



## Full wwPDB EM Validation Report ⓘ

May 20, 2025 – 10:39 AM EDT

PDB ID : 9N36 / pdb\_00009n36  
EMDB ID : EMD-48846  
Title : CryoEM structure Of Respiratory Syncytial Virus Polymerase with novel non-nucleoside inhibitor compound 22  
Authors : Yin, Y.; Yu, X.; Kalin, J.H.; Tran, M.T.; Sharma, S.  
Deposited on : 2025-01-30  
Resolution : 2.72 Å(reported)

This is a Full wwPDB EM Validation Report for a publicly released PDB entry.

We welcome your comments at [validation@mail.wwpdb.org](mailto: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>.

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The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

EMDB validation analysis : 0.0.1.dev118  
Mogul : 2022.3.0, CSD as543be (2022)  
MolProbity : 4-5-2 with Phenix2.0rc1  
buster-report : 1.1.7 (2018)  
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) : 2.43.1

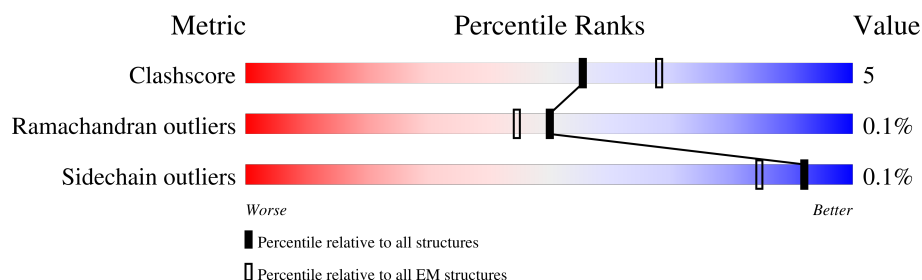
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*



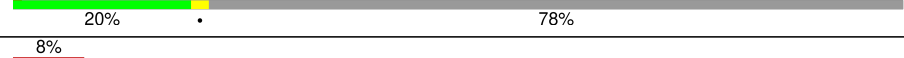
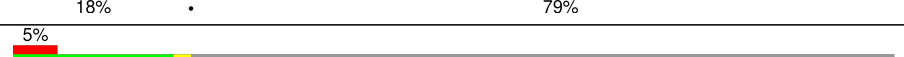

The reported resolution of this entry is 2.72 Å.

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

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  $\geq 3$ , 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	2201	
2	B	256	
2	C	256	
2	D	256	
2	E	256	

## 2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 13328 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 RNA-directed RNA polymerase L.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	1380	Total	C	N	O	S	0	0
			11258	7254	1888	2059	57		

There are 36 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-35	MET	-	initiating methionine	UNP P28887
A	-34	GLY	-	expression tag	UNP P28887
A	-33	SER	-	expression tag	UNP P28887
A	-32	TRP	-	expression tag	UNP P28887
A	-31	SER	-	expression tag	UNP P28887
A	-30	HIS	-	expression tag	UNP P28887
A	-29	PRO	-	expression tag	UNP P28887
A	-28	GLN	-	expression tag	UNP P28887
A	-27	PHE	-	expression tag	UNP P28887
A	-26	GLU	-	expression tag	UNP P28887
A	-25	LYS	-	expression tag	UNP P28887
A	-24	GLY	-	expression tag	UNP P28887
A	-23	SER	-	expression tag	UNP P28887
A	-22	GLY	-	expression tag	UNP P28887
A	-21	SER	-	expression tag	UNP P28887
A	-20	GLY	-	expression tag	UNP P28887
A	-19	SER	-	expression tag	UNP P28887
A	-18	SER	-	expression tag	UNP P28887
A	-17	TRP	-	expression tag	UNP P28887
A	-16	SER	-	expression tag	UNP P28887
A	-15	HIS	-	expression tag	UNP P28887
A	-14	PRO	-	expression tag	UNP P28887
A	-13	GLN	-	expression tag	UNP P28887
A	-12	PHE	-	expression tag	UNP P28887
A	-11	GLU	-	expression tag	UNP P28887
A	-10	LYS	-	expression tag	UNP P28887
A	-9	GLY	-	expression tag	UNP P28887
A	-8	SER	-	expression tag	UNP P28887

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Chain	Residue	Modelled	Actual	Comment	Reference
A	-7	GLY	-	expression tag	UNP P28887
A	-6	SER	-	expression tag	UNP P28887
A	-5	LEU	-	expression tag	UNP P28887
A	-4	VAL	-	expression tag	UNP P28887
A	-3	PRO	-	expression tag	UNP P28887
A	-2	ARG	-	expression tag	UNP P28887
A	-1	GLY	-	expression tag	UNP P28887
A	0	SER	-	expression tag	UNP P28887

- Molecule 2 is a protein called Phosphoprotein.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	98	Total	C	N	O	S	0	0
			761	461	137	157	6		
2	C	57	Total	C	N	O	S	0	0
			436	268	80	85	3		
2	D	55	Total	C	N	O	S	0	0
			423	259	78	83	3		
2	E	53	Total	C	N	O	S	0	0
			424	261	79	80	4		

There are 64 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	171	VAL	ILE	variant	UNP P03421
B	242	LYS	-	expression tag	UNP P03421
B	243	GLY	-	expression tag	UNP P03421
B	244	GLU	-	expression tag	UNP P03421
B	245	ASN	-	expression tag	UNP P03421
B	246	LEU	-	expression tag	UNP P03421
B	247	TYR	-	expression tag	UNP P03421
B	248	PHE	-	expression tag	UNP P03421
B	249	GLN	-	expression tag	UNP P03421
B	250	GLY	-	expression tag	UNP P03421
B	251	HIS	-	expression tag	UNP P03421
B	252	HIS	-	expression tag	UNP P03421
B	253	HIS	-	expression tag	UNP P03421
B	254	HIS	-	expression tag	UNP P03421
B	255	HIS	-	expression tag	UNP P03421
B	256	HIS	-	expression tag	UNP P03421
C	171	VAL	ILE	variant	UNP P03421
C	242	LYS	-	expression tag	UNP P03421

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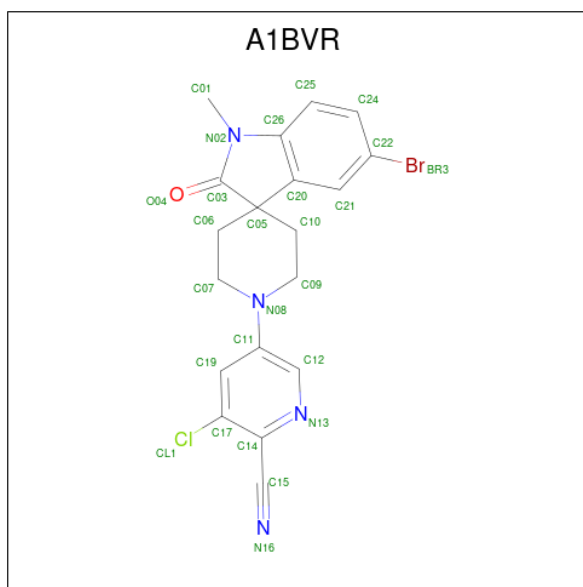
Chain	Residue	Modelled	Actual	Comment	Reference
C	243	GLY	-	expression tag	UNP P03421
C	244	GLU	-	expression tag	UNP P03421
C	245	ASN	-	expression tag	UNP P03421
C	246	LEU	-	expression tag	UNP P03421
C	247	TYR	-	expression tag	UNP P03421
C	248	PHE	-	expression tag	UNP P03421
C	249	GLN	-	expression tag	UNP P03421
C	250	GLY	-	expression tag	UNP P03421
C	251	HIS	-	expression tag	UNP P03421
C	252	HIS	-	expression tag	UNP P03421
C	253	HIS	-	expression tag	UNP P03421
C	254	HIS	-	expression tag	UNP P03421
C	255	HIS	-	expression tag	UNP P03421
C	256	HIS	-	expression tag	UNP P03421
D	171	VAL	ILE	variant	UNP P03421
D	242	LYS	-	expression tag	UNP P03421
D	243	GLY	-	expression tag	UNP P03421
D	244	GLU	-	expression tag	UNP P03421
D	245	ASN	-	expression tag	UNP P03421
D	246	LEU	-	expression tag	UNP P03421
D	247	TYR	-	expression tag	UNP P03421
D	248	PHE	-	expression tag	UNP P03421
D	249	GLN	-	expression tag	UNP P03421
D	250	GLY	-	expression tag	UNP P03421
D	251	HIS	-	expression tag	UNP P03421
D	252	HIS	-	expression tag	UNP P03421
D	253	HIS	-	expression tag	UNP P03421
D	254	HIS	-	expression tag	UNP P03421
D	255	HIS	-	expression tag	UNP P03421
D	256	HIS	-	expression tag	UNP P03421
E	171	VAL	ILE	variant	UNP P03421
E	242	LYS	-	expression tag	UNP P03421
E	243	GLY	-	expression tag	UNP P03421
E	244	GLU	-	expression tag	UNP P03421
E	245	ASN	-	expression tag	UNP P03421
E	246	LEU	-	expression tag	UNP P03421
E	247	TYR	-	expression tag	UNP P03421
E	248	PHE	-	expression tag	UNP P03421
E	249	GLN	-	expression tag	UNP P03421
E	250	GLY	-	expression tag	UNP P03421
E	251	HIS	-	expression tag	UNP P03421
E	252	HIS	-	expression tag	UNP P03421

