WORLDWIDE wwPDB
PROTEIN DATA BANK

wwPDB EM Validation Summary Report ⓘ

Nov 13, 2022 – 06:12 PM EST

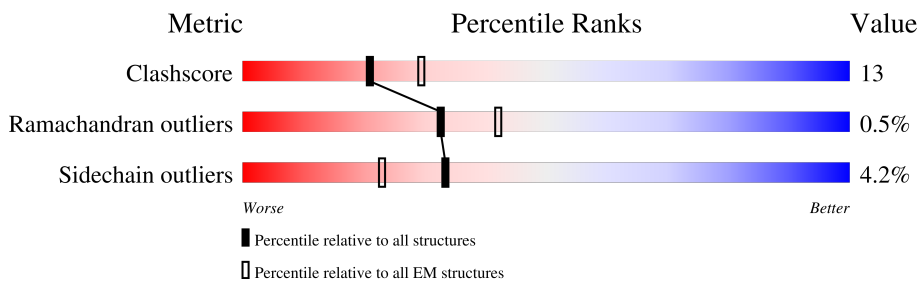|		
PDB ID	:	7JYI
EMDB ID	:	EMD-22526
Title	:	Subparticle Map of ZIKV MR-766
Authors	:	Jose, J.; Hafenstein, S.
Deposited on	:	2020-08-30
Resolution	:	3.40 Å(reported)

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 3.40 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		13
Ramachandran outliers		0.5%
Sidechain outliers		4.2%

Worse   *Better*

▮ Percentile relative to all structures
▯ Percentile relative to all EM structures

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 <=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	C	501	6% / 69% / 29% / •
1	E	501	5% / 70% / 28% / •
2	D	75	80% / 19% / •
2	F	75	83% / 17%

2 Entry composition ⓘ

There are 2 unique types of molecules in this entry. The entry contains 8807 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 E Glycoprotein.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	C	501	Total 3799	C 2397	N 653	O 719	S 30	0	0
1	E	501	Total 3799	C 2397	N 653	O 719	S 30	0	0

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	120	ALA	THR	conflict	UNP A0A140D2T1
C	317	ILE	VAL	conflict	UNP A0A140D2T1
E	120	ALA	THR	conflict	UNP A0A140D2T1
E	317	ILE	VAL	conflict	UNP A0A140D2T1

- Molecule 2 is a protein called M protein.

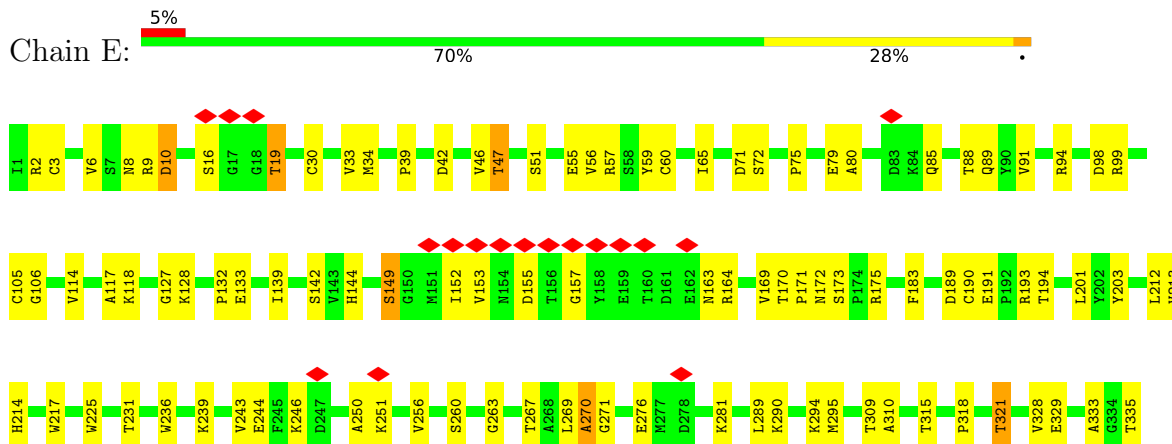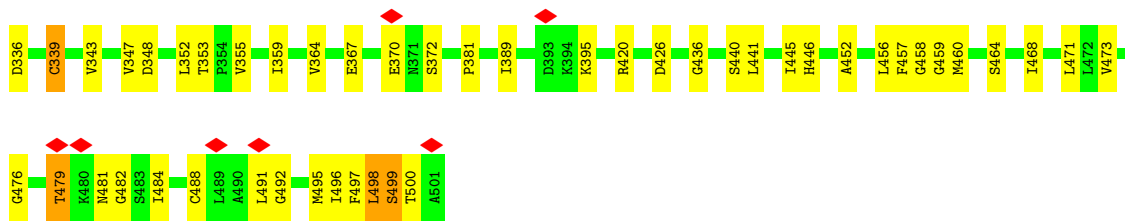| Mol	Chain	Residues	Atoms					AltConf	Trace
2	D	75	Total 604	C 396	N 103	O 104	S 1	0	0
2	F	75	Total 605	C 396	N 103	O 105	S 1	0	0

