



# Full wwPDB EM Validation Report ⓘ

Oct 14, 2024 – 09:57 PM EDT

PDB ID : 8G7U  
EMDB ID : EMD-29824  
Title : Cryo-EM structure of Riplet:RIG-I:dsRNA complex (end-semi-closed end)  
Authors : Wang, W.; Pyle, A.M.  
Deposited on : 2023-02-17  
Resolution : 4.00 Å (reported)  
Based on initial model : 8G7T

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>.

---

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

EMDB validation analysis : 0.0.1.dev113  
Mogul : 2022.3.0, CSD as543be (2022)  
MolProbity : 4.02b-467  
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) : 2.39

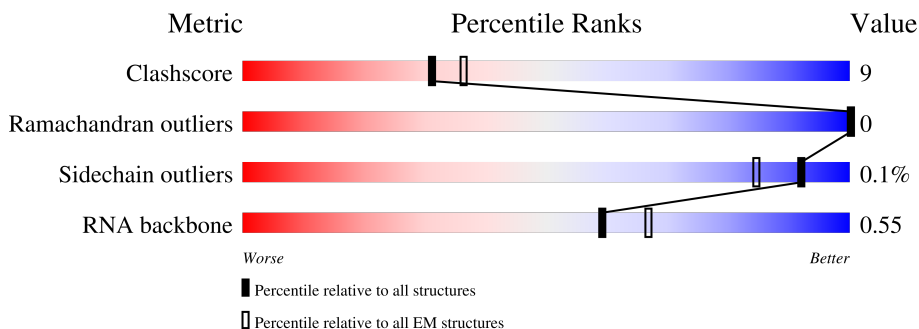
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 4.00 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	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  $\geq 3$ , 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	925	
1	C	925	
2	B	432	
2	D	432	
3	X	24	
4	Y	24	

## 2 Entry composition [i](#)

There are 5 unique types of molecules in this entry. The entry contains 14229 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 Antiviral innate immune response receptor RIG-I.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	647	Total	C	N	O	S	0	0
			5234	3354	888	960	32		
1	C	631	Total	C	N	O	S	0	0
			5115	3282	863	940	30		

- Molecule 2 is a protein called E3 ubiquitin-protein ligase RNF135.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	178	Total	C	N	O	S	0	0
			1424	904	247	263	10		
2	D	178	Total	C	N	O	S	0	0
			1415	899	245	263	8		

- Molecule 3 is a RNA chain called p3dsRNA24a.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
3	X	24	Total	C	N	O	P	0	0
			523	229	92	176	26		

- Molecule 4 is a RNA chain called p3dsRNA24b.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
4	Y	24	Total	C	N	O	P	0	0
			516	227	89	174	26		