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Chain	Residue	Modelled	Actual	Comment	Reference
E	253	HIS	-	expression tag	UNP P03421
E	254	HIS	-	expression tag	UNP P03421
E	255	HIS	-	expression tag	UNP P03421
E	256	HIS	-	expression tag	UNP P03421

- Molecule 3 is 5-(5-bromo-1-methyl-2-oxo-1,2-dihydrospiro[indole-3,4'-piperidin]-1'-yl)-3-chloropyridine-2-carbonitrile (CCD ID: A1BVR) (formula: C<sub>19</sub>H<sub>16</sub>BrClN<sub>4</sub>O) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms						AltConf
			Total	Br	C	Cl	N	O	
3	A	1	26	1	19	1	4	1	0



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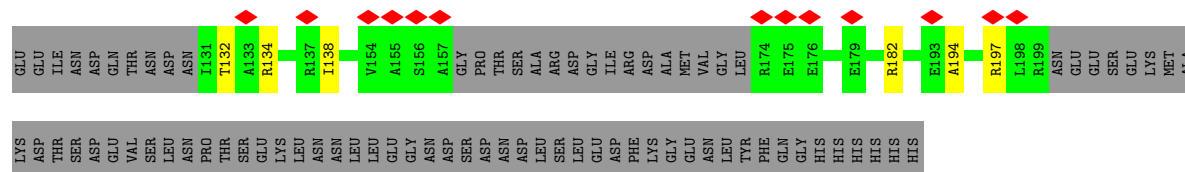
- Molecule 2: Phosphoprotein

[illegible]

- Molecule 2: Phosphoprotein

[illegible]





## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	1546578	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS GLACIOS	Depositor
Voltage (kV)	200	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	1	Depositor
Minimum defocus (nm)	600	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	FEI FALCON IV (4k x 4k)	Depositor
Maximum map value	2.998	Depositor
Minimum map value	-2.043	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.066	Depositor
Recommended contour level	0.245	Depositor
Map size (Å)	273.02402, 273.02402, 273.02402	wwPDB
Map dimensions	288, 288, 288	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.9480001, 0.9480001, 0.9480001	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: A1BVR

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	0.14	0/11493	0.34	0/15557
2	B	1.14	2/763 (0.3%)	2.28	6/1023 (0.6%)
2	C	0.31	0/437	0.58	2/586 (0.3%)
2	D	0.27	0/424	0.46	0/568
2	E	0.14	0/423	0.38	0/563
All	All	0.31	2/13540 (0.0%)	0.64	8/18297 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
2	B	0	1

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	167	ARG	C-N	-27.26	0.97	1.33
2	B	166	ILE	C-N	-14.74	1.14	1.33

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	167	ARG	O-C-N	-42.31	71.40	123.44
2	B	166	ILE	O-C-N	-32.38	90.11	123.14
2	B	166	ILE	CA-C-N	27.14	169.12	121.89
2	B	166	ILE	C-N-CA	27.14	169.12	121.89
2	B	167	ARG	CA-C-N	20.04	157.44	120.97
2	B	167	ARG	C-N-CA	20.04	157.44	120.97

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	171	VAL	N-CA-C	-6.90	107.15	113.71
2	C	172	GLY	CA-C-O	-6.56	117.95	122.22

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	B	166	ILE	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.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	11258	0	11462	103	0
2	B	761	0	776	19	0
2	C	436	0	457	6	0
2	D	423	0	441	8	0
2	E	424	0	450	7	0
3	A	26	0	0	0	0
All	All	13328	0	13586	128	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 5.

All (128) 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:1240:GLY:HA3	1:A:1412:LEU:O	1.81	0.80
1:A:1154:THR:HG22	1:A:1156:ALA:H	1.50	0.77
1:A:714:CYS:HA	1:A:717:SER:HB2	1.70	0.72
1:A:733:LEU:HD21	1:A:776:GLY:HA2	1.73	0.70
2:B:142:LEU:HD11	2:C:138:ILE:HG23	1.72	0.69
1:A:659:LEU:HD11	1:A:807:LEU:HD22	1.78	0.65
2:B:156:SER:O	2:B:167:ARG:NH1	2.31	0.64
2:B:217:ASN:H	2:B:220:SER:HB2	1.64	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:912:THR:O	1:A:925:SER:OG	2.18	0.61
1:A:1273:MET:HE3	1:A:1278:ARG:HH21	1.65	0.61
1:A:448:ASN:ND2	1:A:772:TYR:O	2.33	0.61
1:A:618:GLY:H	1:A:746:TYR:HE1	1.47	0.61
1:A:1193:SER:OG	1:A:1195:GLU:OE1	2.19	0.61
1:A:1110:ILE:HG22	1:A:1111:MET:HG2	1.82	0.61
2:B:137:ARG:HA	2:B:140:GLU:HG2	1.81	0.61
1:A:604:GLN:NE2	1:A:728:SER:OG	2.34	0.60
1:A:437:ARG:NH2	1:A:750:PRO:O	2.35	0.59
1:A:1399:VAL:O	1:A:1403:THR:OG1	2.19	0.59
1:A:533:LEU:HD23	1:A:536:ILE:HD11	1.85	0.59
1:A:671:LEU:HD23	1:A:874:GLN:HB2	1.83	0.59
1:A:913:GLN:HE22	1:A:995:ARG:HE	1.51	0.58
1:A:461:LEU:HD23	1:A:715:ILE:HD11	1.84	0.57
1:A:708:PHE:O	1:A:775:GLY:HA2	2.06	0.56
1:A:957:LYS:HA	1:A:960:LYS:HE3	1.87	0.56
1:A:995:ARG:NH1	1:A:999:ARG:O	2.38	0.56
1:A:436:GLU:HG2	1:A:746:TYR:CE1	2.41	0.55
1:A:982:PRO:HD3	1:A:1011:HIS:HD1	1.70	0.55
1:A:592:PHE:HD2	1:A:1092:ILE:HD13	1.72	0.54
1:A:993:LEU:HB2	1:A:1011:HIS:HD2	1.72	0.54
1:A:877:GLY:HA3	1:A:1256:ARG:HD2	1.89	0.54
2:B:201:GLU:HG2	2:B:202:GLU:H	1.72	0.54
1:A:652:LEU:HD11	1:A:783:LYS:HD3	1.89	0.54
2:D:136:ASP:O	2:D:140:GLU:HG3	2.09	0.53
1:A:1357:ARG:NH2	1:A:1400:GLU:OE1	2.42	0.53
1:A:1280:VAL:O	1:A:1455:GLN:NE2	2.36	0.52
1:A:1188:LYS:HE3	1:A:1190:GLU:HB3	1.91	0.52
1:A:555:ARG:O	1:A:563:GLN:NE2	2.42	0.52
1:A:1055:VAL:HG23	1:A:1107:LEU:HD23	1.91	0.52
1:A:665:LEU:O	1:A:669:LYS:HG2	2.10	0.51
1:A:759:ASP:HB3	1:A:762:ASN:HD22	1.75	0.51
1:A:741:THR:OG1	1:A:761:ASN:ND2	2.44	0.51
2:B:208:LYS:HA	2:B:211:SER:HB3	1.92	0.51
2:B:191:ARG:O	2:B:195:MET:HG3	2.10	0.51
1:A:1355:ALA:O	1:A:1358:THR:OG1	2.28	0.50
1:A:726:VAL:HG22	1:A:727:GLN:H	1.76	0.50
1:A:1059:ARG:NH2	1:A:1135:GLU:OE2	2.43	0.49
1:A:47:ASN:OD1	1:A:48:LEU:N	2.45	0.49
1:A:1240:GLY:CA	1:A:1412:LEU:O	2.56	0.49
1:A:324:PHE:HA	1:A:392:ILE:HD11	1.93	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1247:ASN:ND2	1:A:1360:ASN:OD1	2.45	0.49
1:A:1188:LYS:HG3	1:A:1190:GLU:O	2.12	0.49
2:D:173:LEU:HD11	2:E:182:ARG:HG3	1.95	0.49
1:A:842:LYS:HG2	2:B:210:THR:HB	1.95	0.48
1:A:1242:ILE:HB	1:A:1364:ASP:OD1	2.14	0.48
2:B:134:ARG:HH11	2:E:132:THR:HA	1.79	0.48
1:A:727:GLN:NE2	2:C:172:GLY:O	2.45	0.48
1:A:526:ARG:NH1	1:A:1458:GLU:OE1	2.47	0.48
1:A:1391:PHE:O	1:A:1395:LEU:HB2	2.13	0.48
1:A:489:LEU:HD22	1:A:493:TRP:HB3	1.96	0.48
2:B:217:ASN:O	2:B:221:GLU:HG3	2.12	0.47
1:A:796:ILE:HG12	1:A:847:GLU:HG3	1.95	0.47
2:C:136:ASP:OD1	2:D:134:ARG:NH2	2.47	0.47
2:B:201:GLU:HG2	2:B:202:GLU:N	2.29	0.47
1:A:434:VAL:HG21	1:A:627:ARG:HD3	1.96	0.47
1:A:727:GLN:HG2	2:C:174:ARG:HD3	1.97	0.46
1:A:845:TYR:HB3	2:B:206:MET:HE3	1.98	0.46
1:A:1079:LEU:O	1:A:1083:GLU:HG3	2.14	0.46
1:A:252:ILE:HG12	1:A:263:VAL:HG22	1.97	0.46
1:A:1368:ILE:HD11	1:A:1414:PRO:HG3	1.98	0.46
1:A:1377:GLY:O	1:A:1379:GLU:HG2	2.16	0.46
1:A:1244:GLU:HG3	1:A:1409:ARG:HG2	1.98	0.46
1:A:951:LEU:HD22	1:A:1173:ILE:HD12	1.97	0.45
2:C:185:ALA:HB2	2:D:178:ILE:HG13	1.98	0.45
2:E:134:ARG:O	2:E:138:ILE:HG13	2.16	0.45
1:A:317:GLY:HA3	1:A:429:PHE:CE1	2.51	0.45
1:A:362:ASN:HD21	2:B:216:LEU:HA	1.82	0.45
1:A:384:LEU:O	1:A:387:THR:OG1	2.35	0.45
1:A:1050:PRO:HG3	1:A:1212:SER:HB2	1.98	0.45
1:A:1055:VAL:O	1:A:1059:ARG:HG2	2.17	0.45
1:A:333:LYS:HB3	1:A:333:LYS:HE2	1.71	0.44
1:A:1064:LEU:O	1:A:1210:SER:OG	2.24	0.44
2:B:180:LYS:HE3	2:B:180:LYS:HB2	1.86	0.44
2:B:190:ASP:O	2:B:193:GLU:HG3	2.18	0.44
2:D:133:ALA:O	2:D:137:ARG:HG2	2.17	0.44
2:D:142:LEU:HD11	2:E:138:ILE:HG23	1.98	0.44
1:A:1340:LEU:HG	1:A:1342:VAL:HG23	1.99	0.44
1:A:1038:LYS:HG3	1:A:1185:ASN:HD21	1.83	0.44
1:A:1115:GLU:HB2	1:A:1116:PRO:HD3	1.99	0.44
1:A:305:PHE:CE1	1:A:422:LEU:HD13	2.53	0.44
1:A:1235:SER:HB3	1:A:1237:ILE:HG22	2.00	0.43