3 Residue-property plots ⓘ

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.
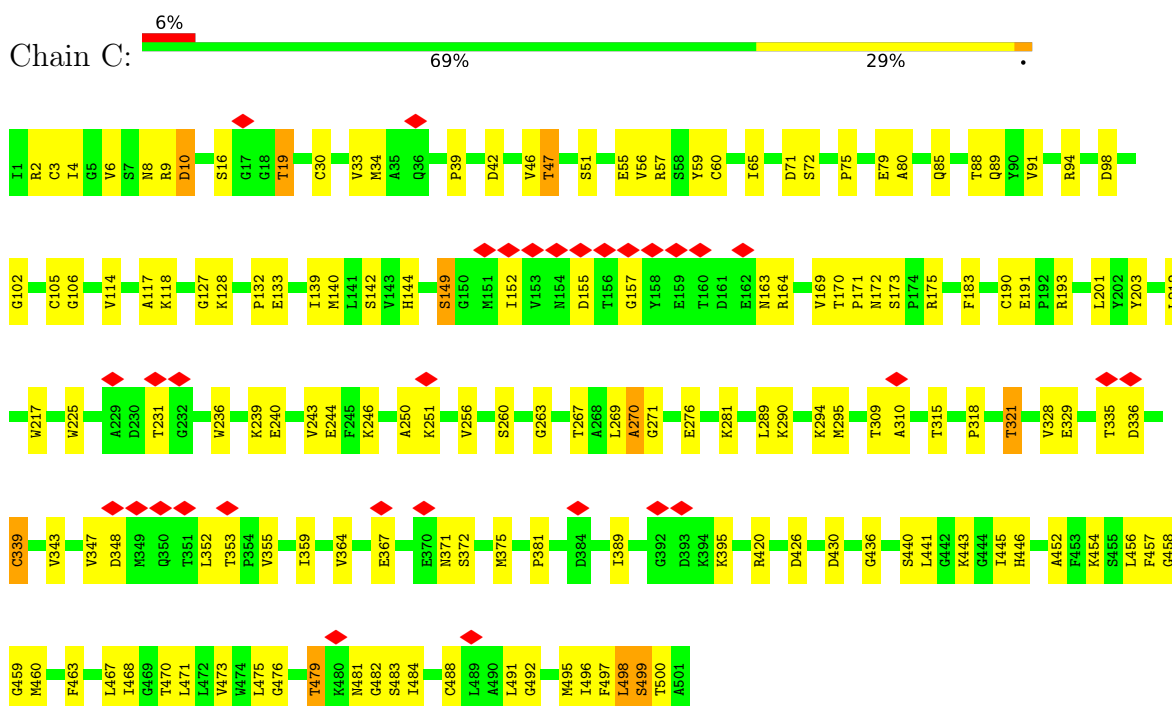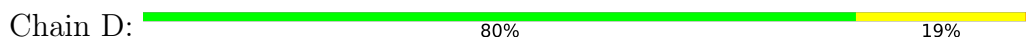
- Molecule 1: E Glycoprotein
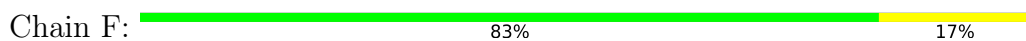

- Molecule 1: E Glycoprotein

D336 C339 V343 V347 D348 L352 T353 P354 V355 I359 V364 E367 E370 N371 S372 P381 I389 D393 K394 K395 R420 D426 G436 S440 L441 I445 H446 A452 L456 F457 G458 G459 M460 S464 I468 L471 L472 V473

G476 T479 K480 N481 G482 S483 I484 C488 L489 A490 L491 G492 M495 I496 F497 L498 S499 T500 A501

● Molecule 2: M protein

Chain D:

80%   19%   •

A1 P5 S6 H7 W19 N39 F42 T43 L44 V45 A46 V47 L53 S56 T57 S58 Q59 L69 Y74 S75

● Molecule 2: M protein

Chain F:

83%   17%

A1 P5 S6 H7 R10 W19 L20 R23 H28 R38 L52 Q59 A71 P72 S75

4   Experimental information ⓘ

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	9000	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 $(e^-/\text{Å}^2)$	41.7	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	FEI FALCON II (4k x 4k)	Depositor
Maximum map value	0.347	Depositor
Minimum map value	-0.191	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.012	Depositor
Recommended contour level	0.03	Depositor
Map size (Å)	330.0, 330.0, 330.0	wwPDB
Map dimensions	300, 300, 300	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.1, 1.1, 1.1	Depositor

5 Model quality ⓘ

5.1 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	C	0.42	0/3880	0.50	0/5253
1	E	0.42	0/3880	0.50	0/5253
2	D	0.39	0/619	0.47	0/844
2	F	0.39	0/620	0.48	0/844
All	All	0.41	0/8999	0.49	0/12194

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	C	0	1
1	E	0	1
All	All	0	2

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	C	498	LEU	Peptide
1	E	498	LEU	Peptide

5.2 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.

