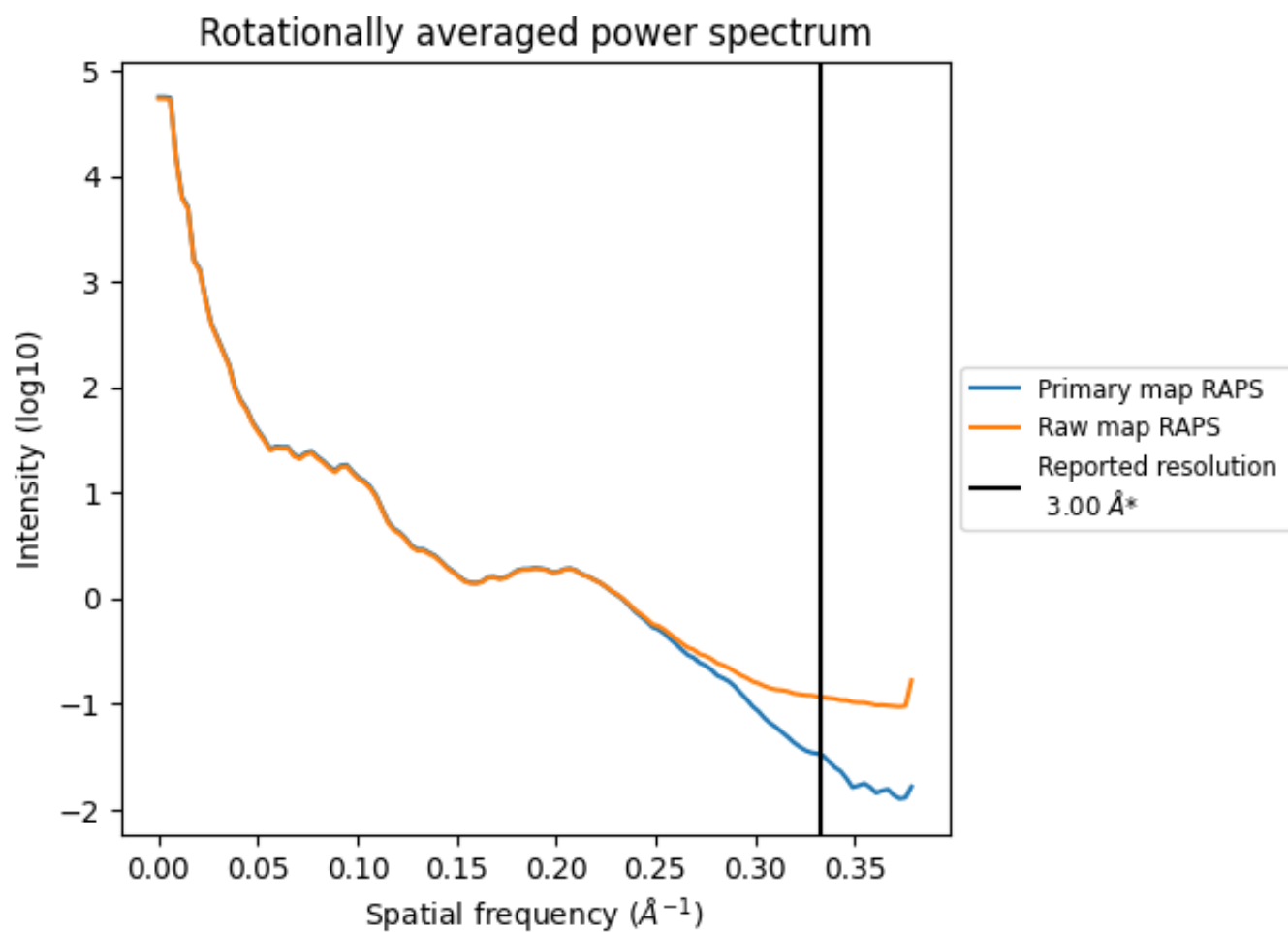
7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 166 nm³; this corresponds to an approximate mass of 150 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