*Continued on next page...*

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:135:LEU:HD13	2:E:134:ARG:HD3	1.99	0.43
1:A:440:MET:SD	1:A:744:CYS:HB2	2.58	0.43
1:A:97:MET:HE1	1:A:205:ILE:HG22	2.01	0.43
1:A:1039:PHE:O	1:A:1043:ILE:HG12	2.18	0.43
1:A:1161:ASP:OD1	1:A:1164:ARG:NH2	2.45	0.43
1:A:804:ILE:HG23	1:A:815:ILE:HG23	2.00	0.43
2:B:134:ARG:NH1	2:E:132:THR:HA	2.33	0.43
1:A:672:GLU:OE2	1:A:1256:ARG:NH1	2.33	0.43
1:A:1126:TYR:OH	1:A:1135:GLU:OE1	2.36	0.43
1:A:468:ARG:HA	1:A:468:ARG:HD2	1.83	0.43
1:A:1036:LEU:HB3	1:A:1194:MET:HE1	2.01	0.43
2:E:194:ALA:O	2:E:197:ARG:HG2	2.19	0.43
1:A:452:PHE:HE1	2:B:186:LEU:HD13	1.84	0.42
1:A:1014:PHE:CE2	1:A:1225:MET:HE3	2.54	0.42
1:A:1106:ASP:O	1:A:1110:ILE:HG13	2.20	0.42
1:A:616:LEU:HB3	1:A:628:MET:HE3	2.00	0.42
1:A:1040:LEU:HD12	1:A:1194:MET:HE2	2.01	0.42
1:A:982:PRO:HD3	1:A:1011:HIS:ND1	2.34	0.42
1:A:797:SER:HB2	1:A:804:ILE:HD12	2.01	0.42
1:A:1280:VAL:HG12	1:A:1455:GLN:HG3	2.01	0.42
1:A:1259:THR:HG22	1:A:1260:LYS:N	2.35	0.42
2:C:153:VAL:HG22	2:D:152:LEU:HG	2.01	0.41
1:A:370:LYS:HE2	1:A:374:ASN:HD21	1.85	0.41
1:A:614:VAL:HG23	1:A:740:VAL:HG11	2.02	0.41
1:A:1166:THR:O	1:A:1170:ARG:HG3	2.20	0.41
1:A:49:ILE:HD12	1:A:49:ILE:HA	1.94	0.41
1:A:1435:LYS:HD3	1:A:1435:LYS:HA	1.83	0.41
1:A:115:ARG:HD2	1:A:115:ARG:HA	1.92	0.41
1:A:802:PHE:HE1	1:A:804:ILE:HD11	1.86	0.41
1:A:1366:SER:OG	1:A:1367:PRO:HD3	2.21	0.41
2:B:208:LYS:HZ1	2:B:215:SER:H	1.68	0.41
1:A:937:ILE:HD12	1:A:979:MET:SD	2.61	0.41
1:A:121:ASP:HA	1:A:190:LEU:HD12	2.02	0.40
1:A:360:MET:HE3	1:A:360:MET:HB3	2.01	0.40
1:A:427:ARG:HH11	1:A:885:LYS:HG2	1.86	0.40
1:A:1243:ILE:HB	1:A:1410:ILE:HG12	2.03	0.40
2:B:140:GLU:HG3	2:B:141:LYS:N	2.37	0.40
1:A:296:ASN:HB3	1:A:299:LEU:HB2	2.03	0.40

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	A	1372/2201 (62%)	1323 (96%)	48 (4%)	1 (0%)	48	72
2	B	96/256 (38%)	94 (98%)	2 (2%)	0	100	100
2	C	55/256 (22%)	53 (96%)	2 (4%)	0	100	100
2	D	53/256 (21%)	52 (98%)	1 (2%)	0	100	100
2	E	49/256 (19%)	48 (98%)	1 (2%)	0	100	100
All	All	1625/3225 (50%)	1570 (97%)	54 (3%)	1 (0%)	50	72

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	325	HIS

### 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	A	1281/2041 (63%)	1281 (100%)	0	100	100
2	B	85/233 (36%)	84 (99%)	1 (1%)	67	85
2	C	47/233 (20%)	47 (100%)	0	100	100
2	D	46/233 (20%)	46 (100%)	0	100	100
2	E	46/233 (20%)	46 (100%)	0	100	100
All	All	1505/2973 (51%)	1504 (100%)	1 (0%)	92	98



All (1) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	B	171	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (27) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	11	ASN
1	A	53	ASN
1	A	68	GLN
1	A	129	ASN
1	A	206	HIS
1	A	220	GLN
1	A	362	ASN
1	A	417	ASN
1	A	446	ASN
1	A	604	GLN
1	A	668	GLN
1	A	739	HIS
1	A	761	ASN
1	A	762	ASN
1	A	813	GLN
1	A	829	HIS
1	A	867	GLN
1	A	874	GLN
1	A	970	ASN
1	A	1185	ASN
1	A	1247	ASN
1	A	1288	GLN
1	A	1362	HIS
1	A	1420	HIS
1	A	1438	GLN
1	A	1443	GLN
2	B	224	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 [i](#)

There are no oligosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

1 ligand is modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z  > 2$	Counts	RMSZ	$\# Z  > 2$
3	A1BVR	A	2201	-	29,29,29	3.30	14 (48%)	40,44,44	2.87	13 (32%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	A1BVR	A	2201	-	-	0/4/38/38	0/4/4/4

All (14) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	2201	A1BVR	C03-N02	8.53	1.45	1.36
3	A	2201	A1BVR	C26-N02	7.06	1.52	1.39
3	A	2201	A1BVR	C10-C05	-6.79	1.45	1.54
3	A	2201	A1BVR	C06-C05	-6.32	1.46	1.54
3	A	2201	A1BVR	C05-C03	-4.87	1.47	1.53
3	A	2201	A1BVR	C14-C15	4.45	1.53	1.45
3	A	2201	A1BVR	C07-N08	3.34	1.52	1.46
3	A	2201	A1BVR	C09-N08	2.99	1.51	1.46
3	A	2201	A1BVR	C14-N13	-2.76	1.32	1.34
3	A	2201	A1BVR	C26-C20	2.67	1.42	1.39
3	A	2201	A1BVR	C11-N08	2.44	1.45	1.38
3	A	2201	A1BVR	C17-CL1	2.18	1.78	1.73
3	A	2201	A1BVR	O04-C03	-2.17	1.18	1.22

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	2201	A1BVR	BR3-C22	2.07	1.94	1.90

All (13) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	2201	A1BVR	C20-C05-C03	9.25	107.40	101.96
3	A	2201	A1BVR	C06-C05-C10	6.95	118.12	109.89
3	A	2201	A1BVR	C26-N02-C03	-6.39	108.00	111.28
3	A	2201	A1BVR	C12-N13-C14	5.89	122.07	116.97
3	A	2201	A1BVR	C06-C05-C20	-5.72	94.10	112.27
3	A	2201	A1BVR	C07-C06-C05	3.67	117.93	112.74
3	A	2201	A1BVR	C20-C26-N02	-2.96	107.84	109.85
3	A	2201	A1BVR	C01-N02-C03	2.84	126.20	123.59
3	A	2201	A1BVR	C07-N08-C11	2.27	124.31	118.11
3	A	2201	A1BVR	C09-N08-C07	-2.27	106.46	111.57
3	A	2201	A1BVR	C15-C14-N13	2.23	119.45	115.23
3	A	2201	A1BVR	C10-C05-C20	-2.10	105.62	112.27
3	A	2201	A1BVR	C09-C10-C05	2.00	115.57	112.74