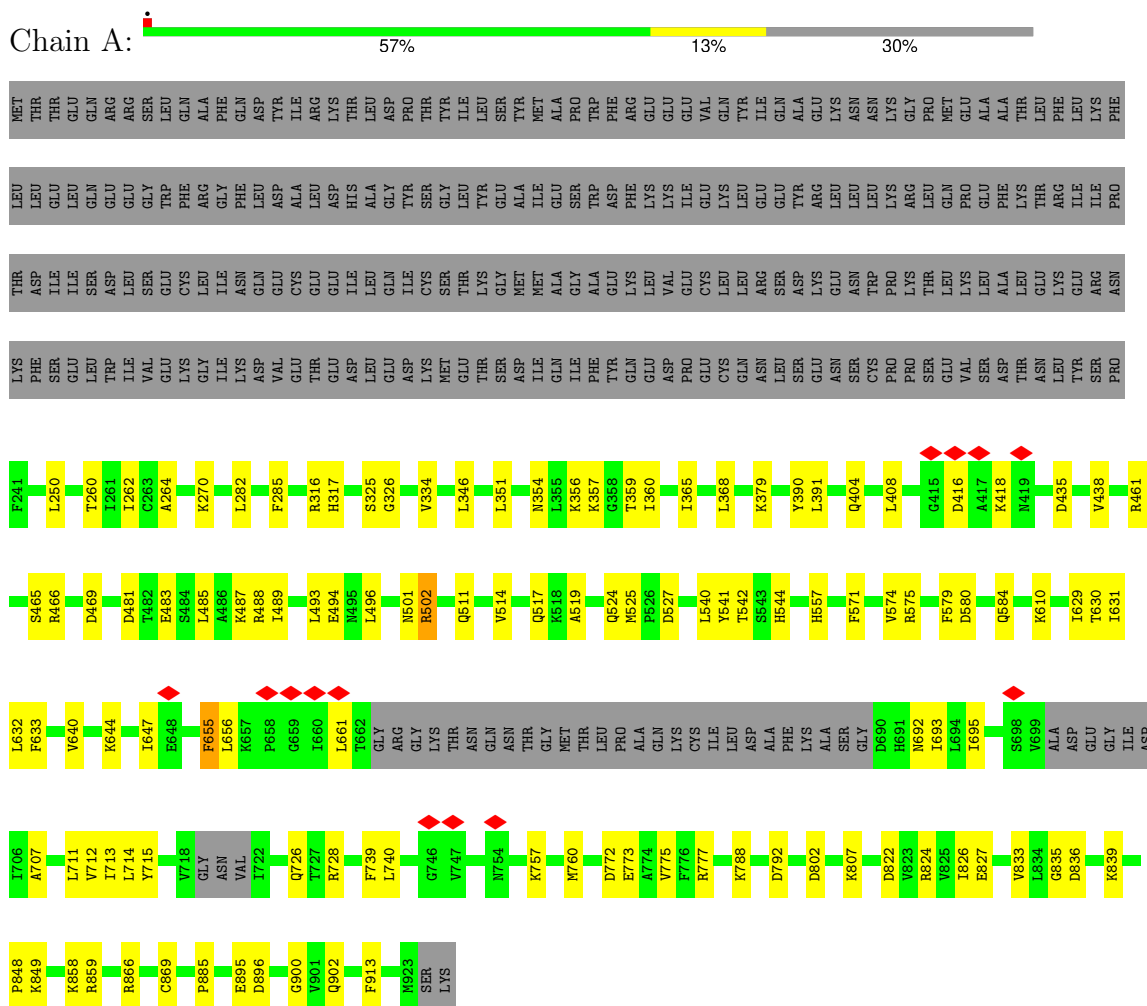
- Molecule 5 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
5	A	1	Total	Zn	0
			1	1	
5	C	1	Total	Zn	0
			1	1	

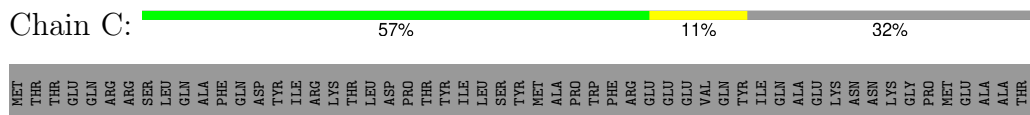
### 3 Residue-property plots [i](#)

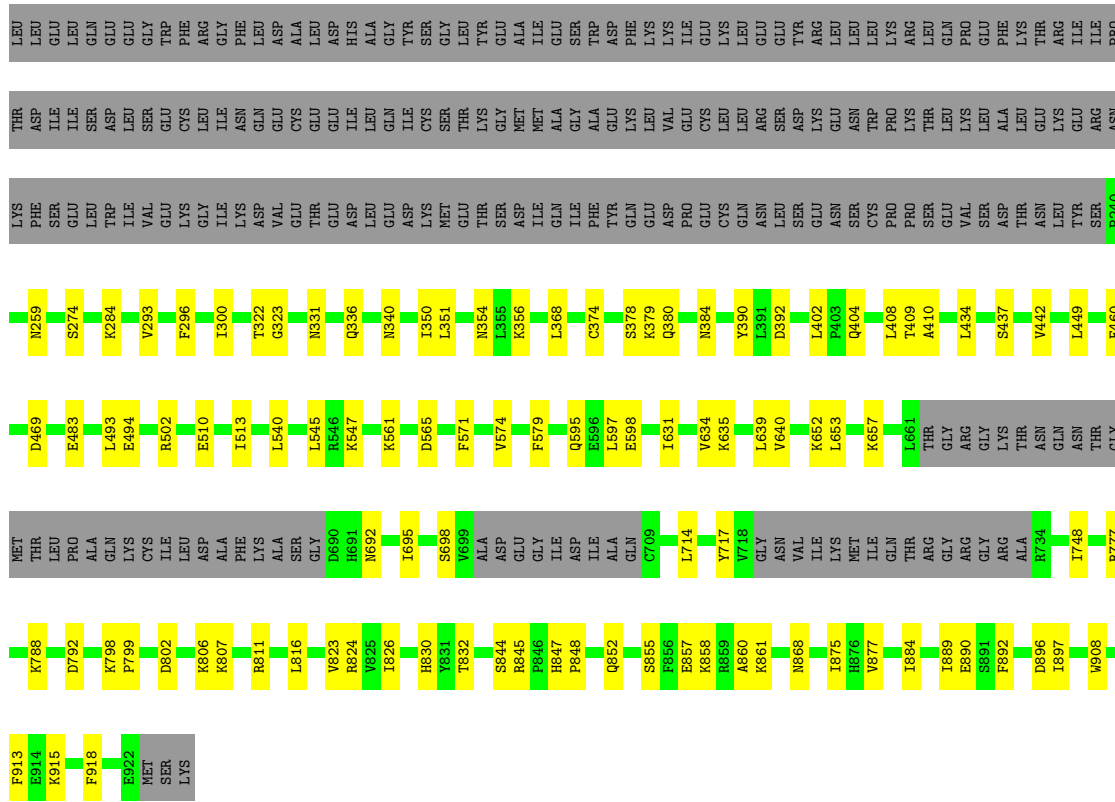
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion 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: Antiviral innate immune response receptor RIG-I

