W O R L D W I D E
wwPDB
P R O T E I N   D A T A   B A N K

wwPDB EM Validation Summary Report (i)

May 27, 2024 – 06:09 PM EDT

PDB ID	:	5A3E
EMDB ID	:	EMD-6342
Title	:	2.5A structure of lysozyme determined by MicroED with data from a single crystal
Authors	:	Nannenga, B.L.; Shi, D.; Leslie, A.G.W.; Gonen, T.
Deposited on	:	2015-05-28
Resolution	:	2.50 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 (i) 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 (i)) were used in the production of this report:

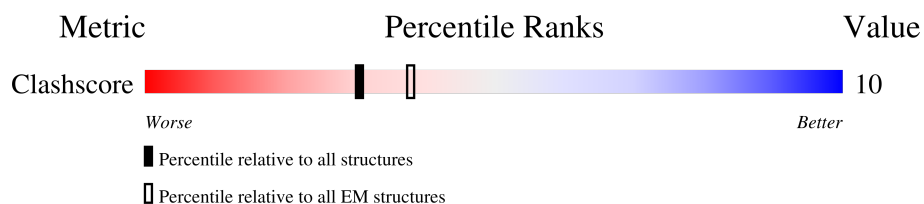|		
EMDB validation analysis	:	0.0.1.dev92
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36.2

1   Overall quality at a glance ⓘ

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

The reported resolution of this entry is 2.50 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	Percentile Ranks	Value
Clashscore		10

Worse   *Better*

▮ Percentile relative to all structures

◻ Percentile relative to all EM structures

Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297

2 Entry composition (i)

There are 2 unique types of molecules in this entry. The entry contains 1002 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 LYSOZYME C.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	128	Total 992	C 607	N 192	O 183	S 10	0	0

- Molecule 2 is water.

Mol	Chain	Residues	Atoms		AltConf
2	A	10	Total 10	O 10	0

SEQUENCE-PLOTS INFOmissingINFO

3 Experimental information ⓘ

Property	Value	Source
EM reconstruction method	CRYSTALLOGRAPHY	Depositor
Imposed symmetry	3D CRYSTAL, a=Not provided Å, b=Not provided Å, c=Not provided Å, α=Not provided°, β=Not provided°, γ=Not provided°, space group=Not provided	Depositor
Number of images used	Not provided	
Resolution determination method	Not provided	
CTF correction method	Not provided	
Microscope	FEI TECNAI F20	Depositor
Voltage (kV)	200	Depositor
Electron dose $(e^-/Å^2)$	Not provided	
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GENERIC CCD	Depositor
Maximum map value	5.176	Depositor
Minimum map value	-3.217	Depositor
Average map value	0.000	Depositor
Map value standard deviation	1.000	Depositor
Recommended contour level	1.6	Depositor
Map size (Å)	75.8899, 75.8899, 36.93	wwPDB
Map dimensions	45, 96, 96	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.7905198, 0.7905198, 0.8206667	Depositor

4 Model quality ⓘ

4.1 Standard geometry ⓘ

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	0.23	0/1012	0.41	0/1368

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

4.2 Too-close contacts ⓘ

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	992	0	948	19	5
2	A	10	0	0	6	0
All	All	1002	0	948	19	5

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 10.

The worst 5 of 19 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:71:GLY:O	2:A:1007:HOH:O	1.97	0.80
1:A:55:ILE:HG23	1:A:56:LEU:HG	1.66	0.75
1:A:121:GLN:NE2	2:A:1009:HOH:O	2.19	0.68
1:A:71:GLY:C	2:A:1007:HOH:O	2.39	0.58
1:A:33:LYS:HG2	1:A:123:TRP:CH2	2.41	0.56

All (5) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:18:ASP:OD1	1:A:128:ARG:NH2[7_554]	0.74	1.46
1:A:18:ASP:OD1	1:A:128:ARG:CZ[7_554]	1.22	0.98
1:A:18:ASP:OD1	1:A:128:ARG:NH1[7_554]	1.80	0.40
1:A:18:ASP:CG	1:A:128:ARG:NH2[7_554]	1.92	0.28
1:A:18:ASP:CG	1:A:128:ARG:NH1[7_554]	2.19	0.01

4.3 Torsion angles ⓘ

4.3.1 Protein backbone ⓘ

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

4.3.2 Protein sidechains ⓘ

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

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 monosaccharides in this entry.

