Full wwPDB EM Validation Report ⓘ

Aug 8, 2025 – 10:14 am BST

PDB ID	:	9SAQ / pdb_00009saq
EMDB ID	:	EMD-54694
Title	:	Cryo-EM structure of SARS CoV-2 RdRp S759A mutant in complex with 20-40mer RNA incorporating ATP
Deposited on	:	2025-08-07
Resolution	:	3.10 Å(reported)

This wwPDB validation report is for manuscript review

This is a Full wwPDB EM Validation Report.

This report is produced by the wwPDB biocuration pipeline after annotation of the structure.

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.dev126
MolProbity	:	4-5-2 with Phenix2.0rc1
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.45.1

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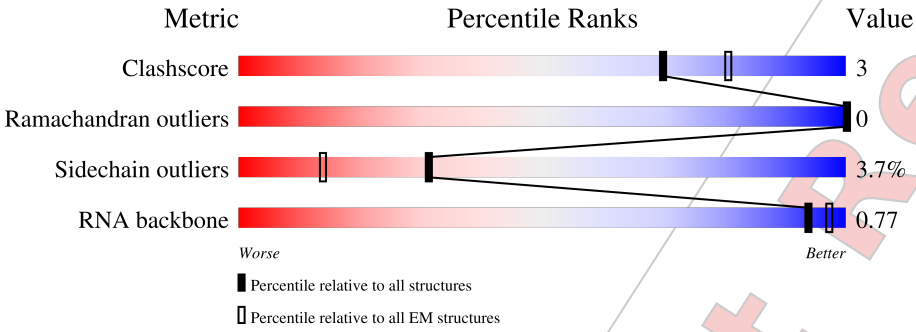
1 Overall quality at a glance (i)

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

The reported resolution of this entry is 3.10 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	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415
RNA backbone	6643	2191

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	P	27	44% 7% 48%
2	T	40	38% 5% 58%
3	A	928	86% 11%
4	B	198	49% 6% 42%
5	C	83	70% 5% 25%

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2 Entry composition (i)

There are 6 unique types of molecules in this entry. The entry contains 9305 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 RNA chain called RNA primer strand (27-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	P	14	300	135	56	95	14	0	0

- Molecule 2 is a RNA chain called RNA template strand (40-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
2	T	17	357	160	57	123	17	0	0

- Molecule 3 is a protein called RNA-directed RNA polymerase nsp12.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	A	905	7277	4657	1220	1350	50	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	759	ALA	SER	conflict	UNP P0DTD1

- Molecule 4 is a protein called Non-structural protein 8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	B	115	891	562	149	173	7	0	0

- Molecule 5 is a protein called Non-structural protein 7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	C	62	478	303	78	92	5	0	0

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- Molecule 6 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
			Total	Zn	
6	A	2	2	2	0

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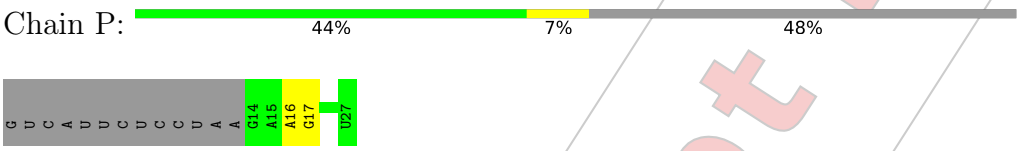
3 Residue-property plots (i)

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.

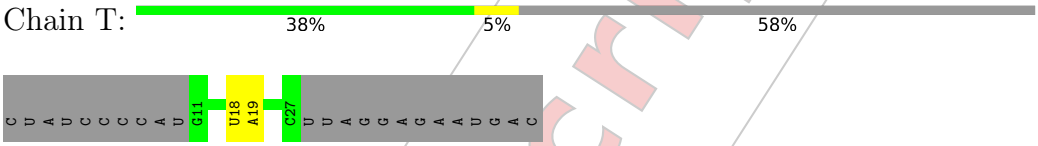
• Molecule 1: RNA primer strand (27-MER)

Chain P:



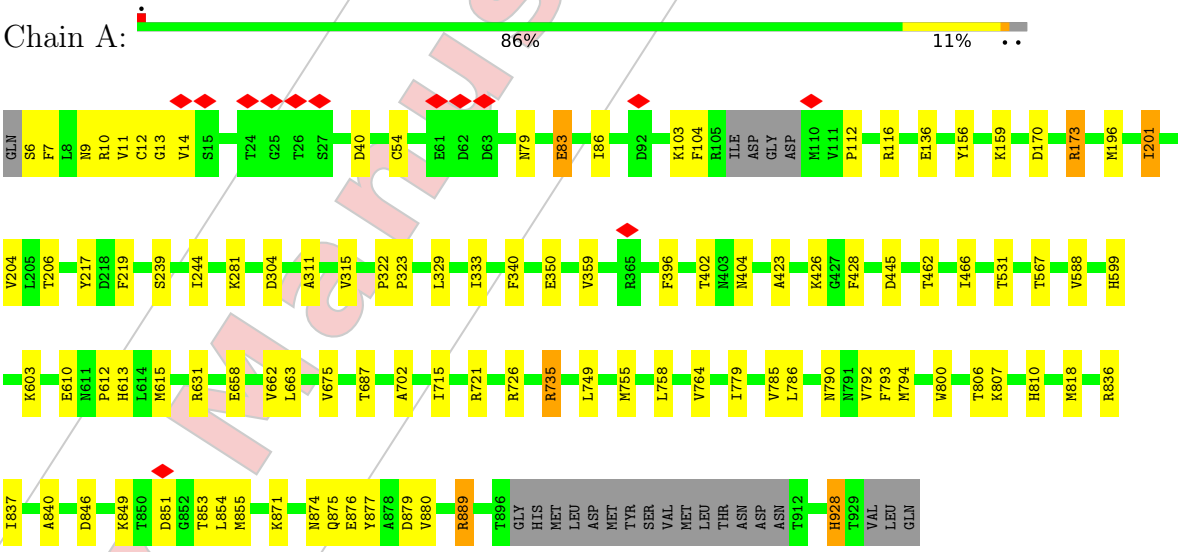
• Molecule 2: RNA template strand (40-MER)

Chain T:



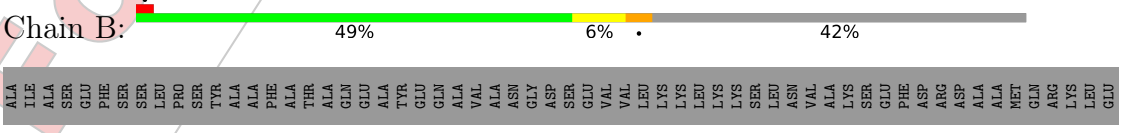
• Molecule 3: RNA-directed RNA polymerase nsp12

Chain A:



• Molecule 4: Non-structural protein 8

Chain B:



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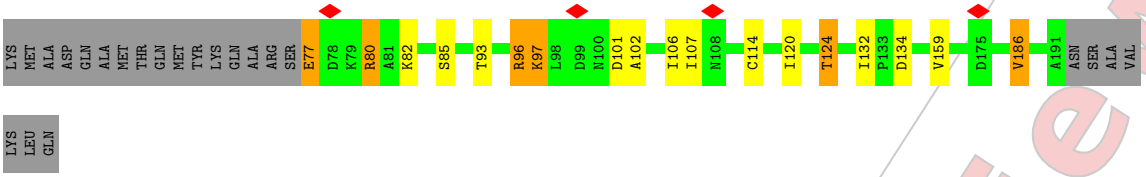
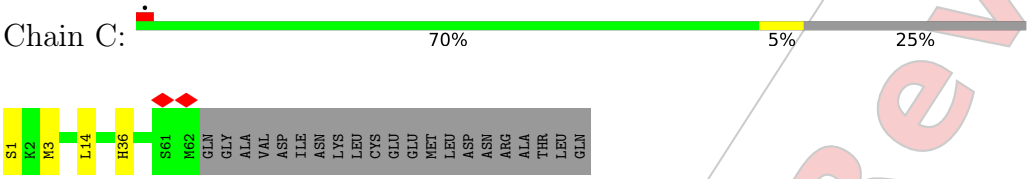


• Molecule 5: Non-structural protein 7



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4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	93716	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	TFS GLACIOS	Depositor
Voltage (kV)	200	Depositor
Electron dose ($e^-/Å^2$)	40.0	Depositor
Minimum defocus (nm)	600	Depositor
Maximum defocus (nm)	1800	Depositor
Magnification	130000	Depositor
Image detector	FEI FALCON IV (4k x 4k)	Depositor
Maximum map value	0.085	Depositor
Minimum map value	-0.046	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.005	Depositor
Recommended contour level	0.0076	Depositor
Map size (Å)	144.0, 144.0, 144.0	wwPDB
Map dimensions	160, 160, 160	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.9, 0.9, 0.9	Depositor

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5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: 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	P	0.08	0/336	0.11	0/521
2	T	0.10	0/397	0.14	0/615
3	A	0.41	1/7462 (0.0%)	0.62	6/10128 (0.1%)
4	B	0.69	0/904	0.84	0/1233
5	C	0.22	0/481	0.33	0/648
All	All	0.43	1/9580 (0.0%)	0.61	6/13145 (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
3	A	0	2
4	B	0	2
All	All	0	4

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	874	ASN	C-O	5.47	1.30	1.24

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	A	612	PRO	N-CA-C	5.88	120.09	111.03
3	A	928	HIS	CB-CA-C	-5.52	102.30	111.41
3	A	613	HIS	N-CA-C	-5.51	100.92	109.24
3	A	877	TYR	N-CA-CB	-5.50	101.67	110.19
3	A	880	VAL	CA-C-N	-5.19	113.70	120.44

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	A	880	VAL	C-N-CA	-5.19	113.70	120.44

There are no chirality outliers.

All (4) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
3	A	173	ARG	Sidechain
3	A	735	ARG	Sidechain
4	B	80	ARG	Sidechain
4	B	96	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	P	300	0	151	1	0
2	T	357	0	180	1	0
3	A	7277	0	7014	48	0
4	B	891	0	906	7	0
5	C	478	0	512	3	0
6	A	2	0	0	0	0
All	All	9305	0	8763	59	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 3.

All (59) 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:A:755:MET:HG2	3:A:764:VAL:HG22	1.77	0.67
3:A:531:THR:HG21	3:A:567:THR:HG21	1.84	0.59
3:A:658:GLU:O	3:A:662:VAL:HG22	2.09	0.53
3:A:315:VAL:HG12	3:A:350:GLU:HG3	1.90	0.52
3:A:790:ASN:HB3	3:A:792:VAL:HG22	1.91	0.52
4:B:120:ILE:O	4:B:124:THR:HB	2.09	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:588:VAL:HG23	3:A:758:LEU:HD12	1.94	0.49
3:A:631:ARG:HG2	3:A:663:LEU:HD13	1.94	0.49
3:A:851:ASP:OD2	3:A:853:THR:OG1	2.29	0.49
3:A:786:LEU:HD22	3:A:794:MET:HE3	1.95	0.47
3:A:103:LYS:HB3	3:A:112:PRO:HA	1.96	0.47
3:A:333:ILE:O	3:A:340:PHE:N	2.47	0.46
4:B:77:GLU:HB2	4:B:80:ARG:HB3	1.96	0.46
3:A:116:ARG:HG2	3:A:217:TYR:HB2	1.98	0.46
4:B:102:ALA:O	4:B:106:ILE:HG23	2.15	0.46
3:A:79:ASN:O	3:A:83:GLU:HB2	2.16	0.46
3:A:818:MET:SD	3:A:871:LYS:HB2	2.55	0.46
3:A:426:LYS:HD3	3:A:426:LYS:HA	1.73	0.46
3:A:7:PHE:O	3:A:11:VAL:HG23	2.16	0.45
3:A:715:ILE:O	3:A:721:ARG:NH2	2.50	0.45
3:A:402:THR:OG1	3:A:404:ASN:O	2.34	0.45
3:A:170:ASP:OD2	3:A:173:ARG:NH2	2.49	0.45
3:A:889:ARG:HA	3:A:889:ARG:HD3	1.38	0.45
3:A:702:ALA:HA	3:A:785:VAL:HG21	1.98	0.45
3:A:40:ASP:OD1	3:A:40:ASP:N	2.44	0.45
4:B:159:VAL:HG22	4:B:186:VAL:HG13	1.99	0.45
3:A:9:ASN:HA	3:A:12:CYS:SG	2.57	0.44
5:C:14:LEU:HD22	5:C:36:HIS:CG	2.52	0.44
3:A:846:ASP:HB2	3:A:849:LYS:HD2	1.99	0.44
3:A:445:ASP:N	3:A:445:ASP:OD1	2.48	0.44
1:P:16:A:H2'	1:P:17:G:C8	2.52	0.44
3:A:396:PHE:HB3	3:A:675:VAL:HB	2.00	0.44
3:A:599:HIS:O	3:A:603:LYS:HG2	2.17	0.44
3:A:836:ARG:HH12	3:A:840:ALA:HB2	1.83	0.44
3:A:156:TYR:O	3:A:159:LYS:HG2	2.19	0.43
3:A:836:ARG:NH1	3:A:840:ALA:HB2	2.34	0.43
2:T:18:U:H2'	2:T:19:A:C8	2.54	0.43
3:A:281:LYS:HB3	3:A:281:LYS:HE2	1.74	0.43
4:B:97:LYS:HB2	4:B:97:LYS:HE2	1.57	0.43
3:A:13:GLY:O	3:A:14:VAL:C	2.61	0.42
3:A:615:MET:HG3	3:A:779:ILE:HD11	2.01	0.42
3:A:196:MET:HE3	3:A:201:ILE:HG22	2.02	0.42
5:C:1:SER:C	5:C:3:MET:H	2.27	0.42
3:A:311:ALA:O	3:A:315:VAL:HG13	2.19	0.42
4:B:93:THR:HG22	4:B:97:LYS:HD3	2.01	0.42
5:C:14:LEU:HD12	5:C:14:LEU:HA	1.89	0.42
3:A:304:ASP:OD1	3:A:304:ASP:N	2.53	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:322:PRO:HA	3:A:323:PRO:HD3	1.93	0.42
3:A:854:LEU:HD12	3:A:855:MET:HG2	2.02	0.42
3:A:423:ALA:O	3:A:428:PHE:HB2	2.20	0.42
3:A:837:ILE:HD13	3:A:837:ILE:HA	1.89	0.42
3:A:800:TRP:CD2	3:A:810:HIS:HB3	2.55	0.41
3:A:83:GLU:HG2	3:A:219:PHE:HB2	2.02	0.41
3:A:196:MET:HE2	3:A:196:MET:HB3	1.86	0.41
3:A:329:LEU:HB3	4:B:114:CYS:SG	2.61	0.41
3:A:86:ILE:HG21	3:A:219:PHE:HB3	2.03	0.40
3:A:136:GLU:HG2	3:A:793:PHE:CZ	2.56	0.40
3:A:603:LYS:HA	3:A:603:LYS:HD2	1.86	0.40
3:A:749:LEU:HD23	3:A:749:LEU:HA	1.92	0.40