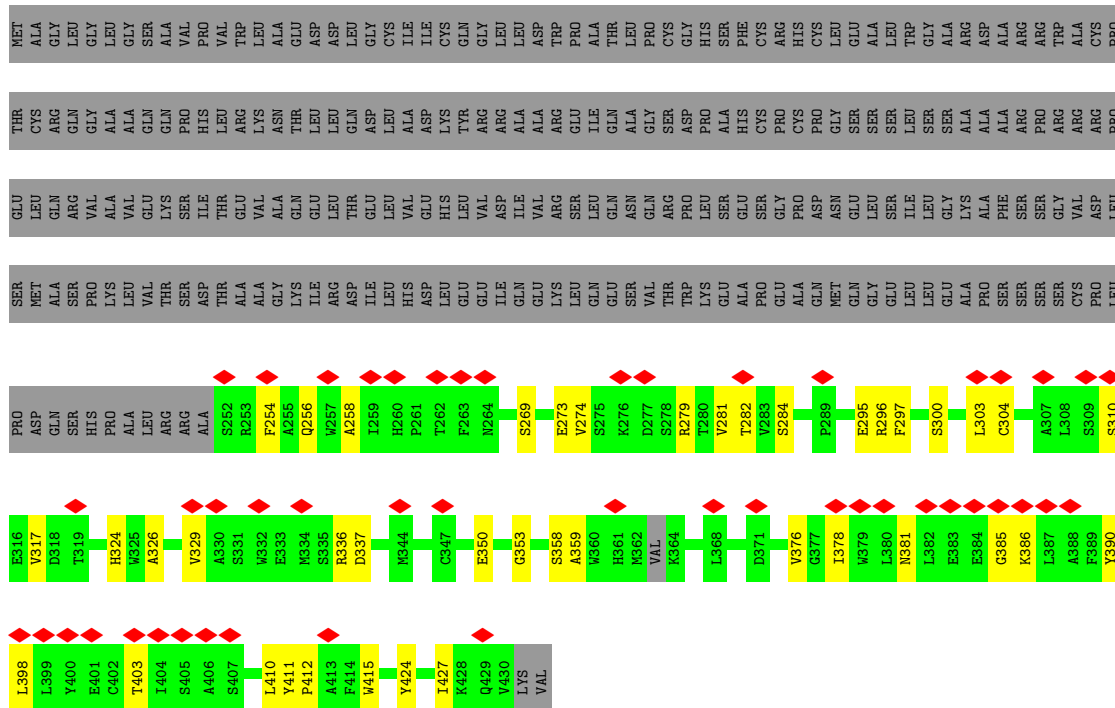
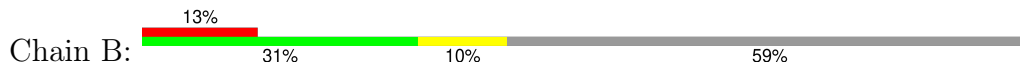


- Molecule 1: Antiviral innate immune response receptor RIG-I





• Molecule 2: E3 ubiquitin-protein ligase RNF135



• Molecule 2: E3 ubiquitin-protein ligase RNF135

Chain D: 34% 7% 59%

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

S391	S991
V392	V392
D393	D393
N394	N394
Y411	Y411
L425	L425
V430	V430
VAL	VAL

• Molecule 3: p3dsRNA24a

Chain X: 29% 67%

G1	G1
G2	G2
A3	A3
C4	C4
G5	G5
U6	U6
A7	A7
C8	C8
U10	U10
C13	C13
G14	G14
C15	C15
G16	G16
G20	G20
U21	U21
A22	A22
G23	G23
A24	A24