4.6 Ligand geometry ⓘ

There are no ligands in this entry.

4.7 Other polymers ⓘ

There are no such residues in this entry.

4.8 Polymer linkage issues　ⓘ

There are no chain breaks in this entry.

5 Map visualisation ⓘ

This section contains visualisations of the EMDB entry EMD-6342. These allow visual inspection of the internal detail of the map and identification of artifacts.

No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.
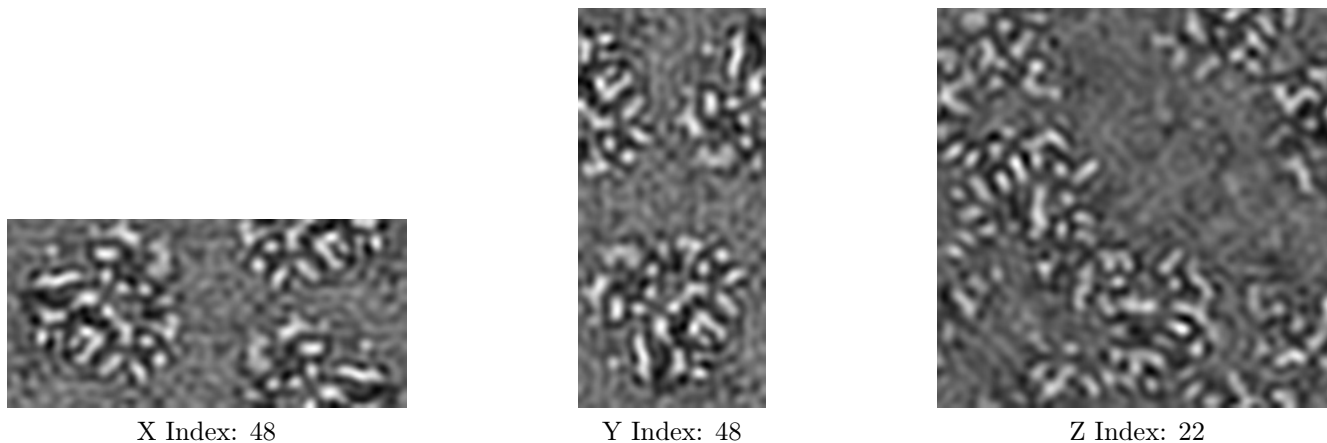
5.1 Orthogonal projections ⓘ

5.1.1 Primary map

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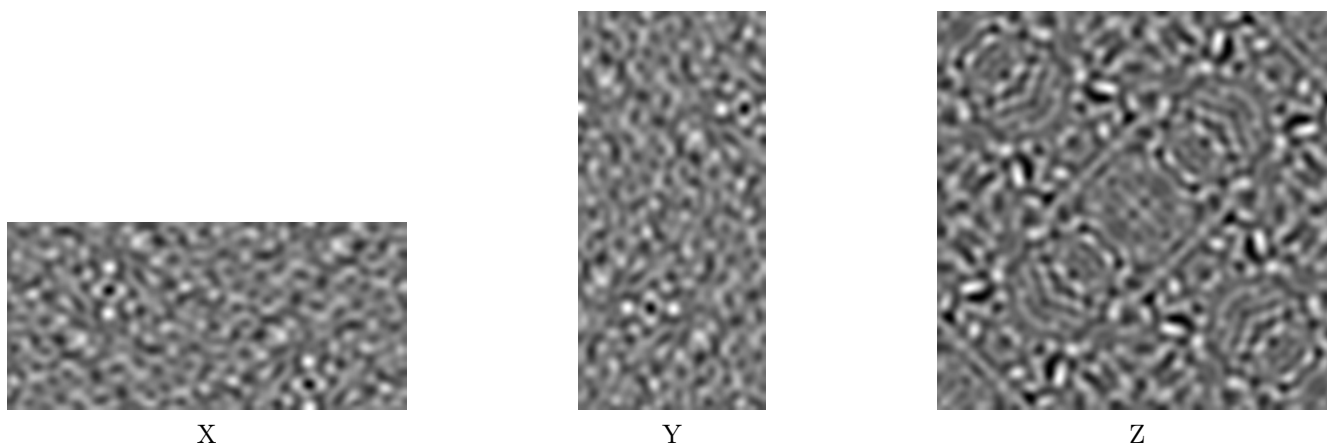
The images above show the map projected in three orthogonal directions.