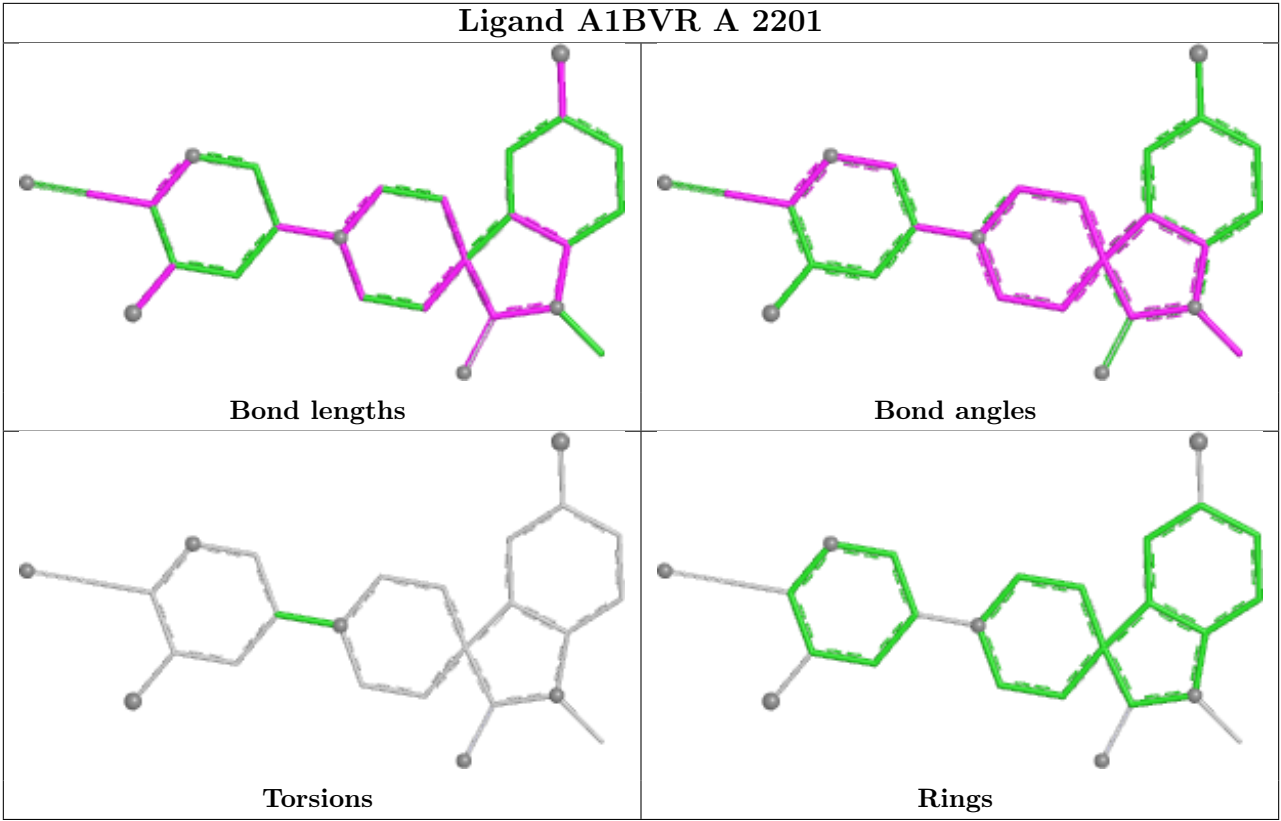
There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

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 ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

The following chains have linkage breaks:

Mol	Chain	Number of breaks
2	B	2

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	B	166:ILE	C	167:ARG	N	1.14
1	B	167:ARG	C	168:ASP	N	0.97

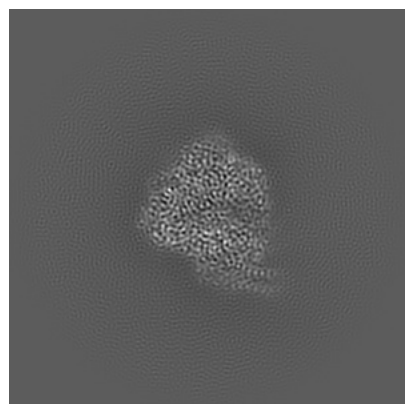
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-48846. These allow visual inspection of the internal detail of the map and identification of artifacts.

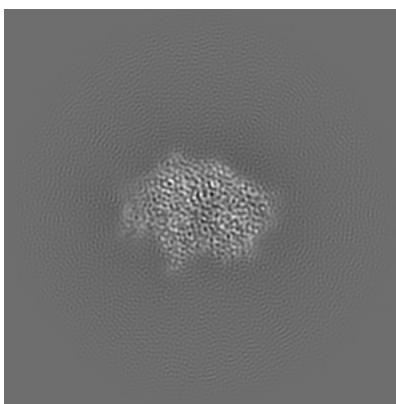
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

### 6.1 Orthogonal projections [i](#)

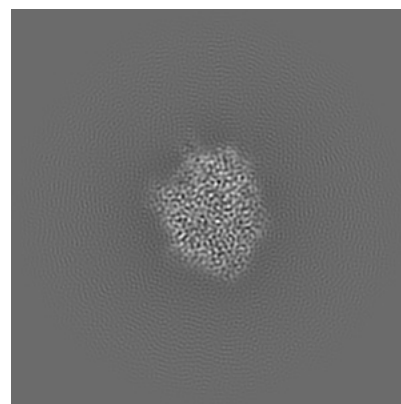
#### 6.1.1 Primary map



X

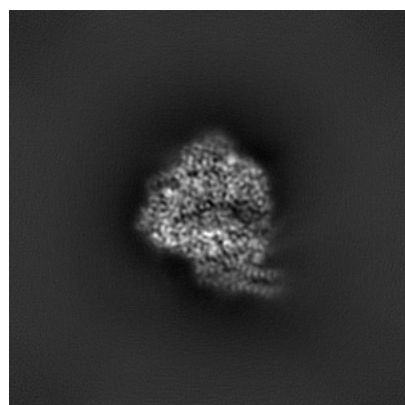


Y

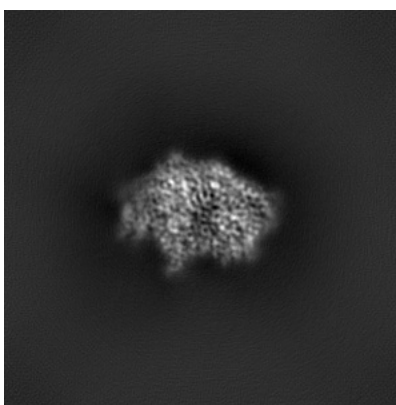


Z

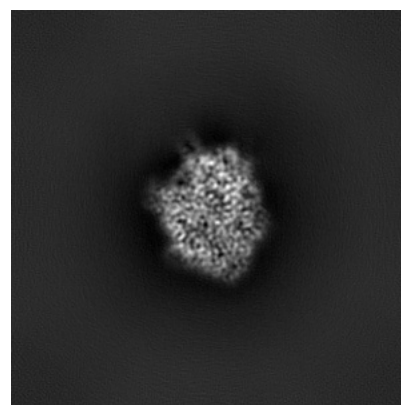
#### 6.1.2 Raw map



X



Y

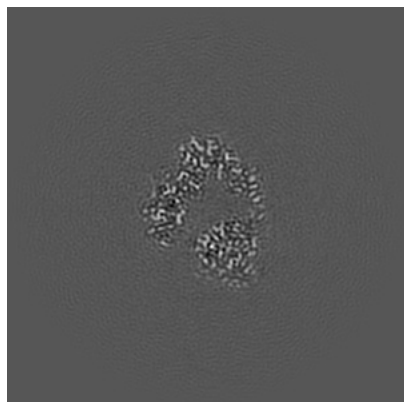


Z

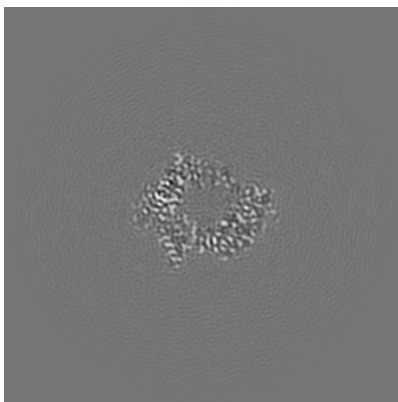
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices [i](#)