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	
3	A	899/928 (97%)	873 (97%)	26 (3%)	0	100	100
4	B	113/198 (57%)	107 (95%)	6 (5%)	0	100	100
5	C	60/83 (72%)	57 (95%)	3 (5%)	0	100	100
All	All	1072/1209 (89%)	1037 (97%)	35 (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.

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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
3	A	793/820 (97%)	769 (97%)	24 (3%)	36 64
4	B	101/167 (60%)	90 (89%)	11 (11%)	5 21
5	C	59/77 (77%)	59 (100%)	0	100 100
All	All	953/1064 (90%)	918 (96%)	35 (4%)	31 59

All (35) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	A	6	SER
3	A	10	ARG
3	A	54	CYS
3	A	83	GLU
3	A	104	PHE
3	A	201	ILE
3	A	204	VAL
3	A	206	THR
3	A	239	SER
3	A	244	ILE
3	A	359	VAL
3	A	462	THR
3	A	466	ILE
3	A	610	GLU
3	A	687	THR
3	A	726	ARG
3	A	735	ARG
3	A	806	THR
3	A	807	LYS
3	A	875	GLN
3	A	876	GLU
3	A	879	ASP
3	A	889	ARG
3	A	928	HIS
4	B	77	GLU
4	B	82	LYS
4	B	85	SER
4	B	96	ARG
4	B	97	LYS
4	B	101	ASP
4	B	107	ILE

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Mol	Chain	Res	Type
4	B	124	THR
4	B	132	ILE
4	B	134	ASP
4	B	186	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (14) such sidechains are listed below:

Mol	Chain	Res	Type
3	A	82	HIS
3	A	381	HIS
3	A	414	ASN
3	A	459	ASN
3	A	468	GLN
3	A	492	GLN
3	A	613	HIS
3	A	705	ASN
4	B	88	GLN
4	B	100	ASN
4	B	104	ASN
4	B	109	ASN
5	C	34	GLN
5	C	36	HIS

5.3.3 RNA (i)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	P	13/27 (48%)	0	0
2	T	16/40 (40%)	0	0
All	All	29/67 (43%)	0	0

There are no RNA backbone outliers to report.

There are no RNA pucker outliers to report.

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

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

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5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 2 ligands modelled in this entry, 2 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.

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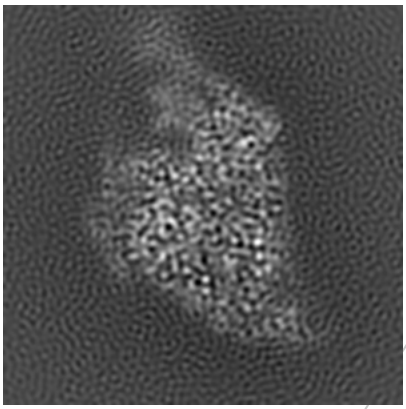
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-54694. These allow visual inspection of the internal detail of the map and identification of artifacts.

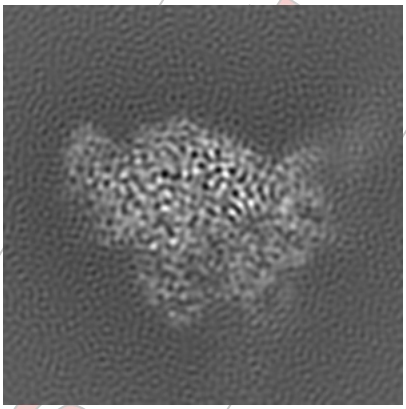
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

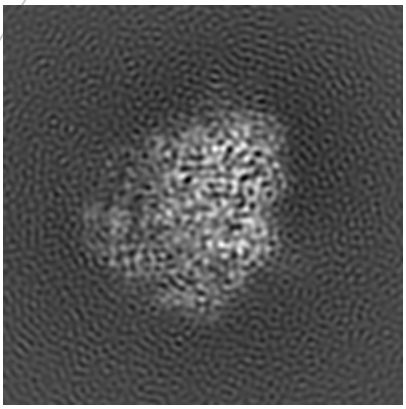
6.1.1 Primary map



X

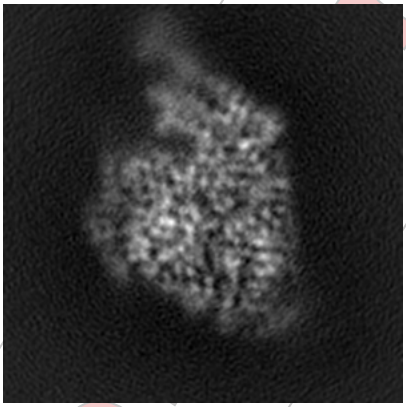


Y



Z

6.1.2 Raw map



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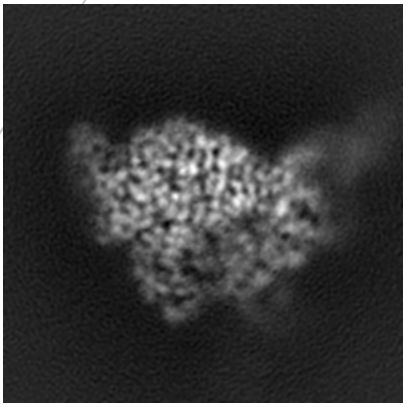
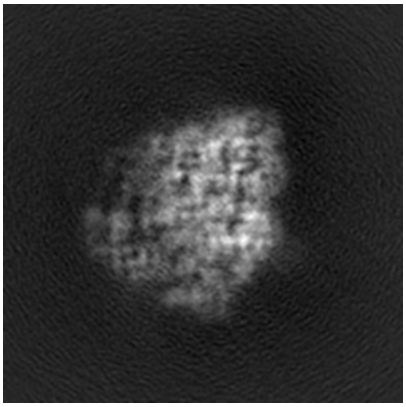