5.2 Central slices ⓘ

5.2.1 Primary map

X Index: 48   Y Index: 48   Z Index: 22

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

5.3 Largest variance slices ⓘ
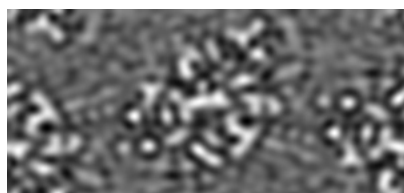
5.3.1 Primary map
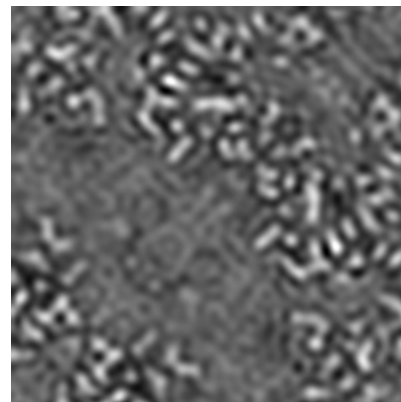
X Index: 24   Y Index: 24   Z Index: 0

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

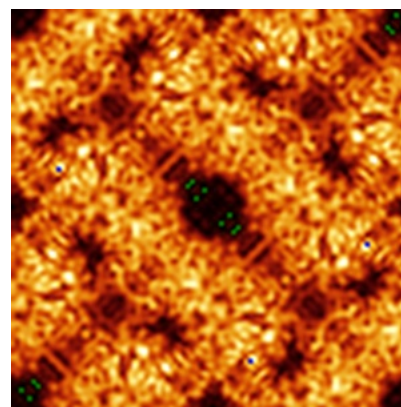## 5.4 Orthogonal standard-deviation projections (False-color) ⓘ
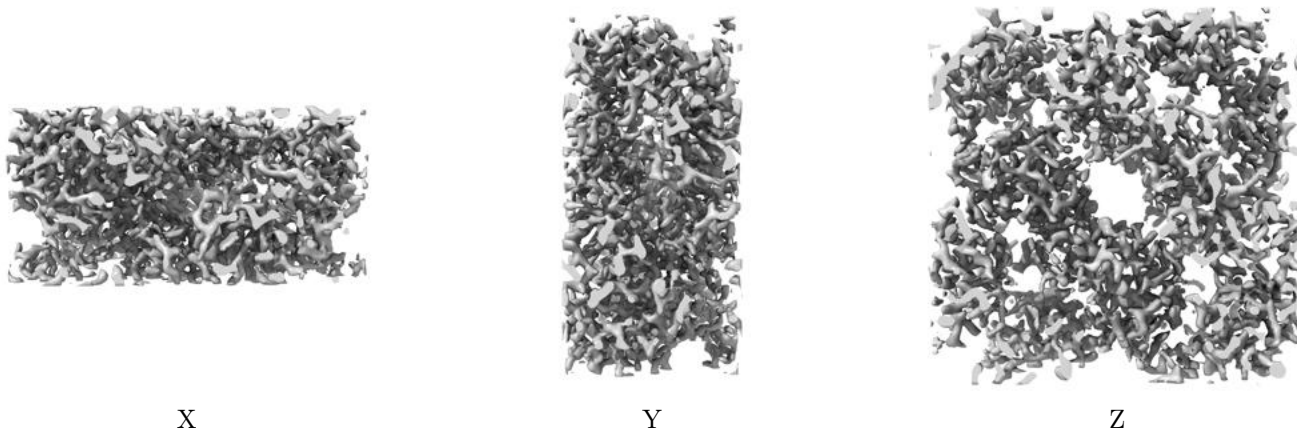
5.4.1 Primary map