WORLDWIDE
wwPDB
PROTEIN DATA BANK

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	C	3799	0	3757	118	0
1	E	3799	0	3757	104	0
2	D	604	0	634	13	0
2	F	605	0	634	19	0
All	All	8807	0	8782	232	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 13.

The worst 5 of 232 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:C:488:CYS:O	1:C:491:LEU:HG	1.22	1.30
1:E:488:CYS:O	1:E:491:LEU:HG	1.22	1.25
1:C:191:GLU:OE1	1:C:290:LYS:HG2	1.54	1.06
1:E:488:CYS:HA	1:E:491:LEU:HD23	1.38	1.06
1:C:488:CYS:HA	1:C:491:LEU:HD23	1.38	1.00

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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	C	499/501 (100%)	443 (89%)	53 (11%)	3 (1%)	25	57
1	E	499/501 (100%)	443 (89%)	53 (11%)	3 (1%)	25	57
2	D	73/75 (97%)	67 (92%)	6 (8%)	0	100	100
2	F	73/75 (97%)	67 (92%)	6 (8%)	0	100	100
All	All	1144/1152 (99%)	1020 (89%)	118 (10%)	6 (0%)	32	61

5 of 6 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	458	GLY
1	E	458	GLY
1	C	499	SER
1	E	499	SER
1	C	270	ALA

5.3.2   Protein sidechains ⓘ

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	C	410/410 (100%)	391 (95%)	19 (5%)	27	57
1	E	410/410 (100%)	390 (95%)	20 (5%)	25	55
2	D	67/67 (100%)	66 (98%)	1 (2%)	65	82
2	F	67/67 (100%)	67 (100%)	0	100	100
All	All	954/954 (100%)	914 (96%)	40 (4%)	33	59

5 of 40 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	E	231	THR
1	E	364	VAL
1	E	256	VAL
1	E	335	THR
1	E	445	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 11 such sidechains are listed below:

Mol	Chain	Res	Type
1	E	208	ASN
1	E	249	HIS
2	F	7	HIS
1	E	371	ASN
2	D	39	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no monosaccharides in this entry.

5.6 Ligand geometry ⓘ

There are no ligands in this entry.

5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

6   Map visualisation (i)

This section contains visualisations of the EMDB entry EMD-22526. 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.

6.1   Orthogonal projections (i)

6.1.1   Primary map

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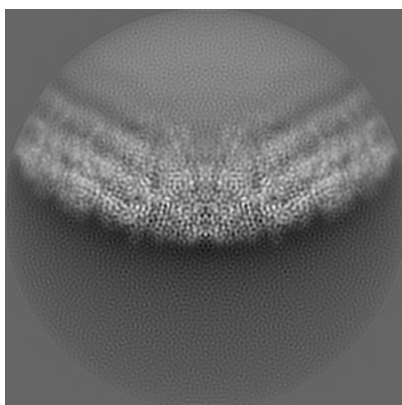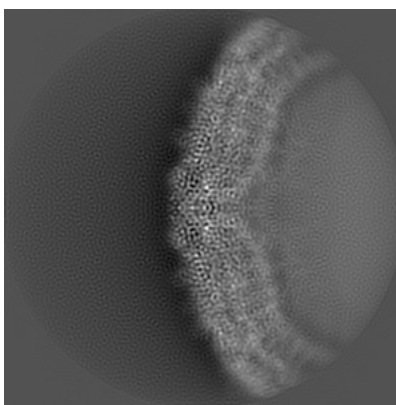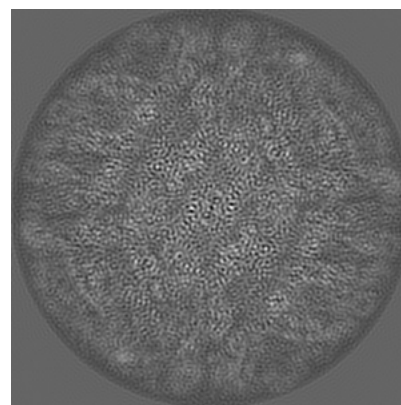
The images above show the map projected in three orthogonal directions.