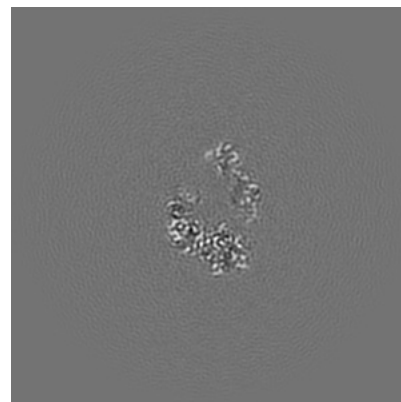
### 6.2.1 Primary map



X Index: 144

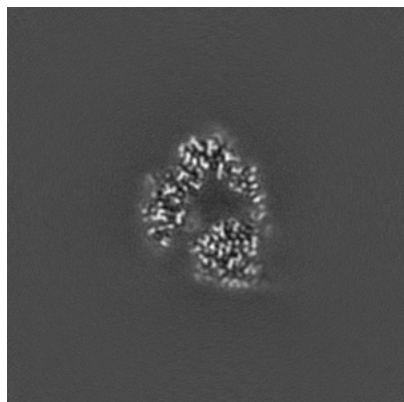


Y Index: 144

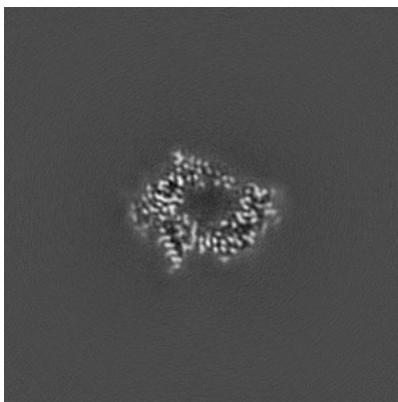


Z Index: 144

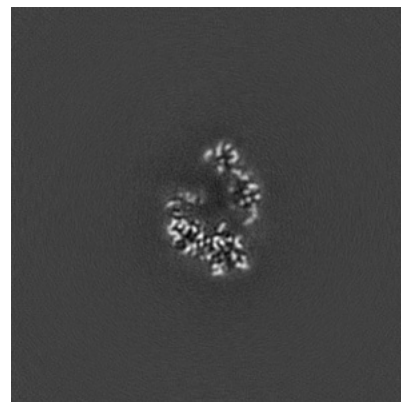
### 6.2.2 Raw map



X Index: 144



Y Index: 144

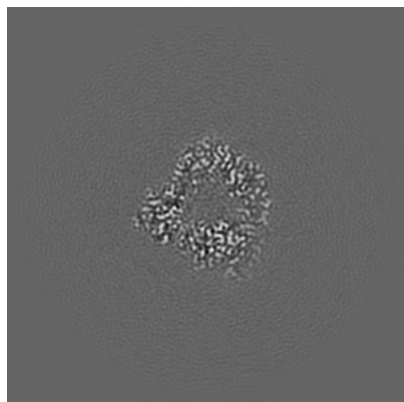


Z Index: 144

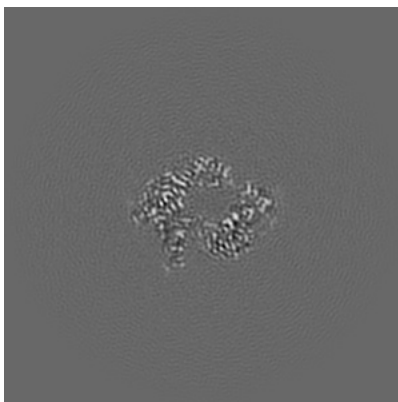
The images above show central slices of the map in three orthogonal directions.

## 6.3 Largest variance slices [i](#)

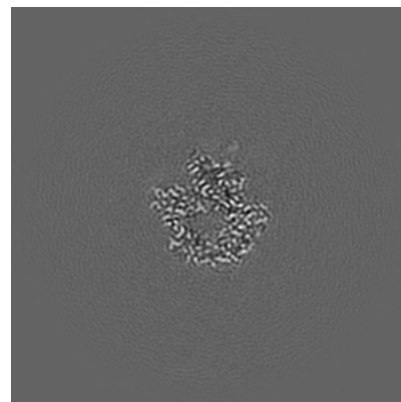
### 6.3.1 Primary map



X Index: 155

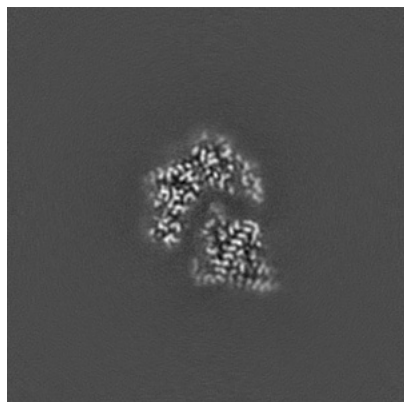


Y Index: 150

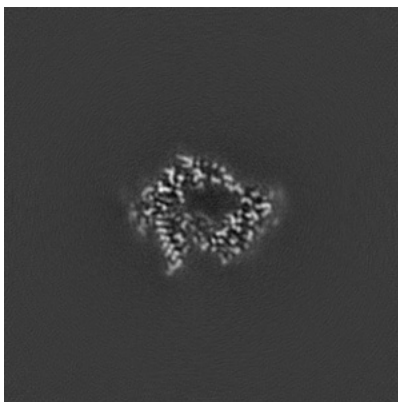


Z Index: 125

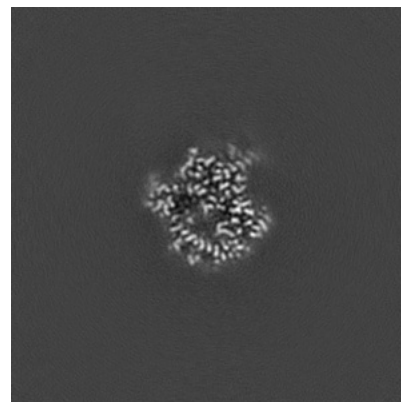
### 6.3.2 Raw map



X Index: 137



Y Index: 146



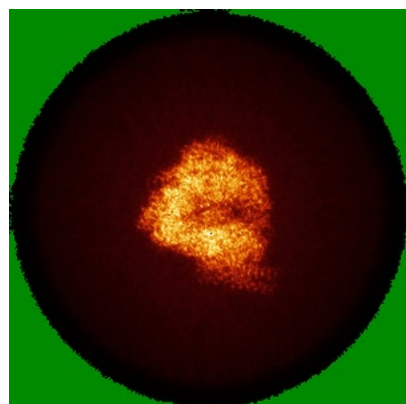
Z Index: 121

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

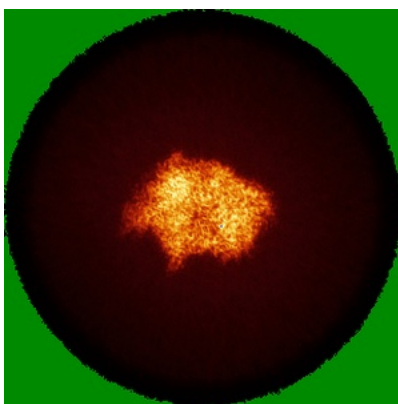


## 6.4 Orthogonal standard-deviation projections (False-color) [i](#)

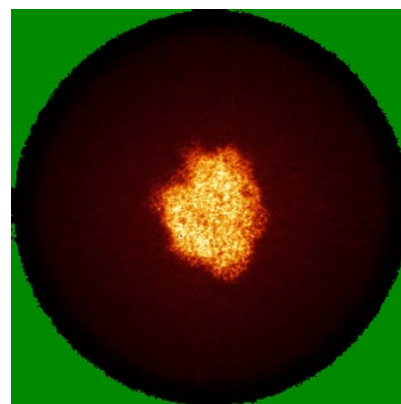
### 6.4.1 Primary map



X

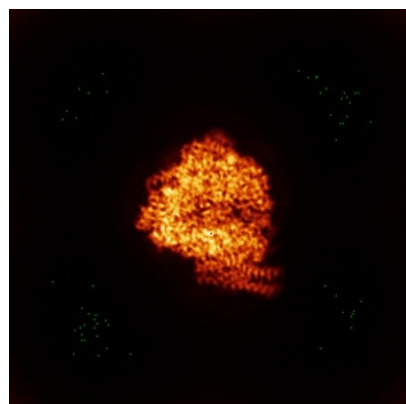


Y

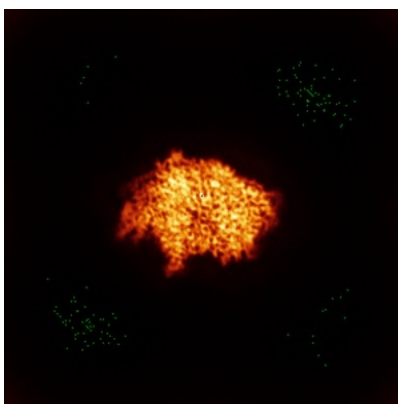


Z

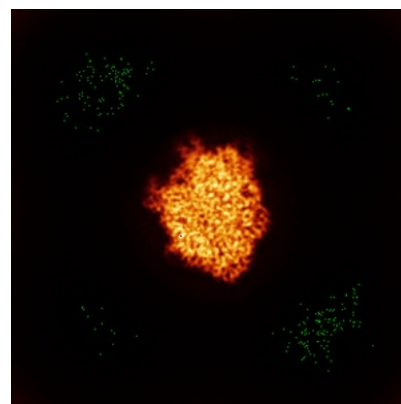
### 6.4.2 Raw map



X



Y



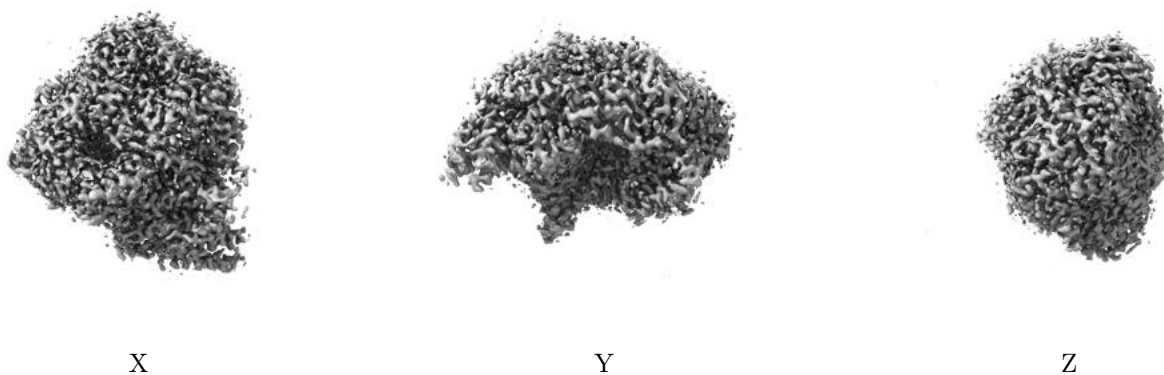
Z

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.