Y



Z

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

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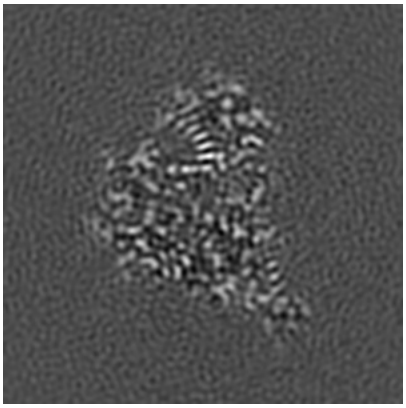
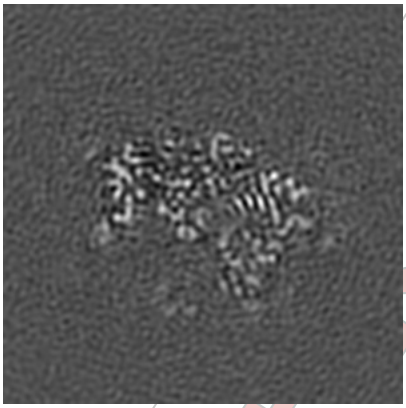
6.2 Central slices (i)

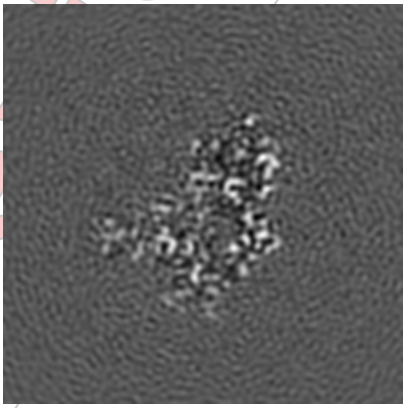
6.2.1 Primary map



X Index: 80

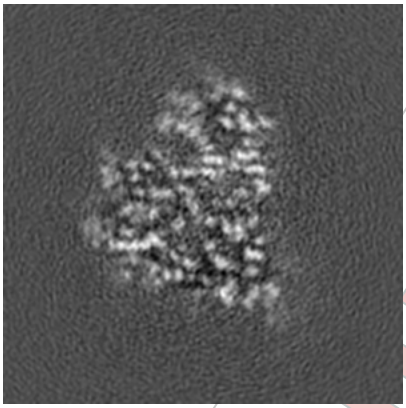


Y Index: 80

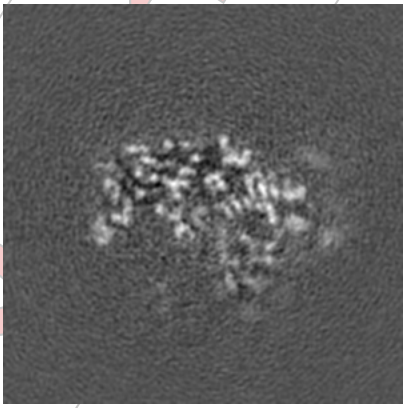


Z Index: 80

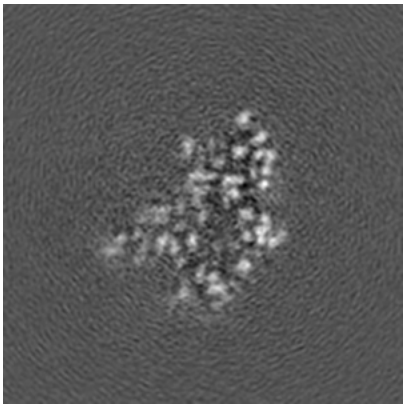
6.2.2 Raw map



X Index: 80



Y Index: 80



Z Index: 80

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

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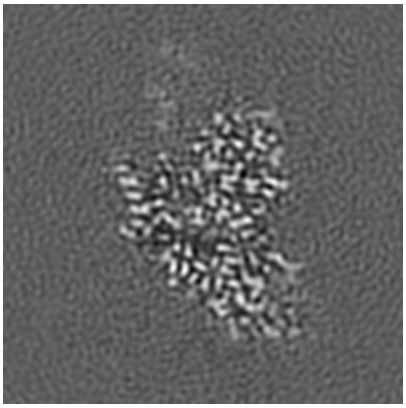
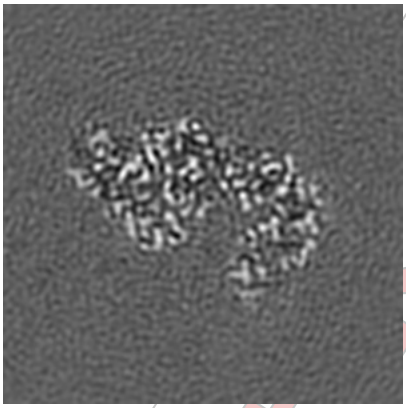
6.3 Largest variance slices (i)