X   Y   Z
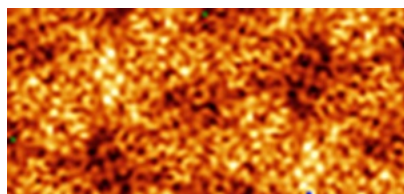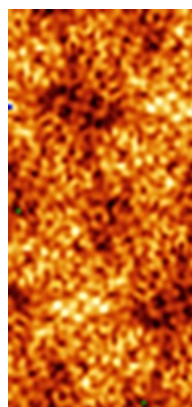
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

5.5   Orthogonal surface views ⓘ

5.5.1   Primary map

X   Y   Z

The images above show the 3D surface view of the map at the recommended contour level 1.6. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.
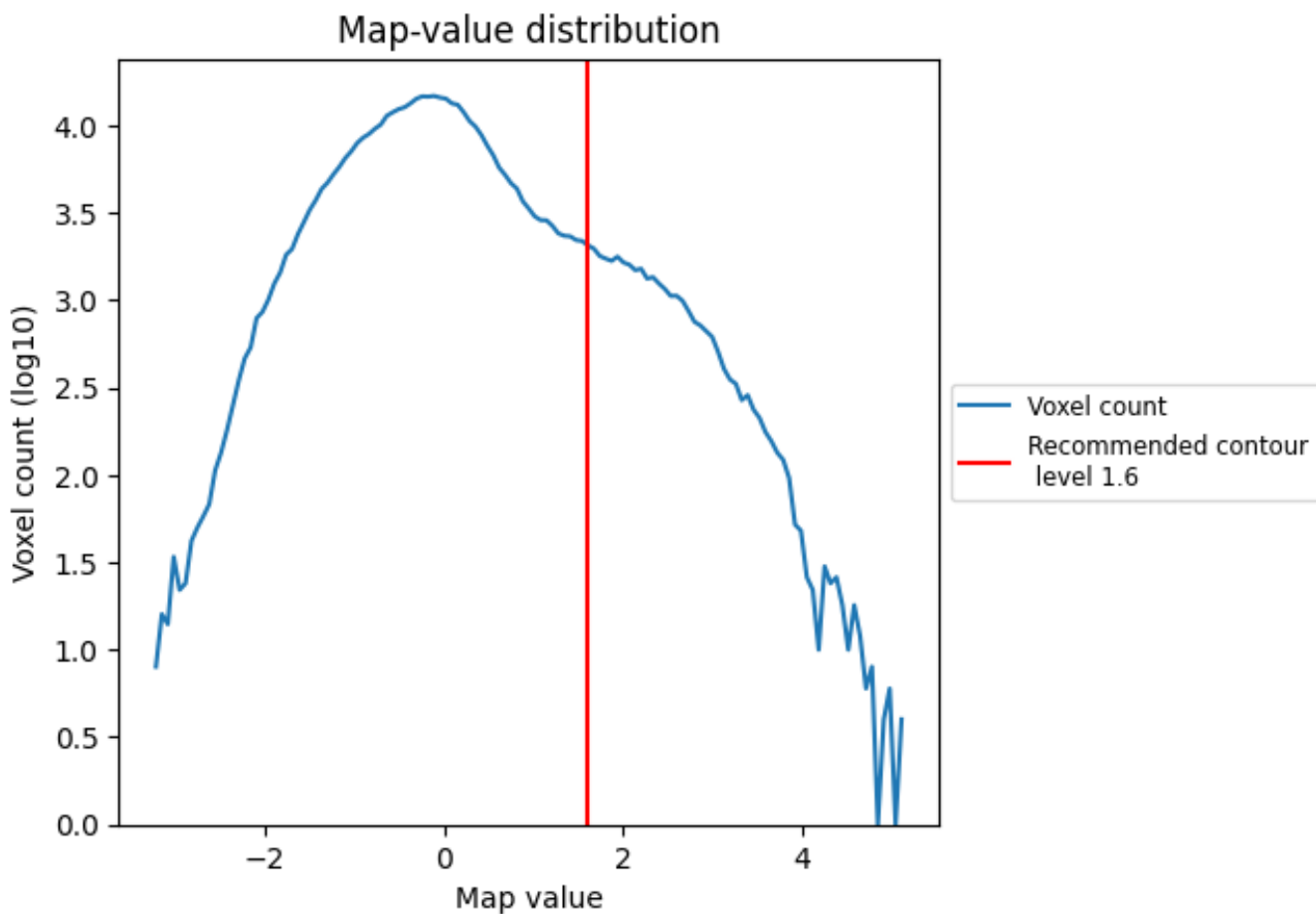
5.6   Mask visualisation ⓘ