• Molecule 4: p3dsRNA24b

Chain Y: 50% 50%

UTP1	UTP1
C2	C2
C5	C5
A6	A6
G7	G7
U8	U8
G12	G12
C16	C16
G17	G17
C20	C20
G21	G21
U22	U22
C23	C23
C24	C24

## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	68414	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	60	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.072	Depositor
Minimum map value	-0.035	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.002	Depositor
Recommended contour level	0.005	Depositor
Map size ( $\text{\AA}$ )	221.496, 221.496, 221.496	wwPDB
Map dimensions	264, 264, 264	wwPDB
Map angles ( $^\circ$ )	90.0, 90.0, 90.0	wwPDB
Pixel spacing ( $\text{\AA}$ )	0.839, 0.839, 0.839	Depositor

## 5 Model quality

### 5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: GTP, UTP, 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	A	0.31	0/5341	0.55	0/7198
1	C	0.43	0/5223	0.55	0/7042
2	B	0.28	0/1465	0.59	0/1991
2	D	0.35	0/1455	0.59	0/1980
3	X	0.83	0/548	1.10	0/852
4	Y	0.82	0/543	1.20	0/843
All	All	0.42	0/14575	0.63	0/19906

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

### 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	5234	0	5287	76	0
1	C	5115	0	5156	76	0
2	B	1424	0	1363	28	0
2	D	1415	0	1351	20	0
3	X	523	0	258	22	0
4	Y	516	0	260	22	0
5	A	1	0	0	0	0

*Continued on next page...*



*Continued from previous page...*

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	C	1	0	0	0	0
All	All	14229	0	13675	236	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 9.

All (236) 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)
4:Y:1:UTP:O2'	4:Y:2:C:P	2.07	1.10
2:B:304:CYS:SG	2:B:412:PRO:HD2	2.06	0.94
1:A:633:PHE:O	1:A:714:LEU:HA	1.71	0.91
1:C:634:VAL:HG12	1:C:635:LYS:H	1.47	0.80
1:C:631:ILE:HG22	1:C:631:ILE:O	1.81	0.79
1:C:634:VAL:HG12	1:C:635:LYS:N	2.00	0.76
1:C:634:VAL:HG11	1:C:639:LEU:HB3	1.67	0.76
4:Y:1:UTP:N3	4:Y:2:C:N4	2.34	0.75
4:Y:1:UTP:O2'	4:Y:2:C:OP2	2.06	0.74
4:Y:1:UTP:C2	4:Y:2:C:C4	2.75	0.74
4:Y:1:UTP:O2	4:Y:2:C:C4	2.41	0.73
4:Y:1:UTP:C2	4:Y:2:C:N4	2.58	0.71
2:B:326:ALA:HB3	2:B:415:TRP:HB3	1.74	0.69
1:A:896:ASP:HB3	1:A:900:GLY:H	1.58	0.67
3:X:13:C:H2'	3:X:14:G:C8	2.30	0.66
1:C:634:VAL:CG1	1:C:635:LYS:H	2.08	0.66
4:Y:2:C:H6	4:Y:2:C:O5'	1.78	0.66
3:X:1:GTP:C5'	3:X:2:G:OP2	2.44	0.66
4:Y:1:UTP:C2	4:Y:2:C:C5	2.85	0.65
1:A:631:ILE:O	1:A:712:VAL:HA	1.97	0.65
4:Y:6:A:H2'	4:Y:7:G:C8	2.31	0.64
1:A:661:LEU:HG	1:A:661:LEU:O	1.98	0.64
3:X:15:C:H2'	3:X:16:G:C8	2.33	0.63
4:Y:1:UTP:O2'	4:Y:2:C:C5	2.53	0.62
1:A:485:LEU:HD11	1:A:541:TYR:HE1	1.62	0.62
1:A:485:LEU:HD11	1:A:541:TYR:CE1	2.35	0.62
3:X:4:C:H2'	3:X:5:G:H8	1.64	0.61
2:B:254:PHE:O	2:B:256:GLN:NE2	2.34	0.61
4:Y:1:UTP:HA	4:Y:2:C:H5	1.47	0.61
3:X:21:U:H6	3:X:21:U:O5'	1.84	0.60
2:D:269:SER:HB3	2:D:297:PHE:HB2	1.83	0.60
1:A:836:ASP:O	1:A:839:LYS:HB2	2.01	0.59