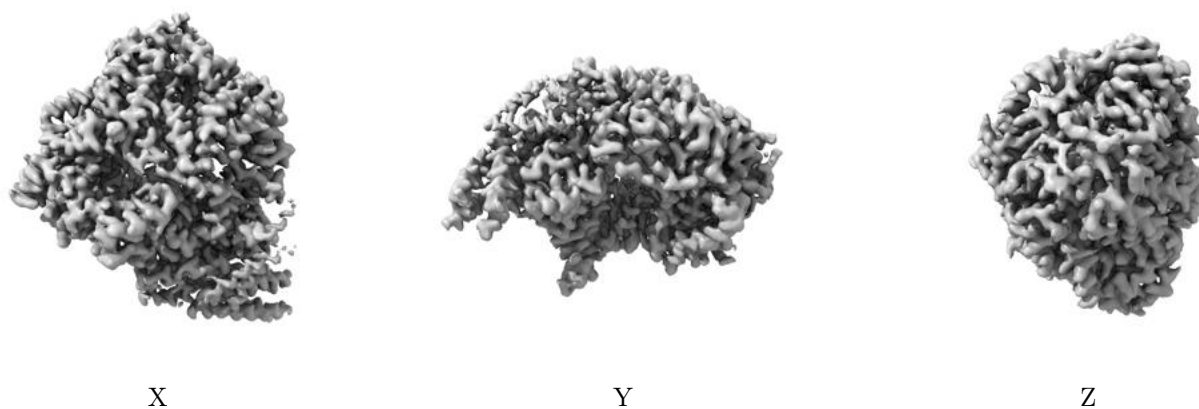
## 6.5 Orthogonal surface views [i](#)

### 6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.245. 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.

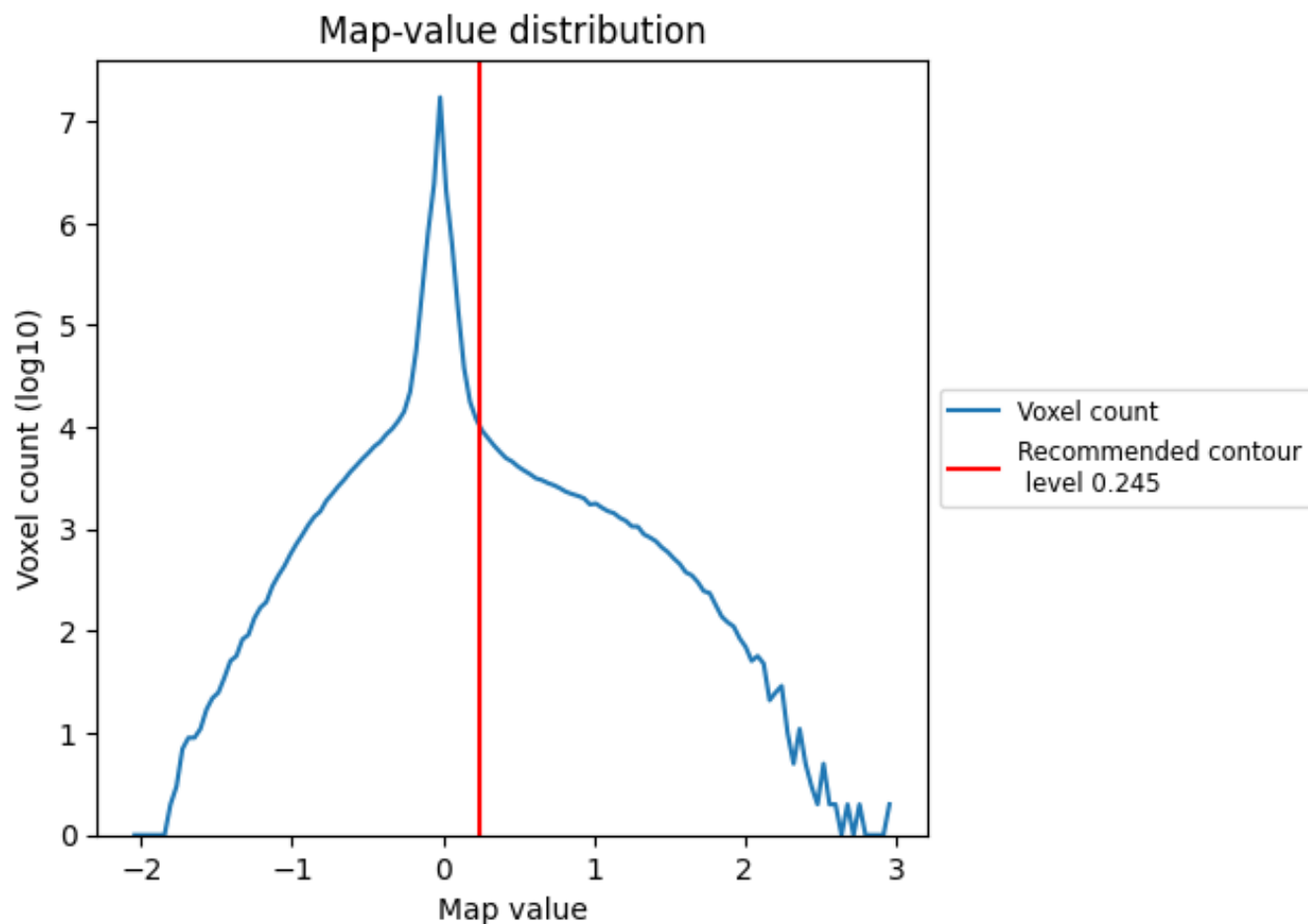
## 6.6 Mask visualisation [i](#)

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

## 7 Map analysis [i](#)

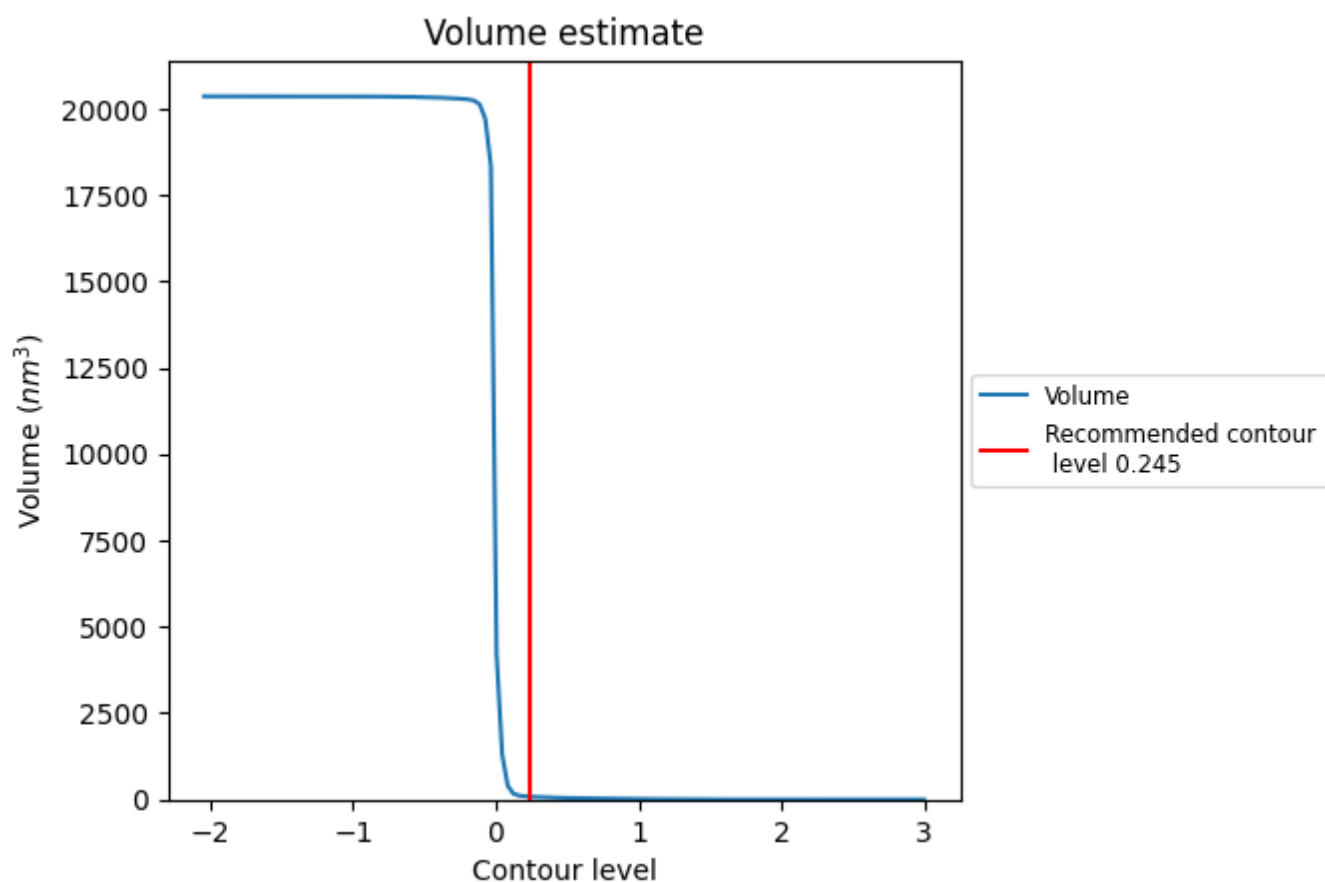
This section contains the results of statistical analysis of the map.