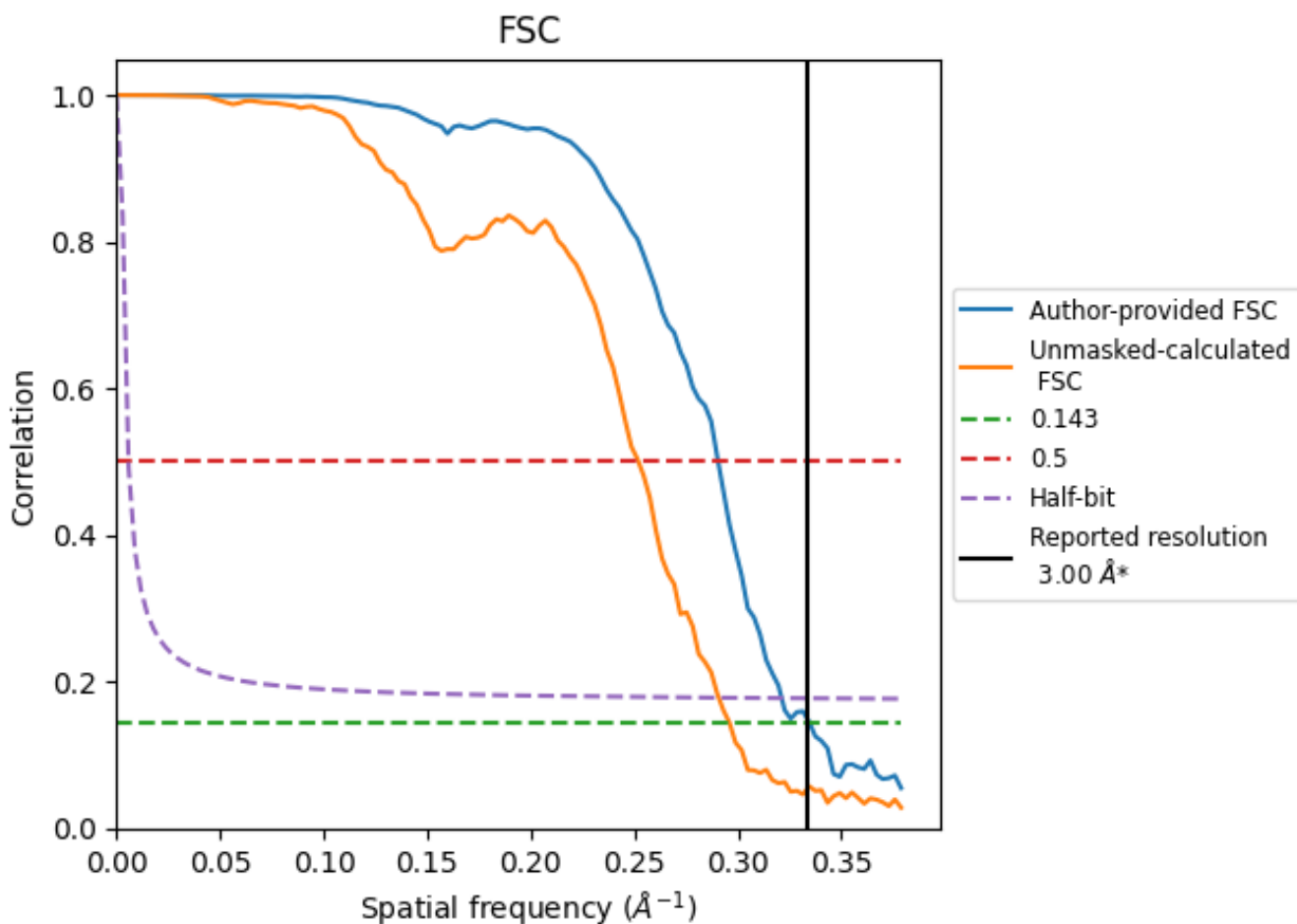


*Reported resolution corresponds to spatial frequency of 0.333 \AA^{-1}

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 0.333 Å⁻¹

8.2 Resolution estimates [i](#)

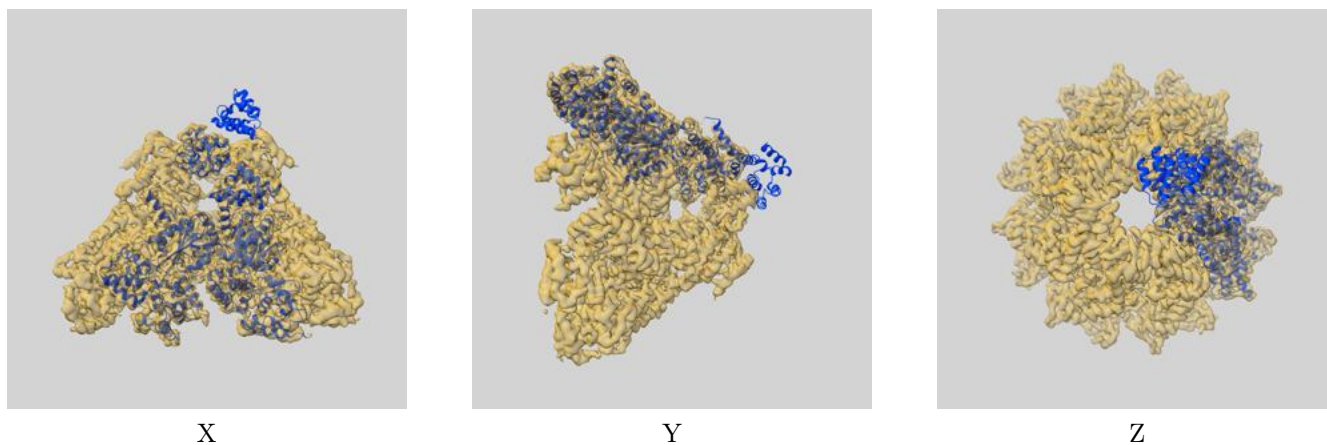
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.00	-	-
Author-provided FSC curve	2.99	3.44	3.11
Unmasked-calculated*	3.38	3.97	3.44