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:437:SER:OG	1:C:777:ARG:NH2	2.35	0.59
1:C:807:LYS:HD2	1:C:816:LEU:HD11	1.85	0.59
1:A:487:LYS:HG2	1:A:493:LEU:HD21	1.85	0.59
2:D:273:GLU:HG2	2:D:284:SER:HB2	1.84	0.59
1:A:346:LEU:HD11	1:A:351:LEU:HB2	1.83	0.58
1:C:788:LYS:O	1:C:792:ASP:HB2	2.04	0.58
1:C:823:VAL:O	1:C:824:ARG:NH1	2.36	0.58
1:A:632:LEU:HB2	1:A:695:ILE:HG13	1.85	0.58
1:A:647:ILE:HG13	1:A:693:ILE:HD13	1.86	0.58
4:Y:1:UTP:O2	4:Y:2:C:C5	2.57	0.57
1:C:579:PHE:O	1:C:868:ASN:ND2	2.37	0.57
1:A:270:LYS:HG2	1:A:408:LEU:HD11	1.86	0.57
3:X:7:A:H2'	3:X:8:C:C6	2.39	0.57
1:A:773:GLU:OE1	1:A:777:ARG:NH1	2.38	0.57
1:A:496:LEU:HG	1:A:519:ALA:HB1	1.86	0.56
1:C:807:LYS:HE2	1:C:897:ILE:HG12	1.86	0.56
3:X:2:G:H2'	3:X:3:A:H8	1.70	0.56
1:C:640:VAL:HG22	1:C:695:ILE:HG22	1.86	0.56
2:D:286:ARG:O	2:D:288:GLN:NE2	2.38	0.56
1:A:714:LEU:O	1:A:740:LEU:HA	2.05	0.56
1:C:830:HIS:CD2	4:Y:2:C:H1'	2.41	0.56
2:D:313:HIS:HB2	2:D:380:LEU:HD22	1.88	0.56
1:C:802:ASP:OD2	1:C:806:LYS:NZ	2.36	0.56
1:A:418:LYS:O	1:A:757:LYS:NZ	2.35	0.55
1:A:629:ILE:HG12	1:A:692:ASN:HA	1.88	0.55
3:X:15:C:H2'	3:X:16:G:H8	1.69	0.55
1:C:378:SER:O	1:C:384:ASN:ND2	2.40	0.55
4:Y:1:UTP:O2'	4:Y:2:C:H5	1.89	0.55
1:C:409:THR:OG1	1:C:410:ALA:N	2.40	0.55
1:C:595:GLN:NE2	1:C:598:GLU:OE2	2.40	0.55
3:X:21:U:H2'	3:X:22:A:C8	2.41	0.54
1:C:336:GLN:O	1:C:340:ASN:HB2	2.08	0.54
1:C:698:SER:HG	1:C:717:TYR:HH	1.52	0.54
1:C:806:LYS:HG3	1:C:896:ASP:HA	1.88	0.54
2:D:391:SER:H	2:D:394:ASN:HD21	1.55	0.54
1:C:378:SER:OG	1:C:379:LYS:N	2.40	0.53
1:C:483:GLU:OE2	1:C:502:ARG:NH2	2.35	0.53
1:C:322:THR:OG1	1:C:323:GLY:N	2.41	0.53
1:A:630:THR:HA	1:A:711:LEU:HB3	1.90	0.53
2:D:263:PHE:HA	2:D:304:CYS:HA	1.90	0.53
1:A:494:GLU:OE2	1:A:502:ARG:NH2	2.40	0.53