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

6   Map analysis ⓘ

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

6.1   Map-value distribution ⓘ

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 ⓘ
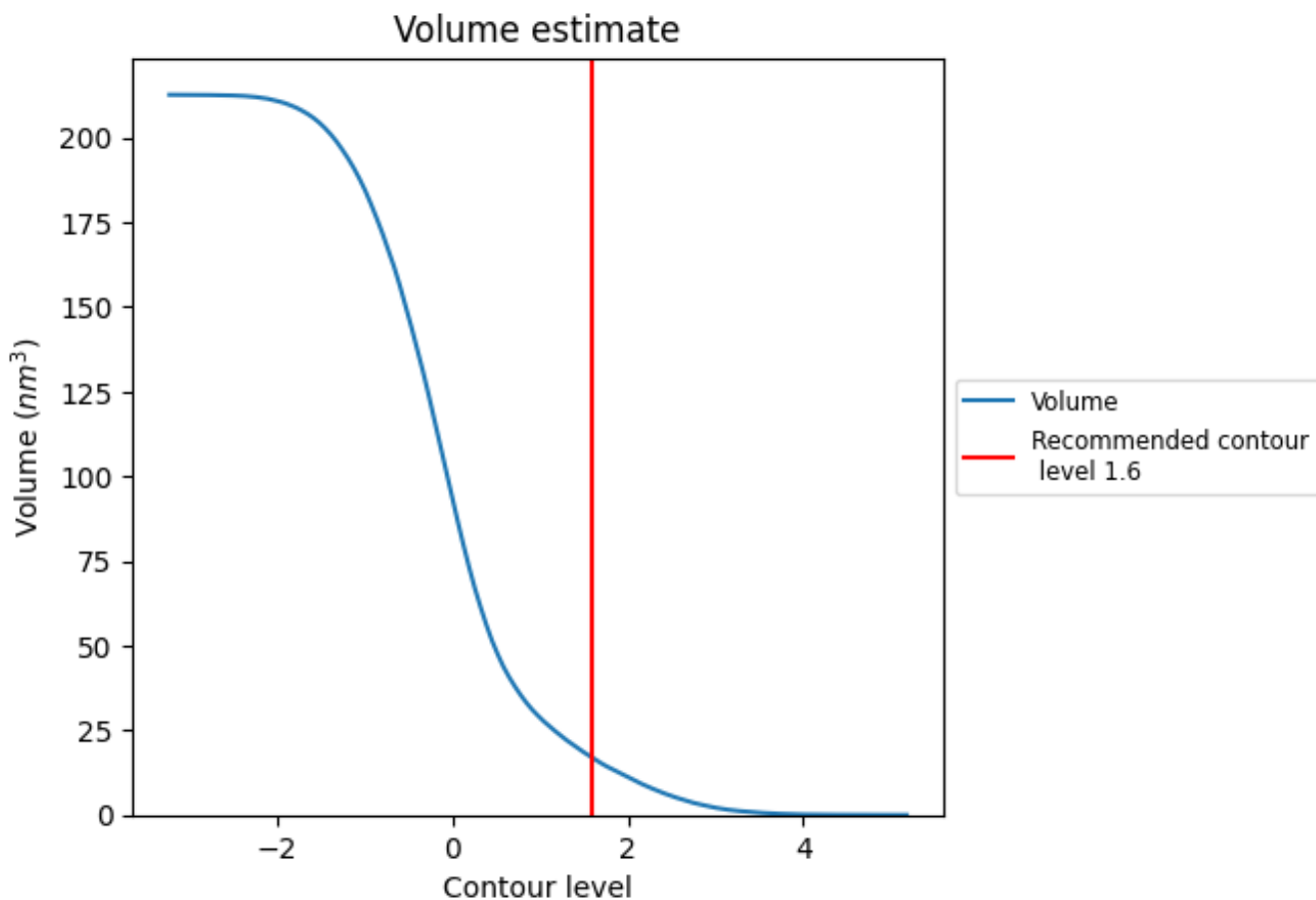
The volume at the recommended contour level is 17 nm³; this corresponds to an approximate mass of 15 kDa.