*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 3.38 differs from the reported value 3.0 by more than 10 %

9 Map-model fit [i](#)

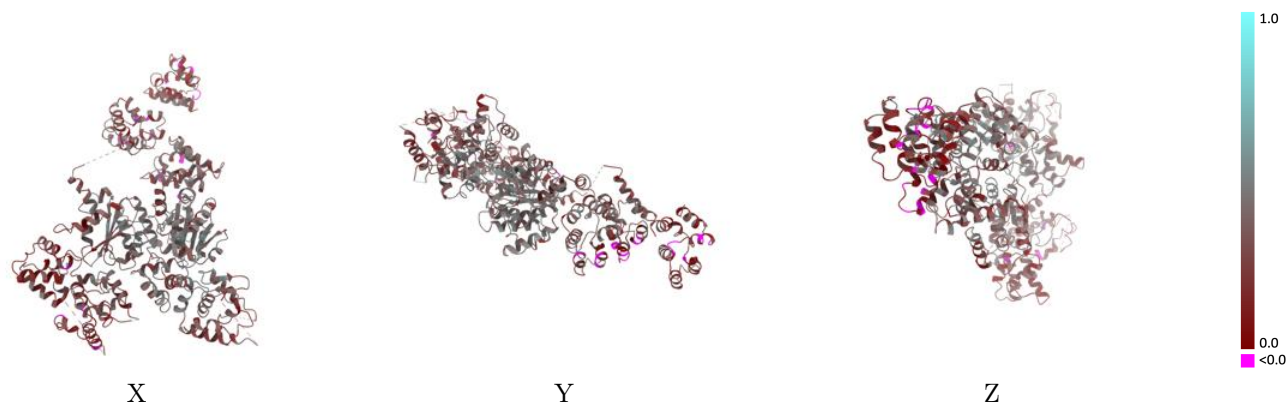
This section contains information regarding the fit between EMDB map EMD-36459 and PDB model 8JOL. Per-residue inclusion information can be found in section 3 on page 5.

9.1 Map-model overlay [i](#)



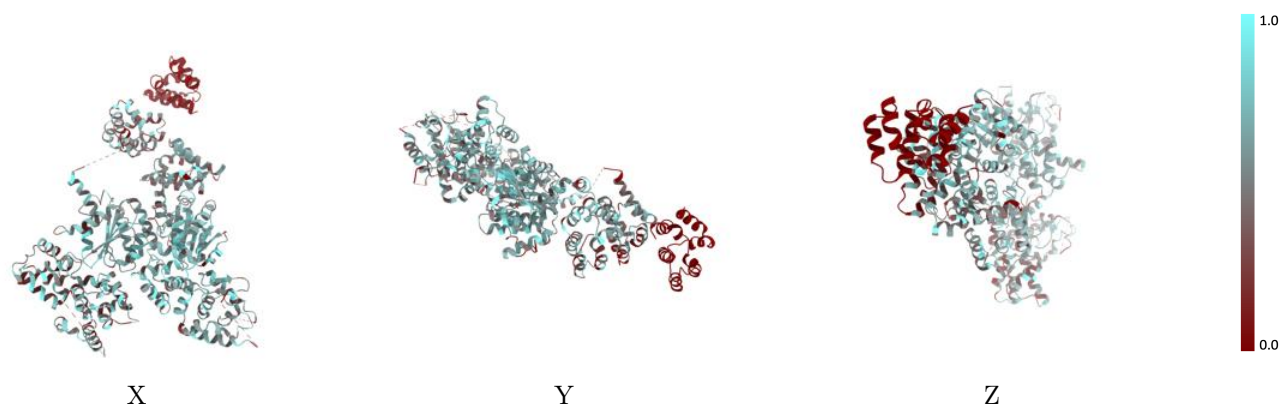
The images above show the 3D surface view of the map at the recommended contour level 0.02 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