6.2   Central slices (i)

6.2.1   Primary map
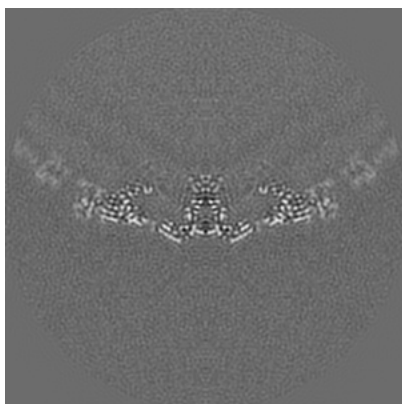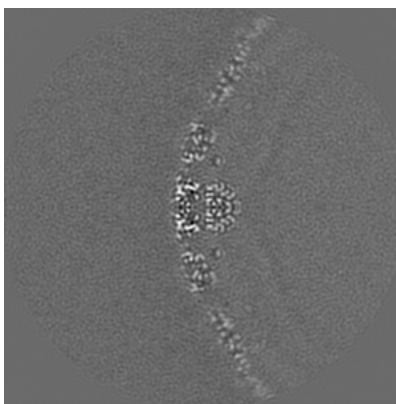
| X Index: 150 | Y Index: 150 | Z Index: 150 |
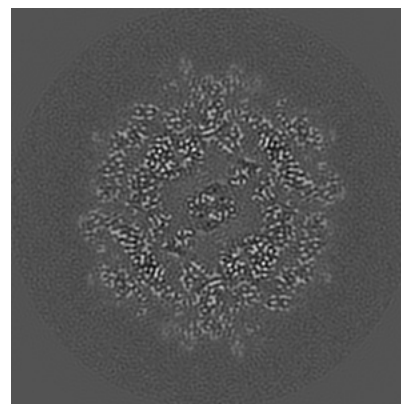
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices ⓘ
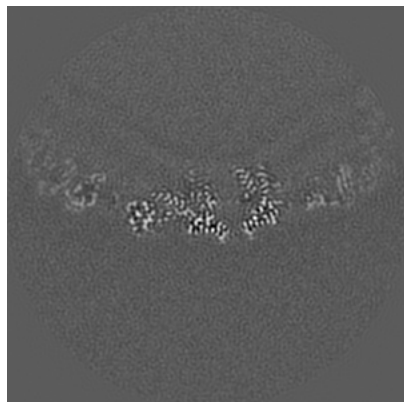
6.3.1 Primary map
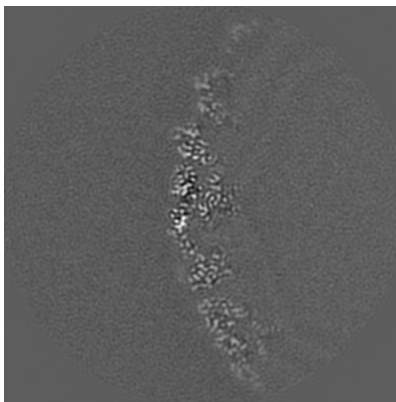
| X Index: 135 | Y Index: 158 | Z Index: 151 |
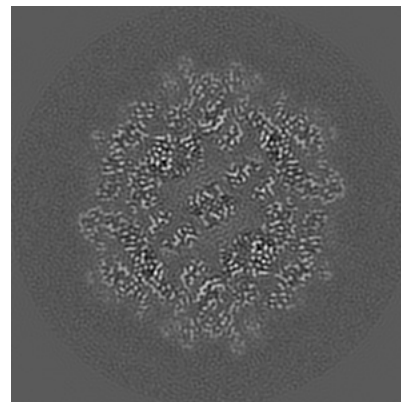
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal surface views ⓘ

6.4.1 Primary map

| X | Y | Z |
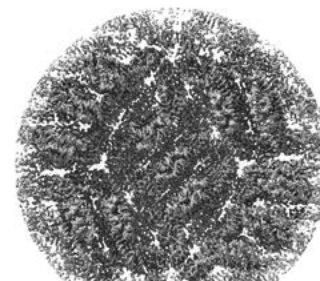
The images above show the 3D surface view of the map at the recommended contour level 0.03. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5   Mask visualisation ⓘ