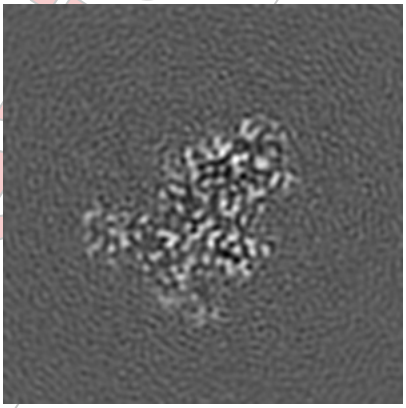
6.3.1 Primary map



X Index: 92

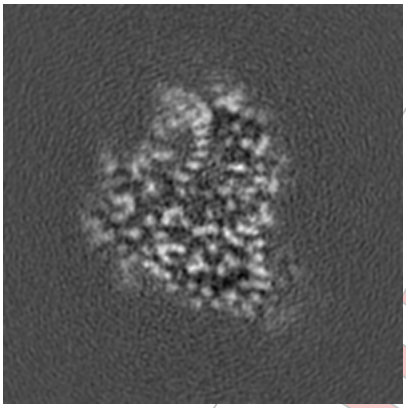


Y Index: 92

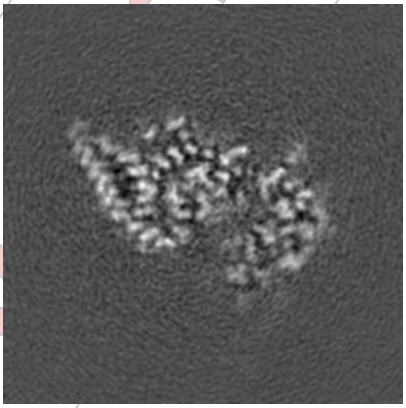


Z Index: 73

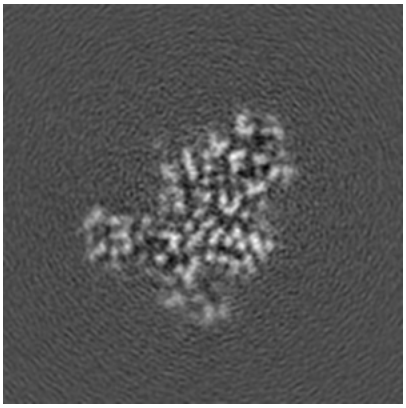
6.3.2 Raw map



X Index: 83



Y Index: 90



Z Index: 72

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

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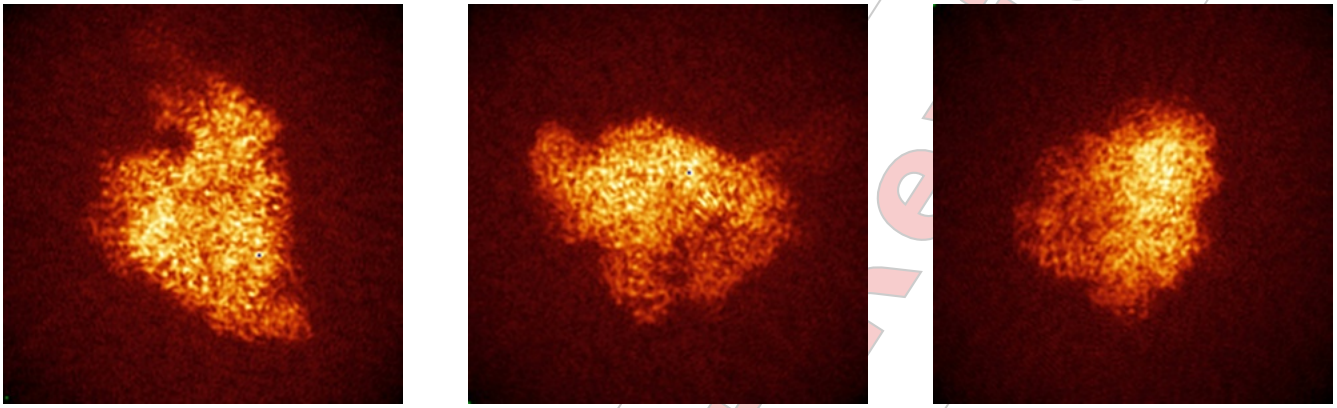
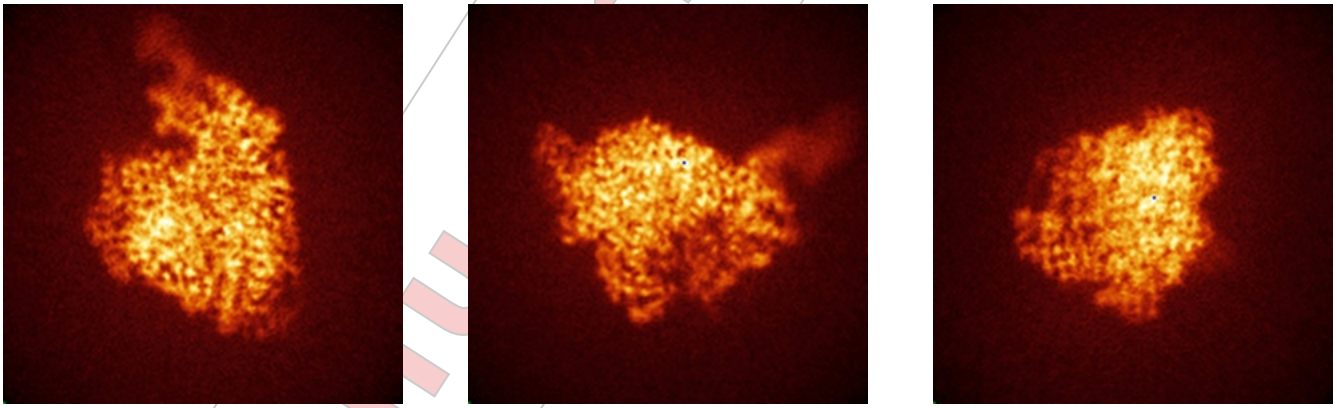
6.4 Orthogonal standard-deviation projections (False-color)

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.

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6.5 Orthogonal surface views (i)

6.5.1 Primary map

X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.0076. 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

X Y Z

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.

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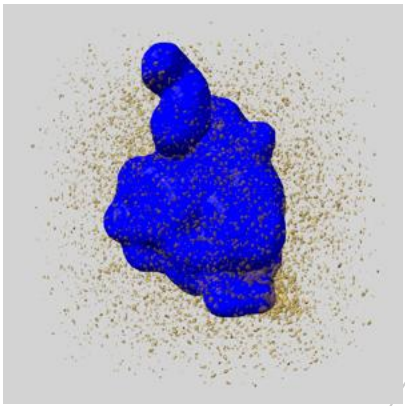
6.6 Mask visualisation

This section shows the 3D surface view of the primary map at 50% transparency overlaid with the specified mask at 0% transparency

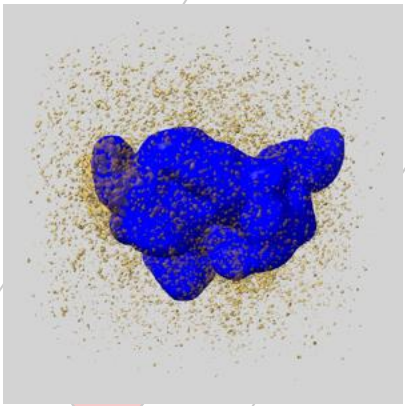
A mask typically either:

- Encompasses the whole structure
- Separates out a domain, a functional unit, a monomer or an area of interest from a larger structure

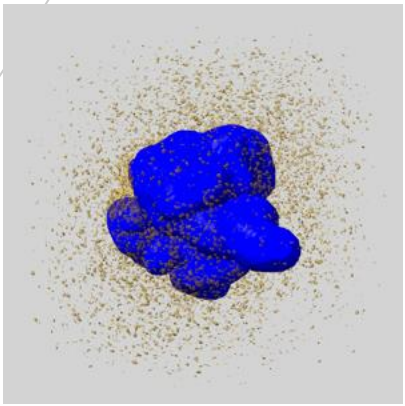
6.6.1 D_1292149405_em-mask-volume_P1.map.V2



X



Y



Z

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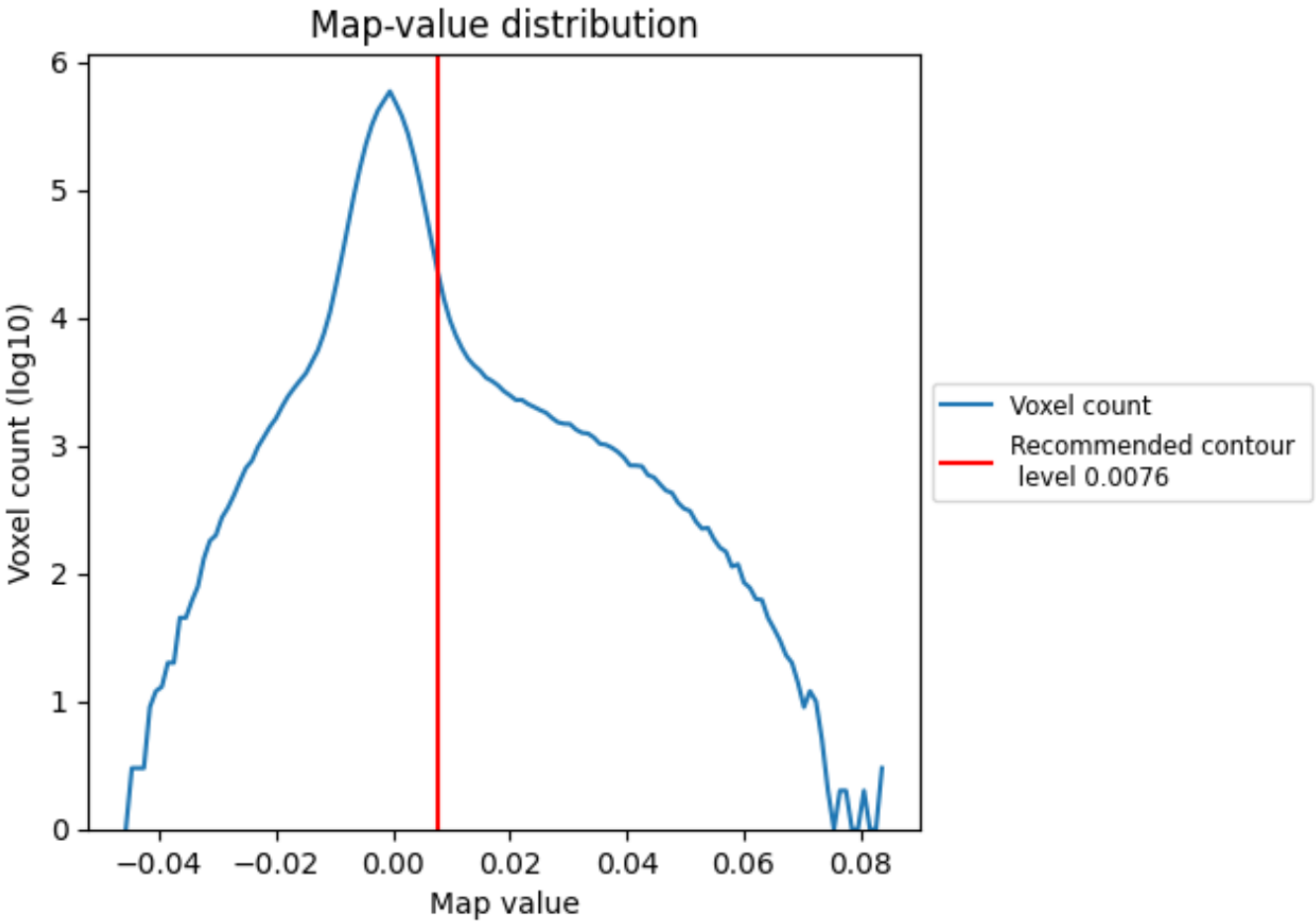
7 Map analysis