### 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.

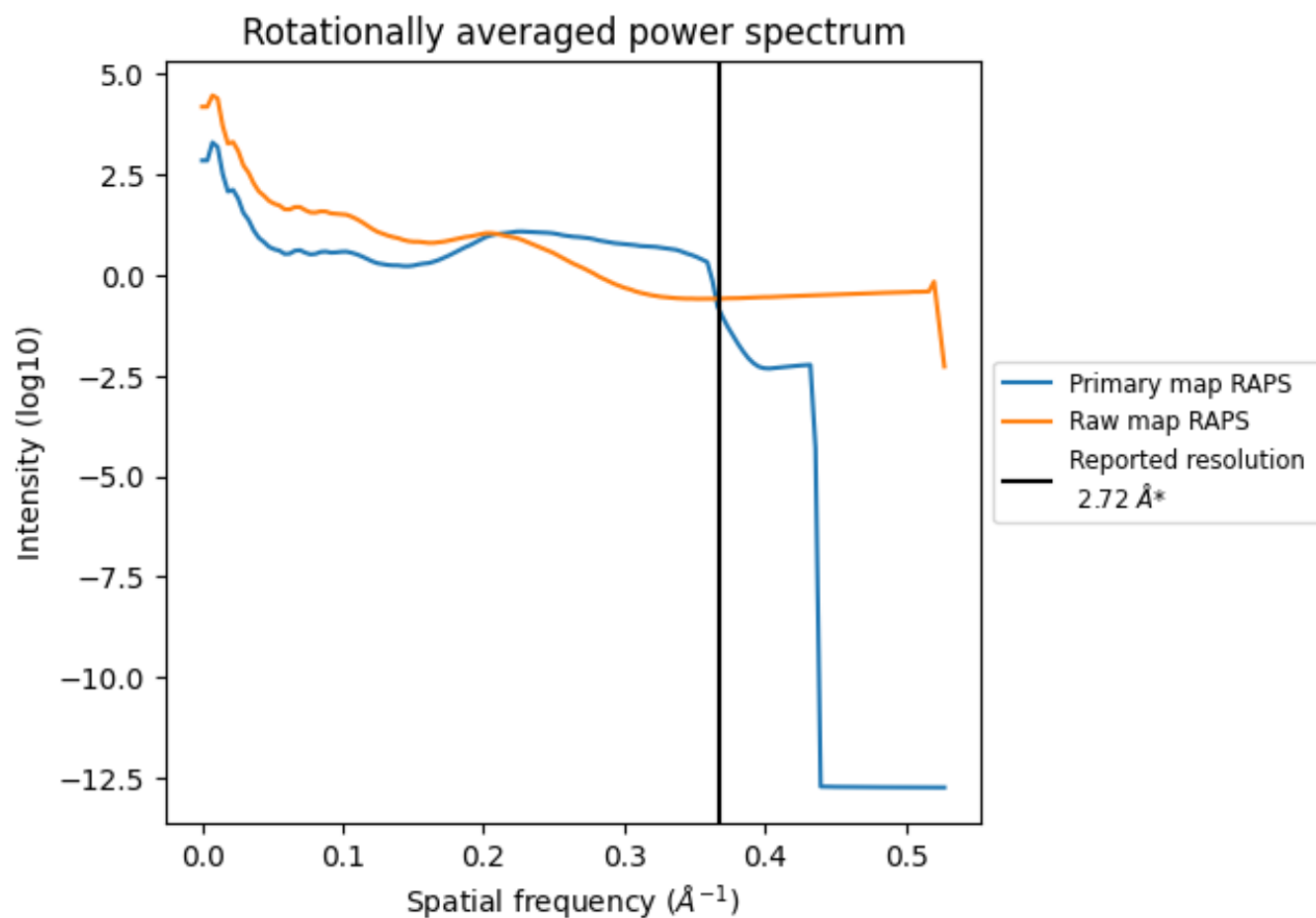
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 83 nm<sup>3</sup>; this corresponds to an approximate mass of 75 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 ⓘ

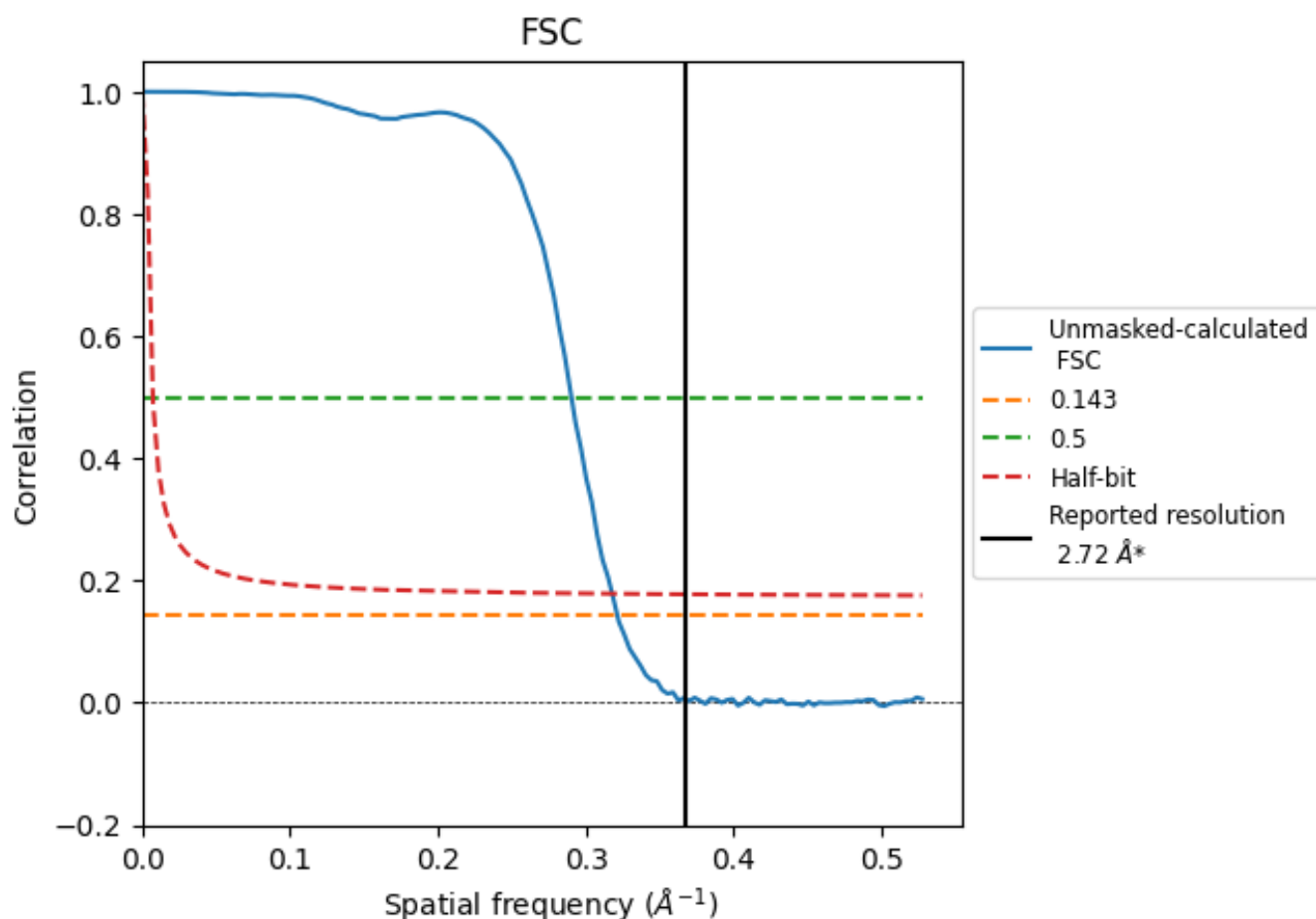


\*Reported resolution corresponds to spatial frequency of 0.368  $\text{\AA}^{-1}$

## 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 0.368  $\text{\AA}^{-1}$

## 8.2 Resolution estimates [i](#)

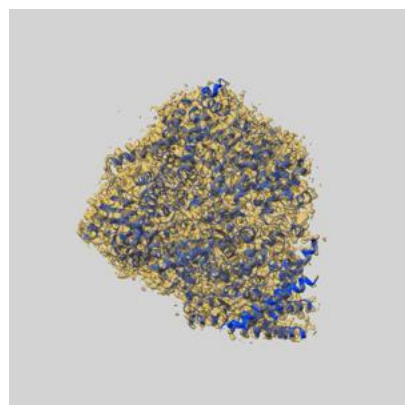
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.72	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	3.11	3.45	3.15

\*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 3.11 differs from the reported value 2.72 by more than 10 %

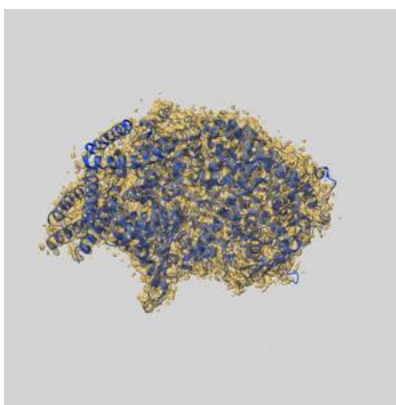
## 9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-48846 and PDB model 9N36. Per-residue inclusion information can be found in section [3](#) on page [7](#).