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

7 Map analysis ⓘ

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

7.1 Map-value distribution ⓘ
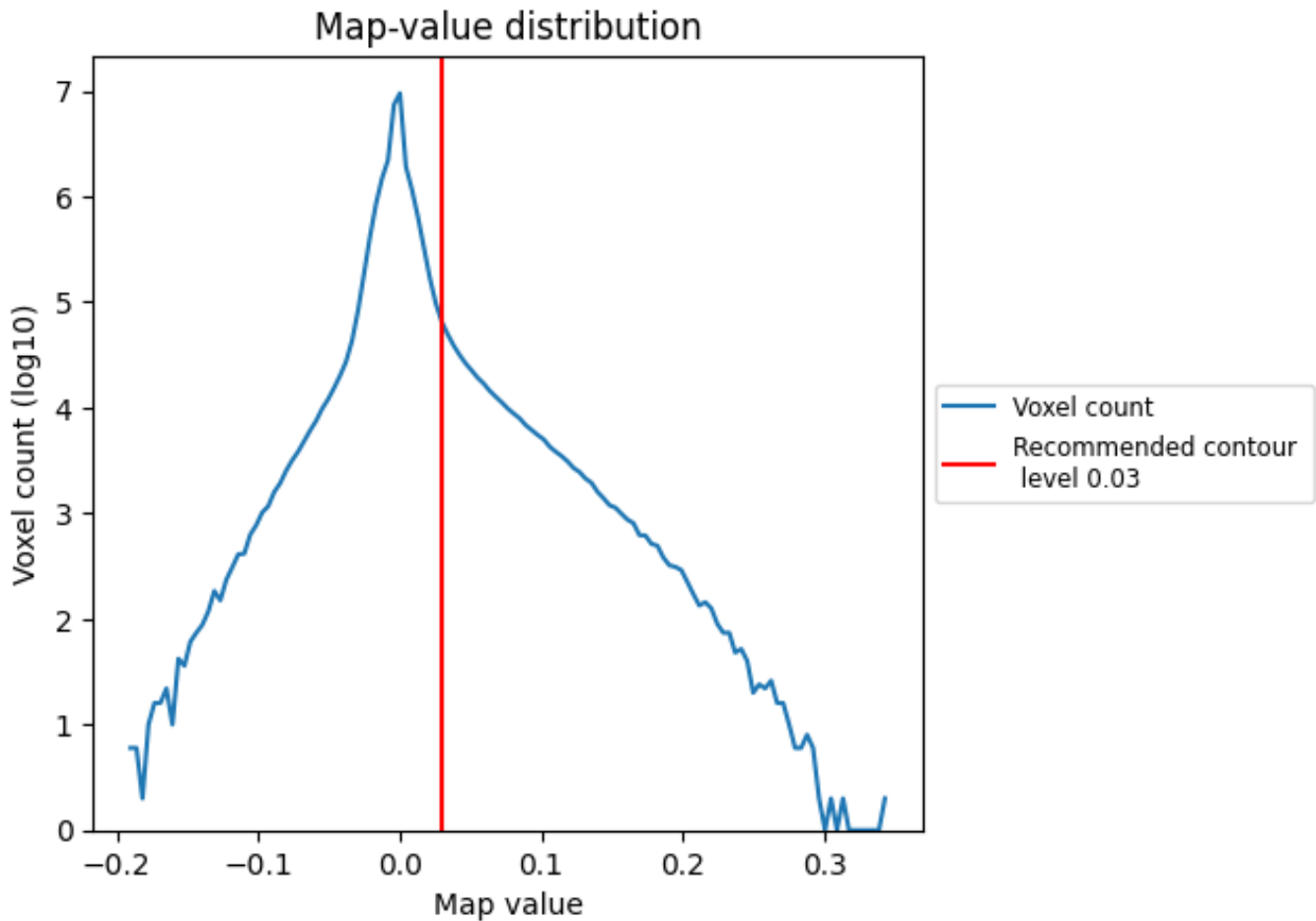
The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