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.

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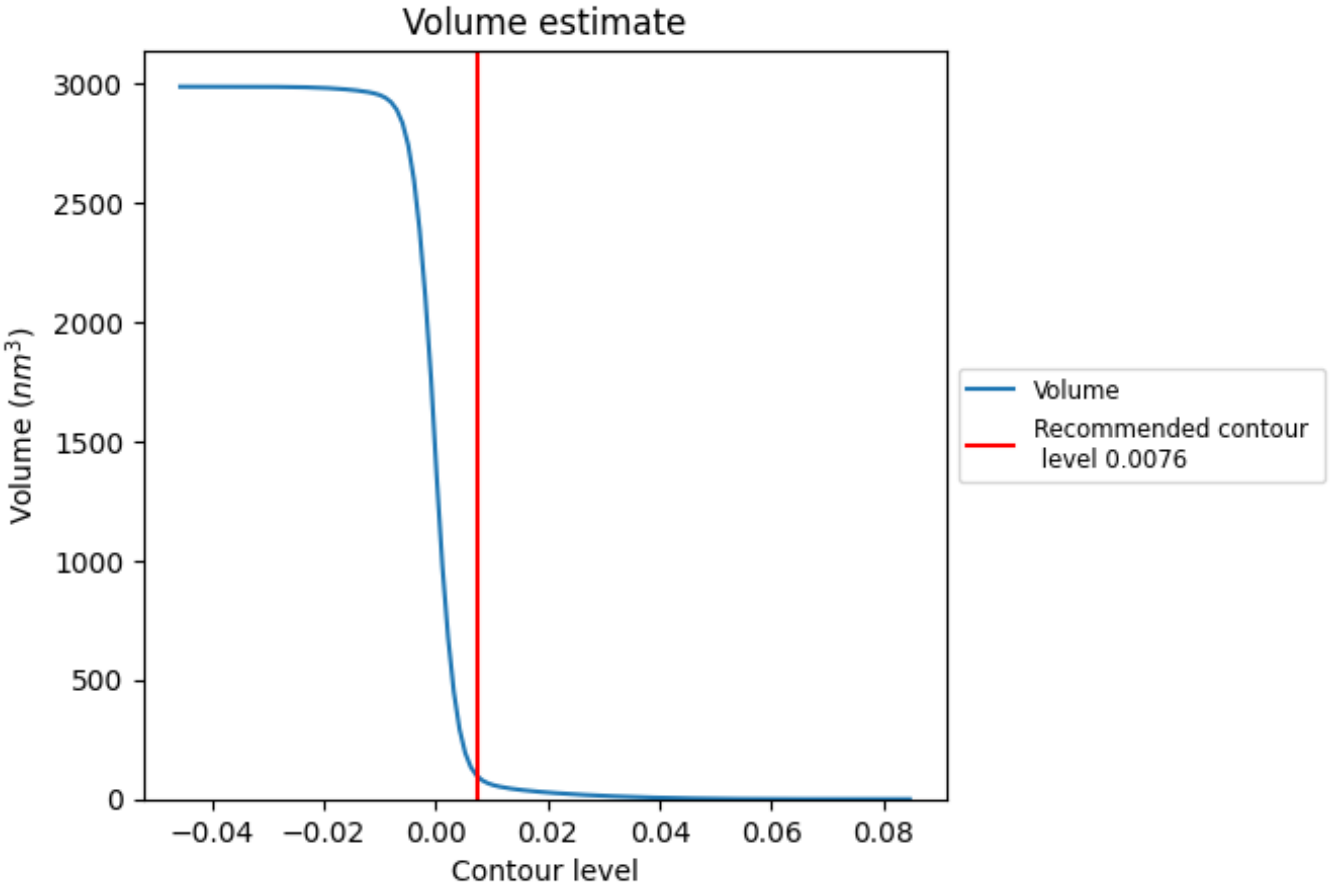
7.2 Volume estimate (i)