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 ⓘ

This section was not generated. The rotationally averaged power spectrum is only generated for cubic maps.

7 Fourier-Shell correlation ⓘ

This section was not generated. No FSC curve or half-maps provided.

8 Map-model fit ⓘ

This section contains information regarding the fit between EMDB map EMD-6342 and PDB model 5A3E. Per-residue inclusion information can be found in section **??** on page **??**.

8.1 Map-model overlay ⓘ

| X | Y | Z |
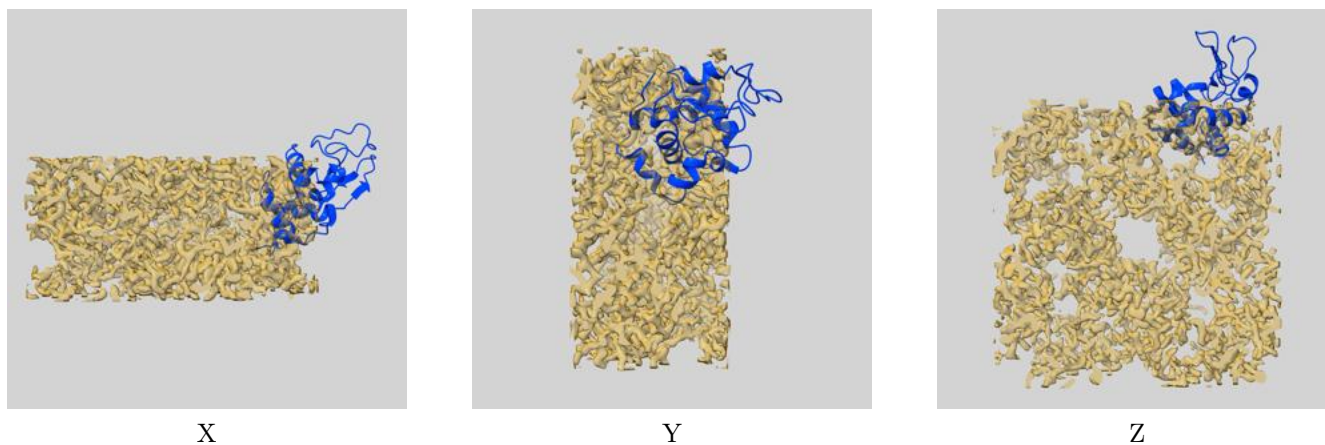
The images above show the 3D surface view of the map at the recommended contour level 1.6 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