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:655:PHE:O	1:A:692:ASN:ND2	2.41	0.53
2:D:291:ARG:NH2	2:D:292:TRP:O	2.41	0.53
2:B:295:GLU:OE1	2:B:336:ARG:NH2	2.42	0.53
1:C:469:ASP:OD1	1:C:469:ASP:N	2.40	0.53
1:C:858:LYS:HG3	1:C:875:ILE:HD12	1.91	0.53
1:A:325:SER:OG	1:A:326:GLY:N	2.40	0.53
1:C:494:GLU:OE2	1:C:502:ARG:NH1	2.42	0.53
1:A:833:VAL:HG12	1:A:835:GLY:H	1.73	0.52
1:C:811:ARG:NH1	1:C:890:GLU:O	2.41	0.52
2:D:391:SER:OG	2:D:392:VAL:N	2.42	0.52
1:A:822:ASP:OD1	1:A:822:ASP:N	2.41	0.52
1:A:858:LYS:O	1:A:859:ARG:NH1	2.43	0.51
1:C:259:ASN:HD22	1:C:404:GLN:HG3	1.76	0.51
3:X:20:G:H2'	3:X:21:U:C6	2.45	0.51
1:A:485:LEU:CD1	1:A:541:TYR:CE1	2.93	0.51
2:D:284:SER:OG	2:D:285:HIS:N	2.43	0.51
2:B:329:VAL:HB	2:B:410:LEU:HB3	1.92	0.51
3:X:8:C:H2'	3:X:9:G:C8	2.46	0.51
2:B:358:SER:OG	2:B:359:ALA:N	2.43	0.50
1:C:824:ARG:HD2	1:C:918:PHE:HA	1.92	0.50
1:C:811:ARG:NH1	1:C:892:PHE:O	2.44	0.50
1:C:826:ILE:HD12	1:C:830:HIS:HB2	1.93	0.50
1:A:354:ASN:HA	1:A:357:LYS:HB2	1.93	0.50
1:A:368:LEU:HD23	1:A:404:GLN:HB2	1.94	0.50
1:C:861:LYS:HG2	1:C:875:ILE:HG22	1.93	0.50
1:A:772:ASP:HB3	1:A:775:VAL:HG22	1.92	0.50
1:C:855:SER:O	1:C:855:SER:OG	2.29	0.50
3:X:20:G:O2'	3:X:21:U:H5'	2.12	0.50
2:B:304:CYS:SG	2:B:412:PRO:CD	2.91	0.49
1:A:390:TYR:OH	1:A:435:ASP:OD2	2.30	0.49
1:C:293:VAL:HG13	1:C:368:LEU:HD23	1.93	0.49
1:C:824:ARG:HB3	1:C:918:PHE:HB2	1.94	0.49
1:A:866:ARG:HB2	1:A:869:CYS:HB2	1.93	0.49
1:A:379:LYS:NZ	3:X:6:U:OP1	2.43	0.49
1:A:557:HIS:O	1:A:715:TYR:OH	2.31	0.49
1:A:610:LYS:HD2	1:A:715:TYR:HE1	1.78	0.49
1:C:379:LYS:O	1:C:380:GLN:NE2	2.46	0.49
1:A:465:SER:OG	1:A:466:ARG:N	2.44	0.49
2:B:385:GLY:HA3	2:B:403:THR:HG23	1.95	0.49
1:C:714:LEU:HD23	1:C:717:TYR:HB3	1.94	0.49
1:A:757:LYS:HA	1:A:760:MET:HG3	1.94	0.48

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:501:ASN:OD1	1:A:501:ASN:N	2.45	0.48
2:B:282:THR:HG23	2:B:424:TYR:HB3	1.95	0.48
1:C:561:LYS:NZ	1:C:565:ASP:OD2	2.45	0.48
2:D:354:THR:O	2:D:356:GLN:NE2	2.40	0.48
3:X:7:A:H2'	3:X:8:C:H6	1.79	0.48
2:B:381:ASN:HD22	2:B:386:LYS:HB2	1.78	0.48
1:C:631:ILE:O	1:C:631:ILE:CG2	2.53	0.48
1:C:350:ILE:O	1:C:354:ASN:ND2	2.47	0.48
1:C:847:HIS:HB2	1:C:860:ALA:HA	1.94	0.48
2:B:337:ASP:OD1	2:B:337:ASP:N	2.43	0.48
1:C:844:SER:OG	1:C:845:ARG:N	2.47	0.48
1:A:788:LYS:NZ	1:A:792:ASP:OD2	2.41	0.48
1:C:296:PHE:HZ	1:C:351:LEU:HD23	1.79	0.48
1:C:657:LYS:H	1:C:692:ASN:HB2	1.79	0.48
1:A:260:THR:HG23	1:A:438:VAL:HG23	1.96	0.47
1:A:826:ILE:HG22	1:A:827:GLU:HG3	1.95	0.47
2:B:310:SER:OG	2:B:311:GLY:N	2.46	0.47
2:B:258:ALA:HB2	2:B:313:HIS:HA	1.95	0.47
4:Y:6:A:C6	4:Y:7:G:O6	2.68	0.47
1:A:483:GLU:OE2	1:A:502:ARG:NH1	2.48	0.47
1:C:698:SER:OG	1:C:717:TYR:OH	2.23	0.47
1:A:469:ASP:OD1	1:A:469:ASP:N	2.43	0.47
2:B:279:ARG:HB2	2:B:427:ILE:HB	1.97	0.47
1:A:540:LEU:O	1:A:544:HIS:ND1	2.35	0.47
1:A:575:ARG:HG3	1:A:579:PHE:HZ	1.79	0.47
1:A:514:VAL:HG21	4:Y:17:G:H4'	1.97	0.46
2:B:304:CYS:SG	2:B:411:TYR:HB3	2.55	0.46
1:A:334:VAL:HG23	1:A:359:THR:HG21	1.96	0.46
1:C:442:VAL:HG21	1:C:449:LEU:HD22	1.98	0.46
1:A:391:LEU:HD23	1:A:391:LEU:HA	1.83	0.46
1:A:517:GLN:HG2	1:A:542:THR:HG21	1.98	0.46
1:A:525:MET:HG2	1:A:527:ASP:H	1.81	0.46
1:A:571:PHE:HA	1:A:574:VAL:HG12	1.98	0.46
1:A:848:PRO:O	1:A:849:LYS:HG3	2.16	0.46
1:C:540:LEU:HD23	1:C:540:LEU:HA	1.84	0.46
1:A:524:GLN:NE2	1:A:900:GLY:O	2.48	0.46
4:Y:6:A:N1	4:Y:7:G:C6	2.84	0.46
1:A:488:ARG:HG3	1:A:489:ILE:HG13	1.97	0.45
3:X:4:C:H2'	3:X:5:G:C8	2.48	0.45
2:D:290:TYR:HB2	2:D:296:ARG:HH11	1.81	0.45
2:B:274:VAL:HB	2:B:281:VAL:HG23	1.98	0.45