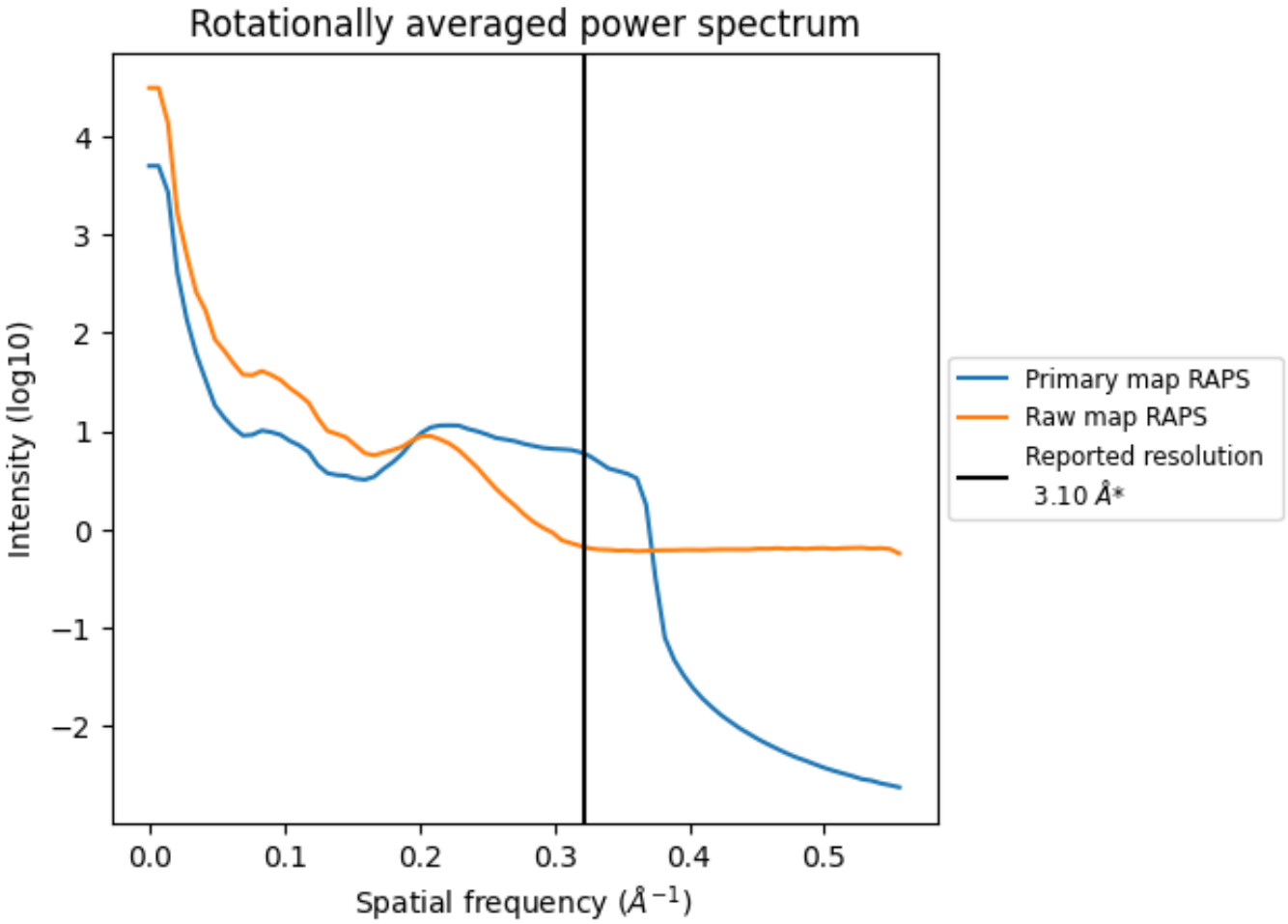


The volume at the recommended contour level is 93 nm^3; this corresponds to an approximate mass of 84 kDa.

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.

For Manus

7.3 Rotationally averaged power spectrum (i)



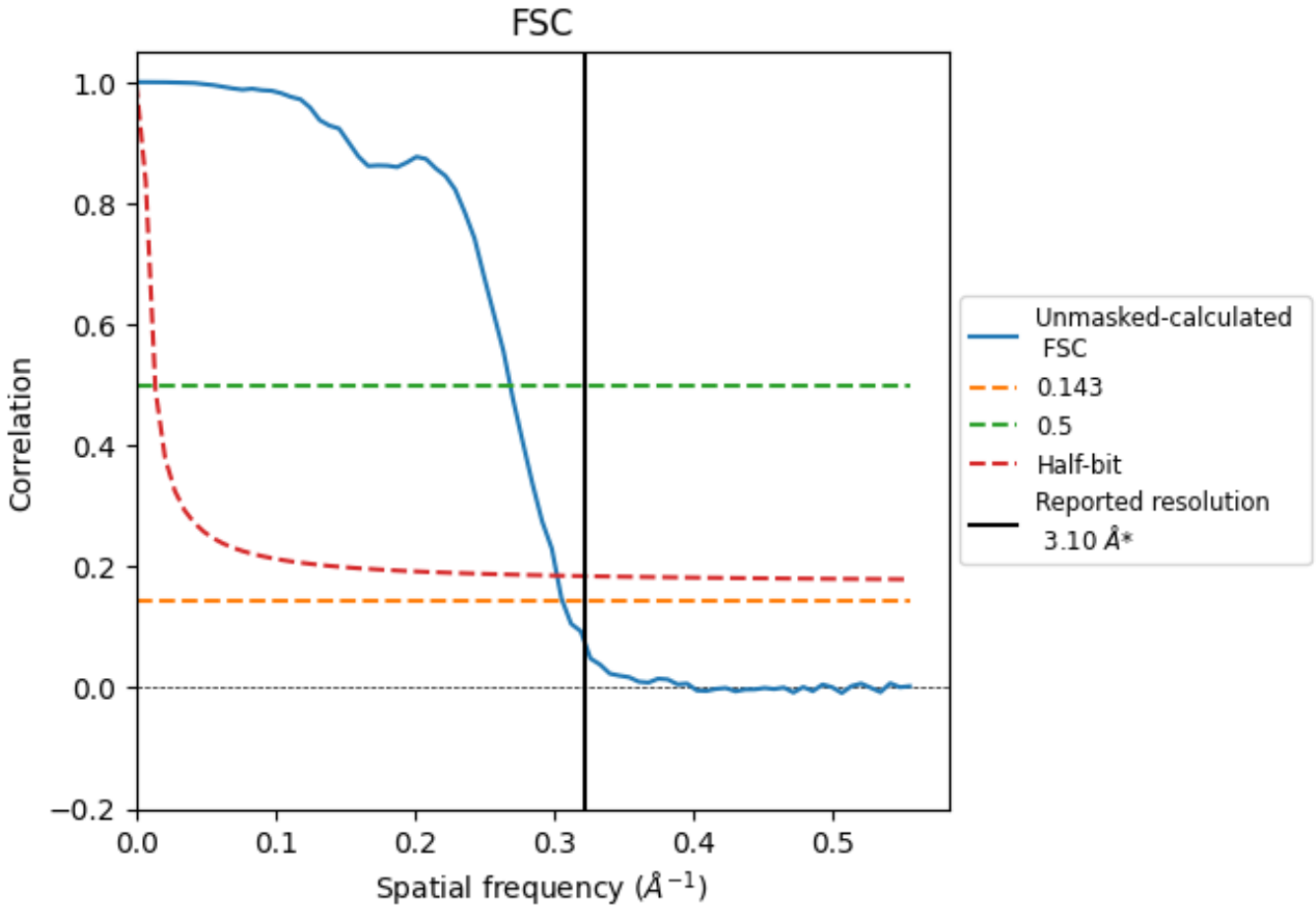
*Reported resolution corresponds to spatial frequency of 0.323 Å^{-1}

For Manu

8 Fourier-Shell correlation

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

8.1 FSC



*Reported resolution corresponds to spatial frequency of 0.323 Å^{-1}

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8.2 Resolution estimates (i)

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.10	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	3.27	3.72	3.31