8.2   Q-score mapped to coordinate model ⓘ

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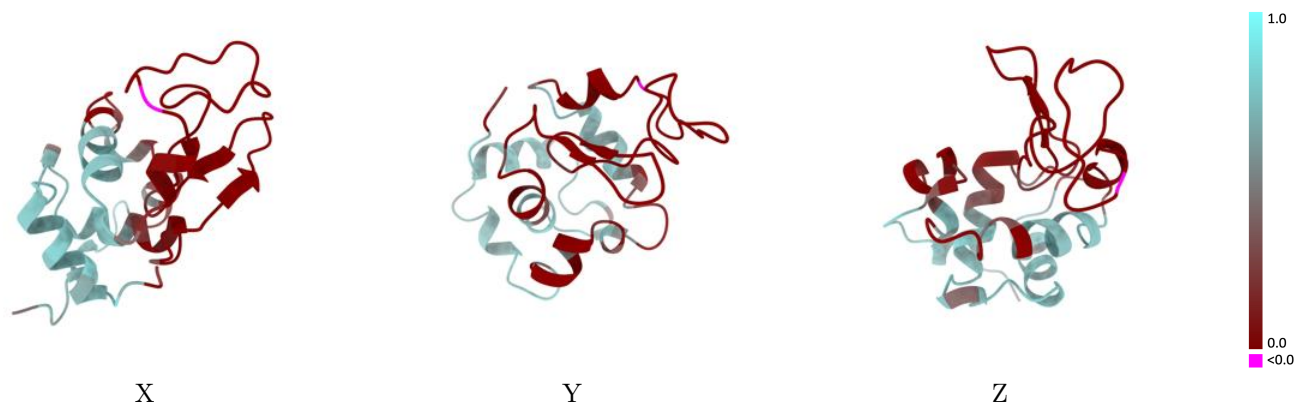
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

X   Y   Z
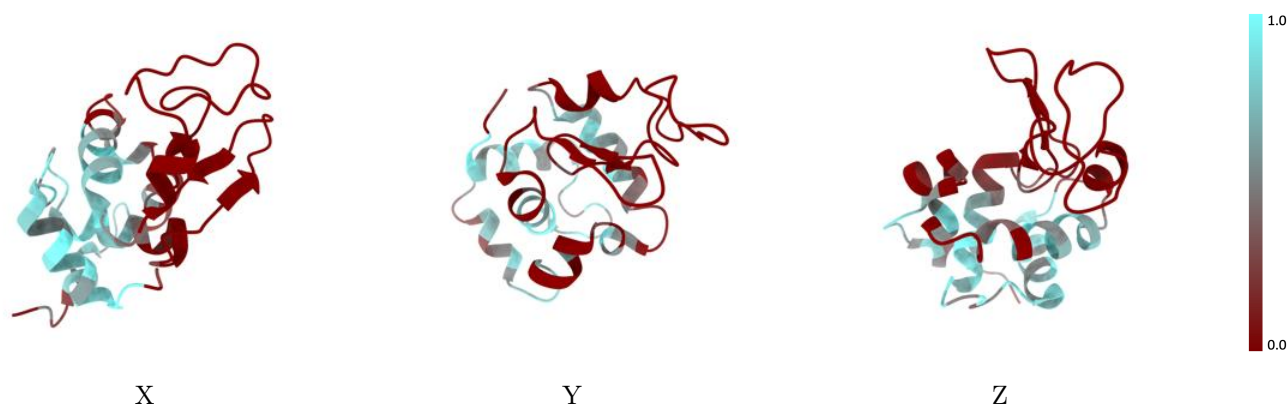
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (1.6).