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:510:GLU:HA	1:C:513:ILE:HG22	1.99	0.45
1:C:889:ILE:HB	1:C:908:TRP:CE2	2.51	0.45
2:D:258:ALA:HB3	2:D:314:TYR:H	1.81	0.45
2:D:264:ASN:HD21	2:D:266:LYS:HB2	1.81	0.45
1:A:802:ASP:HB2	1:A:913:PHE:HA	1.99	0.44
1:C:284:LYS:O	1:C:284:LYS:HG2	2.17	0.44
1:A:264:ALA:HB3	1:A:270:LYS:HG3	2.00	0.44
1:A:416:ASP:N	1:A:416:ASP:OD1	2.51	0.44
1:C:547:LYS:HA	1:C:547:LYS:HD3	1.72	0.44
1:A:493:LEU:HD12	1:A:494:GLU:HG2	1.98	0.44
2:B:273:GLU:OE1	2:B:284:SER:OG	2.34	0.44
4:Y:6:A:C6	4:Y:7:G:C6	3.06	0.44
1:A:580:ASP:O	1:A:584:GLN:N	2.42	0.44
1:C:571:PHE:HA	1:C:574:VAL:HG12	1.98	0.44
1:A:839:LYS:HE3	1:A:885:PRO:HD3	1.98	0.44
2:B:390:TYR:HE1	2:B:398:LEU:HD23	1.82	0.44
3:X:2:G:H2'	3:X:3:A:C8	2.51	0.43
1:A:644:LYS:HA	1:A:644:LYS:HD2	1.89	0.43
1:C:374:CYS:HB2	1:C:434:LEU:HD21	2.00	0.43
2:B:324:HIS:CE1	2:B:353:GLY:HA2	2.53	0.43
3:X:8:C:H2'	3:X:9:G:H8	1.83	0.43
1:C:652:LYS:HG2	2:D:337:ASP:HB2	2.01	0.43
1:C:331:ASN:N	1:C:331:ASN:OD1	2.51	0.43
1:C:460:PHE:HB3	1:C:748:ILE:HD12	2.00	0.43
1:A:356:LYS:HE3	1:A:356:LYS:HB3	1.88	0.43
1:A:713:ILE:HA	1:A:739:PHE:O	2.18	0.43
1:A:282:LEU:HD23	1:A:285:PHE:HE2	1.83	0.43
1:C:852:GLN:HA	1:C:857:GLU:HA	2.01	0.43
2:D:264:ASN:HD22	2:D:267:SER:HB3	1.84	0.43
1:A:461:ARG:N	1:A:740:LEU:O	2.50	0.43
3:X:15:C:H6	3:X:15:C:O5'	2.01	0.43
3:X:7:A:O2'	3:X:8:C:H5'	2.19	0.42
2:B:303:LEU:HD12	2:B:411:TYR:HB2	2.01	0.42
2:B:350:GLU:O	2:B:358:SER:N	2.53	0.42
1:A:360:ILE:HA	1:A:365:ILE:HD12	2.01	0.42
1:C:811:ARG:HH11	1:C:892:PHE:H	1.68	0.42
1:A:316:ARG:HG3	1:A:317:HIS:CD2	2.54	0.42
1:A:707:ALA:HB2	1:A:726:GLN:HB2	2.01	0.42
2:B:300:SER:OG	2:B:300:SER:O	2.37	0.42
1:C:830:HIS:HD2	4:Y:2:C:H1'	1.83	0.42
1:C:390:TYR:HE1	1:C:402:LEU:HB3	1.85	0.41