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

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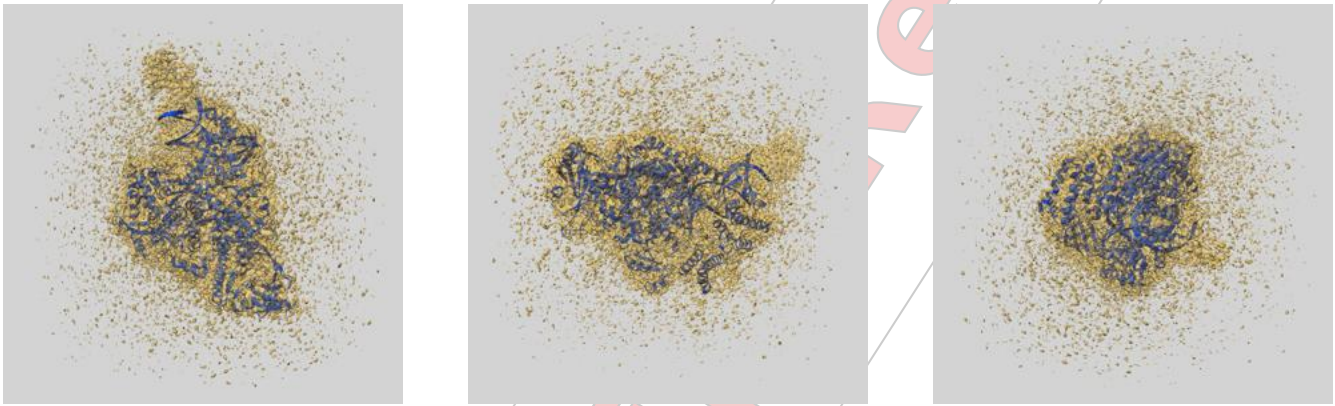
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-54694 and PDB model 9SAQ. Per-residue inclusion information can be found in section 3 on page 5.

9.1 Map-model overlay



X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.0076 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.

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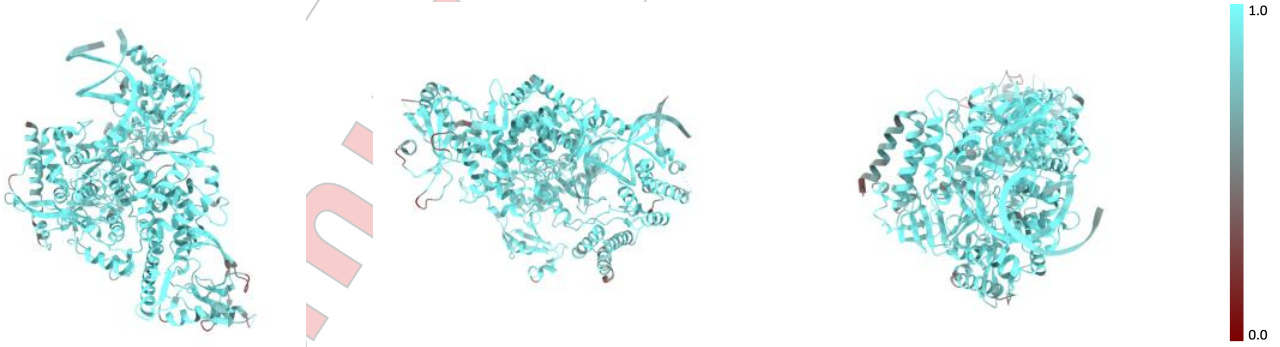
9.2 Q-score mapped to coordinate model

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 (0.0076).

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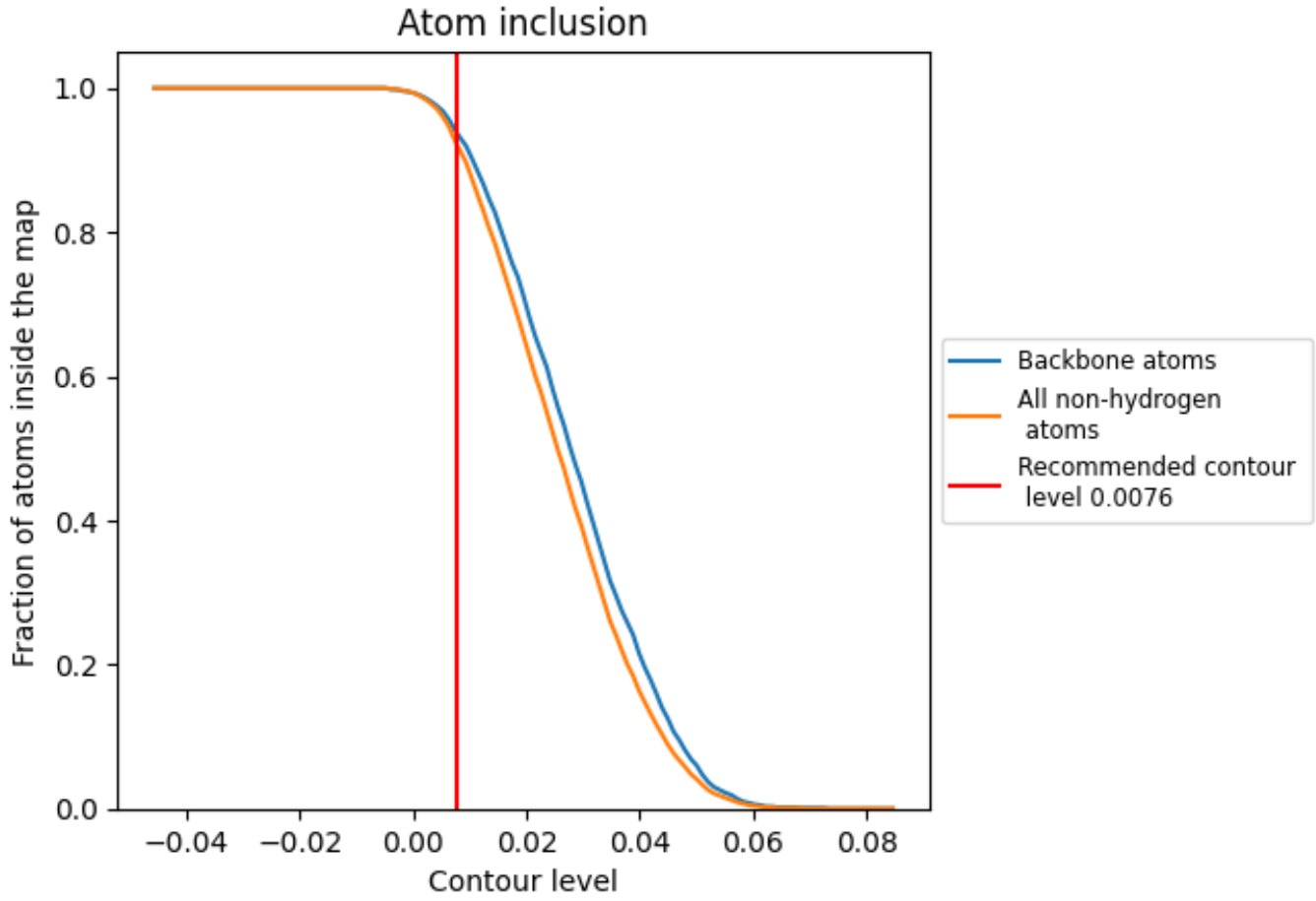
9.4 Atom inclusion (i)



At the recommended contour level, 94% of all backbone atoms, 92% of all non-hydrogen atoms, are inside the map.

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9.5 Map-model fit summary (i)

The table lists the average atom inclusion at the recommended contour level (0.0076) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.9230	0.5920
A	0.9400	0.6060
B	0.8860	0.5590
C	0.7850	0.5180
P	0.8930	0.5280
T	0.8960	0.5460

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