8.4   Atom inclusion ⓘ
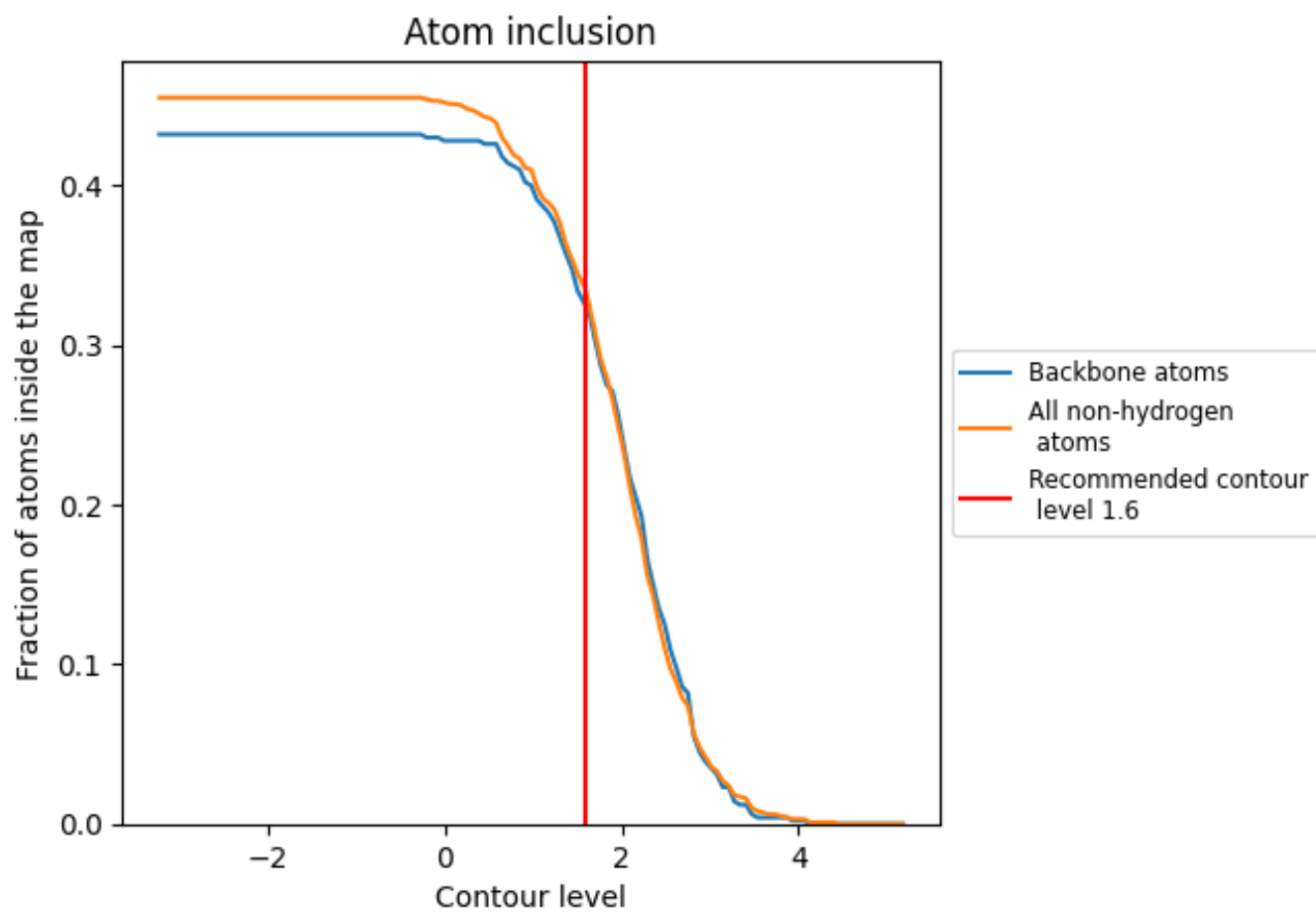
Atom inclusion

At the recommended contour level, 32% of all backbone atoms, 33% 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 (1.6) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.3340	0.3090
A	0.3340	0.3090