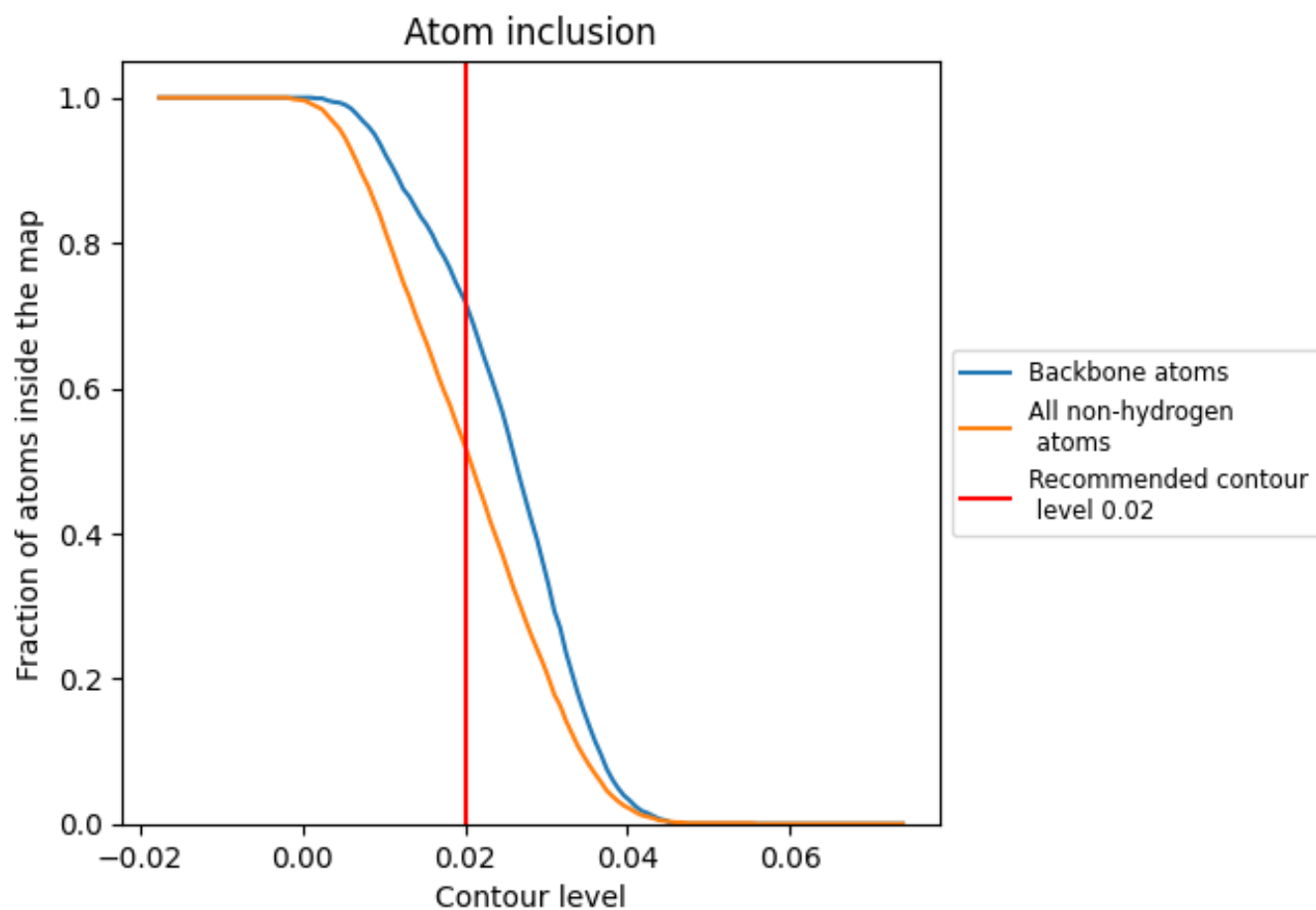
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.02).









9.4 Atom inclusion [i](#)



At the recommended contour level, 72% of all backbone atoms, 52% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary [i](#)

The table lists the average atom inclusion at the recommended contour level (0.02) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.5210	 0.3250
A	 0.5820	 0.3670
B	 0.5190	 0.2950
C	 0.0000	 0.2160