7.2   Volume estimate ⓘ
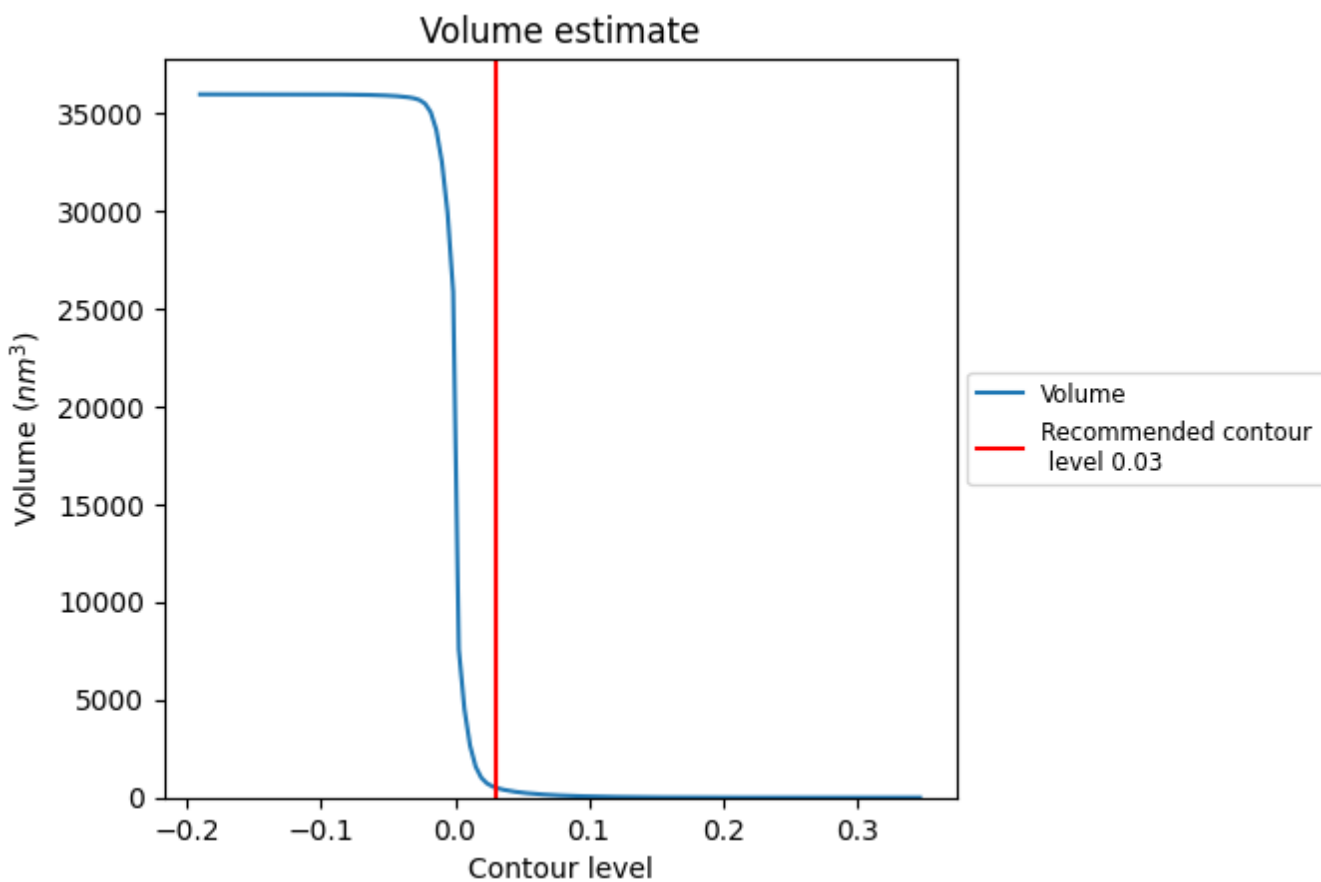
The volume at the recommended contour level is 523 nm^3; this corresponds to an approximate mass of 472 kDa.

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)
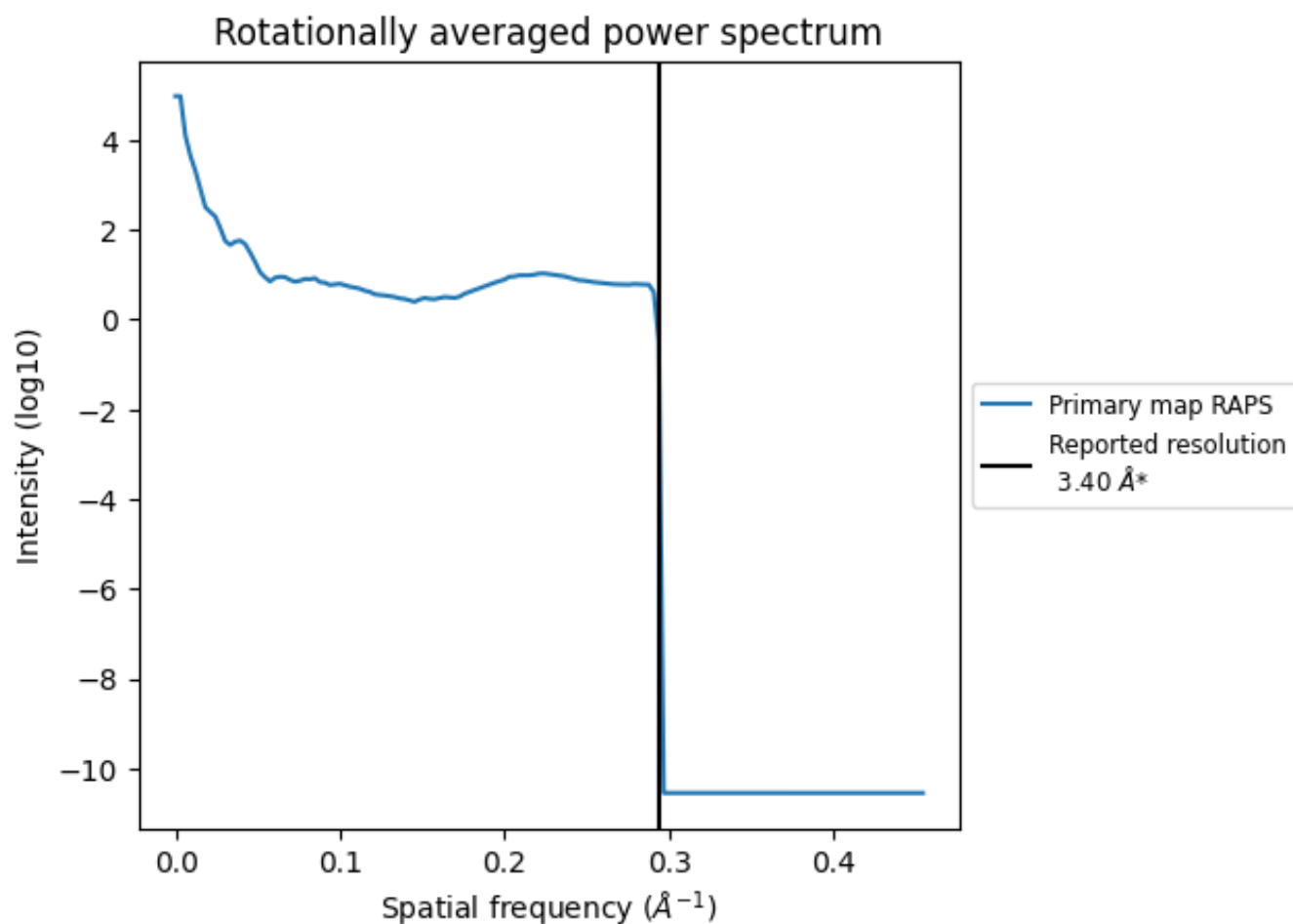
*Reported resolution corresponds to spatial frequency of 0.294 Å^{-1}