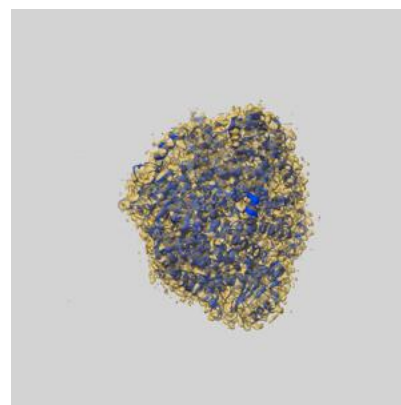
### 9.1 Map-model overlay [i](#)



X



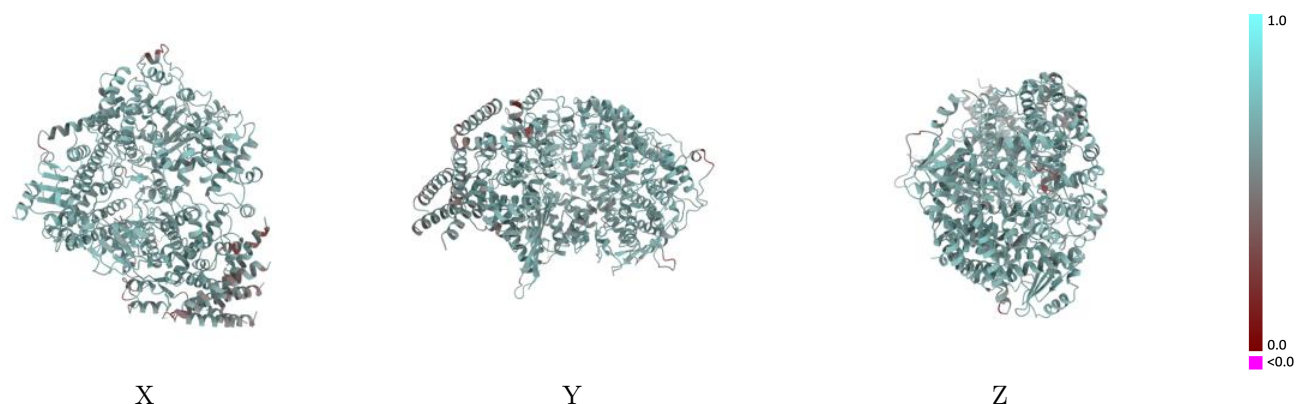
Y



Z

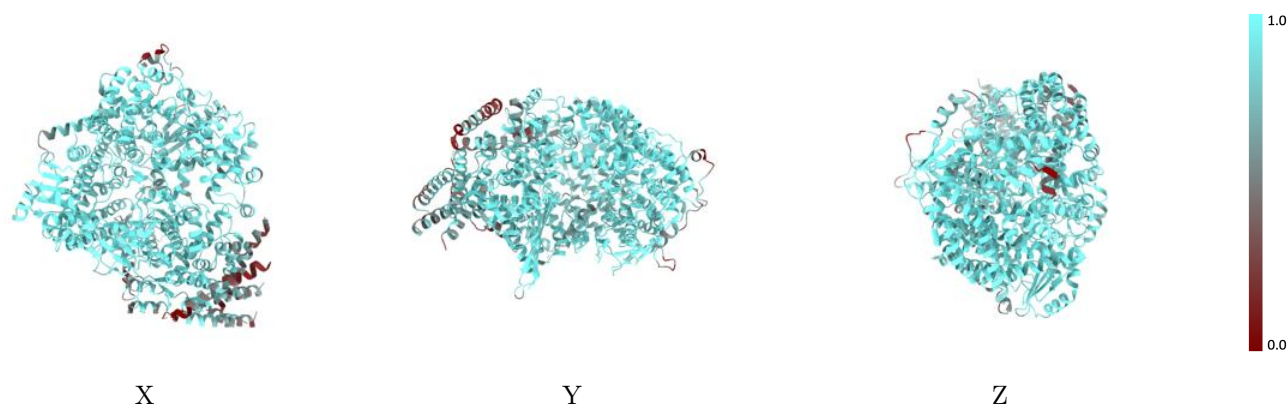
The images above show the 3D surface view of the map at the recommended contour level 0.245 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

## 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.

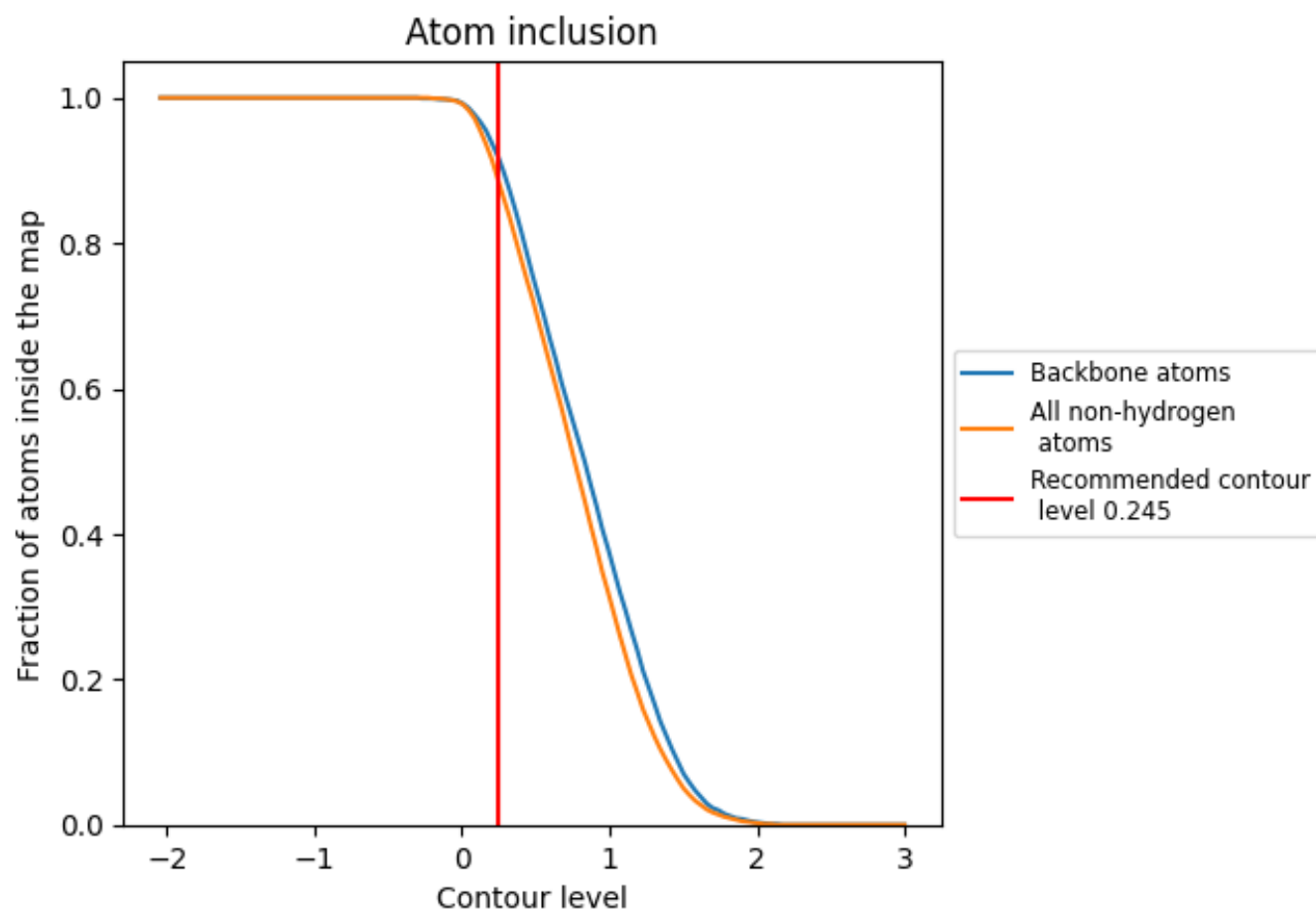
## 9.3 Atom inclusion mapped to coordinate model [i](#)



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 (0.245).



## 9.4 Atom inclusion [i](#)



At the recommended contour level, 92% of all backbone atoms, 89% 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 (0.245) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	<div></div> 0.8870	<div></div> 0.6150
A	<div></div> 0.9250	<div></div> 0.6270
B	<div></div> 0.7120	<div></div> 0.5610
C	<div></div> 0.8160	<div></div> 0.5790
D	<div></div> 0.5550	<div></div> 0.5160
E	<div></div> 0.5880	<div></div> 0.5230