8 Fourier-Shell correlation (i)

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

9 Map-model fit ⓘ

This section contains information regarding the fit between EMDB map EMD-22526 and PDB model 7JYI. Per-residue inclusion information can be found in section 3 on page 4.

9.1 Map-model overlay ⓘ

| X | Y | Z |
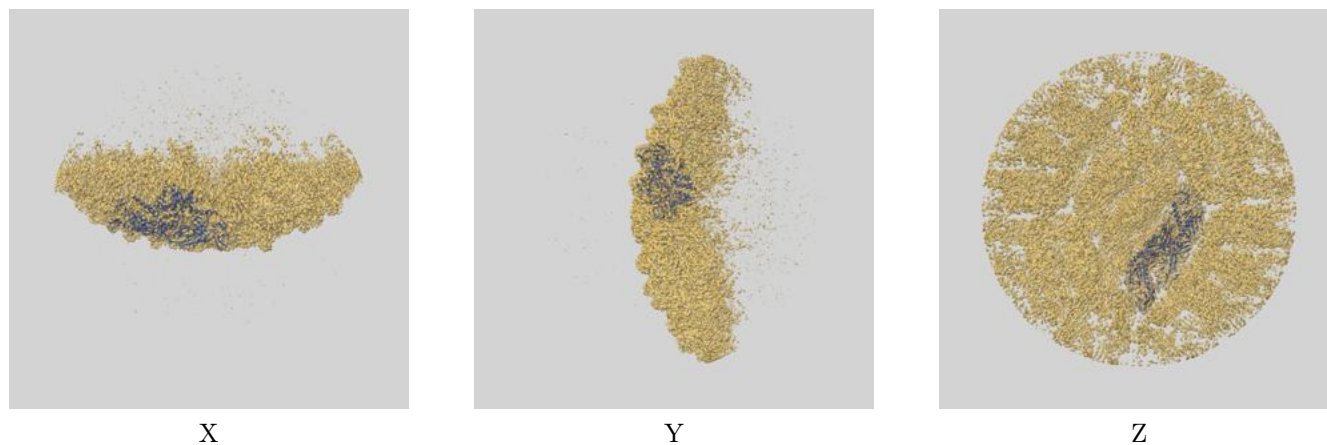
The images above show the 3D surface view of the map at the recommended contour level 0.03 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2   Q-score mapped to coordinate model ⓘ

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.

9.3   Atom inclusion mapped to coordinate model ⓘ

X   Y   Z
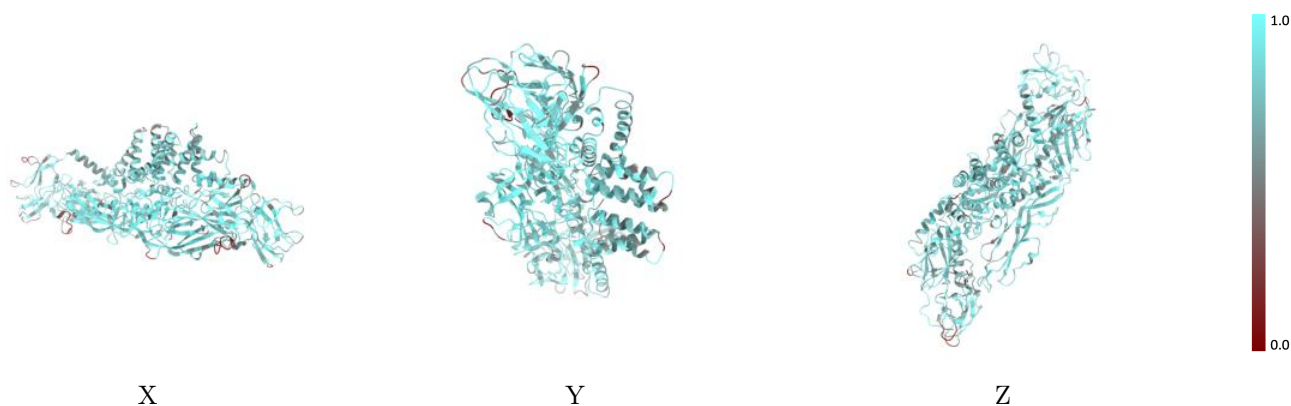
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.03).

9.4   Atom inclusion ⓘ
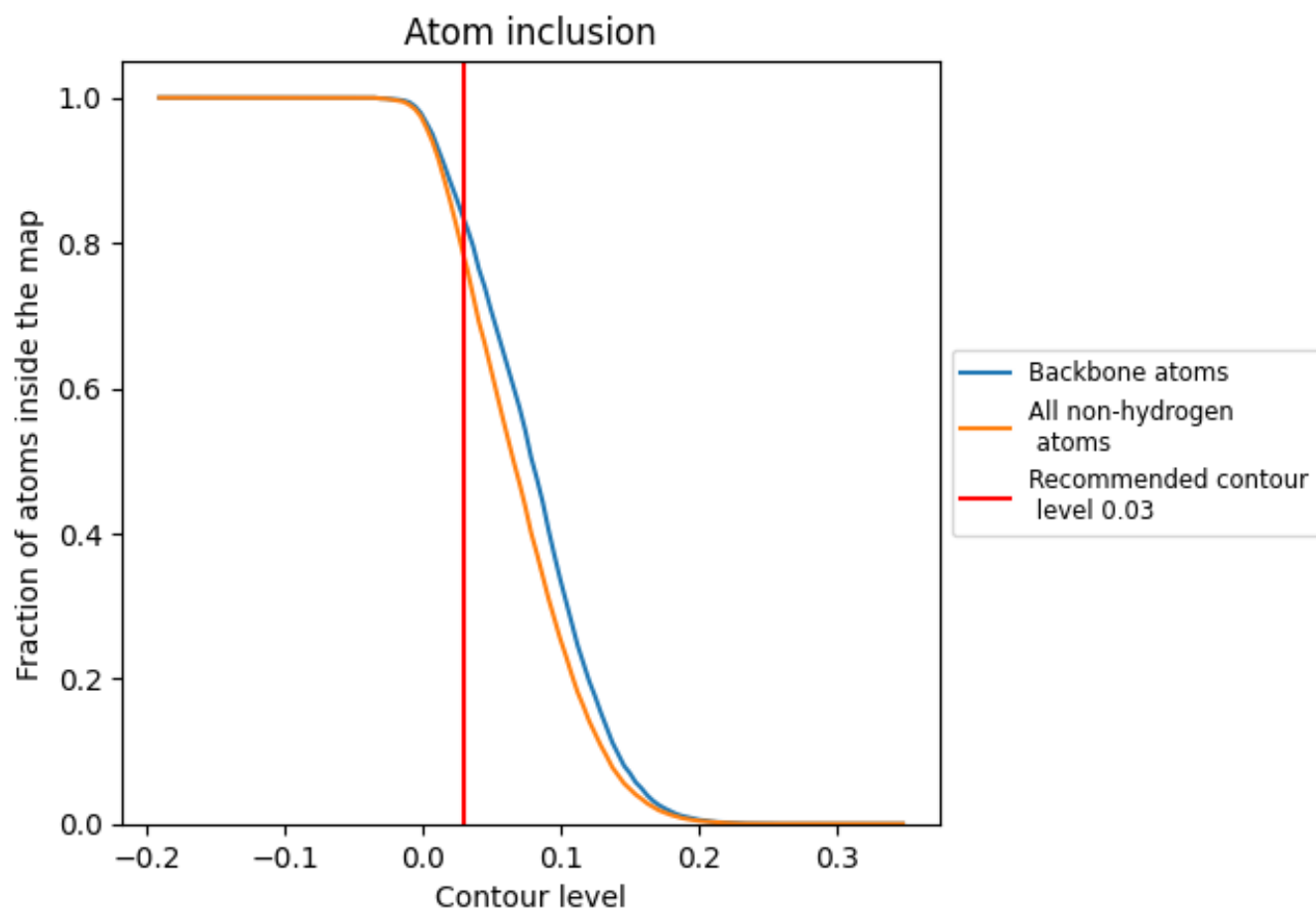
At the recommended contour level, 83% of all backbone atoms, 78% of all non-hydrogen atoms, are inside the map.

9.5   Map-model fit summary ⓘ

The table lists the average atom inclusion at the recommended contour level (0.03) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7794	0.5160
C	0.7636	0.5030
D	0.8051	0.5520
E	0.7818	0.5160
F	0.8393	0.5540

1.0

0.0
<0.0