*Continued on next page...*

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:824:ARG:HA	1:C:824:ARG:HD3	1.85	0.41
1:A:656:LEU:HD13	1:A:693:ILE:HD12	2.02	0.41
1:C:597:LEU:HD23	1:C:597:LEU:HA	1.86	0.41
1:C:830:HIS:NE2	4:Y:2:C:O2	2.53	0.41
2:D:332:TRP:HB2	2:D:411:TYR:HE2	1.85	0.41
1:C:274:SER:HB3	1:C:408:LEU:HD11	2.03	0.41
3:X:6:U:H2'	3:X:7:A:H8	1.85	0.41
1:A:640:VAL:HG13	1:A:695:ILE:HB	2.02	0.41
1:A:481:ASP:O	1:A:485:LEU:HD23	2.20	0.41
1:C:493:LEU:HD23	1:C:493:LEU:HA	1.89	0.41
1:C:858:LYS:HA	1:C:877:VAL:HG23	2.01	0.41
1:A:728:ARG:HA	1:A:728:ARG:HD3	1.92	0.41
2:B:315:TRP:O	2:B:378:ILE:N	2.51	0.41
1:C:653:LEU:HD23	1:C:653:LEU:HA	1.85	0.41
1:C:832:THR:HG21	1:C:884:ILE:HD12	2.03	0.41
1:C:847:HIS:CD2	1:C:848:PRO:HD2	2.56	0.41
2:B:269:SER:O	2:B:296:ARG:NH2	2.54	0.41
2:D:258:ALA:HB2	2:D:313:HIS:HA	2.02	0.41
4:Y:6:A:C2	4:Y:7:G:C6	3.09	0.41
1:A:511:GLN:HE22	3:X:10:U:H1'	1.86	0.41
2:B:279:ARG:HA	2:B:427:ILE:HD12	2.03	0.41
1:C:356:LYS:HB2	1:C:356:LYS:HE3	1.81	0.41
1:C:379:LYS:NZ	4:Y:8:U:OP1	2.41	0.41
1:C:545:LEU:HD23	1:C:545:LEU:HA	1.89	0.41
1:C:798:LYS:HD2	1:C:799:PRO:HD2	2.03	0.41
3:X:2:G:H8	3:X:2:G:P	2.44	0.41
2:B:297:PHE:HD1	2:B:336:ARG:HH11	1.69	0.41
1:A:824:ARG:HA	1:A:824:ARG:HD3	1.88	0.40
1:A:895:GLU:HA	1:A:902:GLN:HA	2.02	0.40
2:B:317:VAL:HG12	2:B:427:ILE:HG23	2.03	0.40
2:D:297:PHE:HZ	2:D:303:LEU:HD23	1.85	0.40
2:D:319:THR:HA	2:D:425:LEU:HD22	2.02	0.40
1:A:250:LEU:HD22	1:A:262:ILE:HD11	2.03	0.40
1:A:807:LYS:HG3	1:A:895:GLU:HB3	2.03	0.40
2:B:376:VAL:HA	2:B:391:SER:HA	2.03	0.40
1:C:300:ILE:HD13	1:C:300:ILE:HA	1.89	0.40
1:C:392:ASP:OD1	1:C:788:LYS:NZ	2.40	0.40
1:C:913:PHE:CE1	1:C:915:LYS:HG2	2.57	0.40
1:A:711:LEU:HG	1:A:713:ILE:HD11	2.04	0.40
2:D:284:SER:HG	2:D:286:ARG:H	1.69	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	
1	A	639/925 (69%)	596 (93%)	43 (7%)	0	100	100
1	C	623/925 (67%)	579 (93%)	44 (7%)	0	100	100
2	B	174/432 (40%)	162 (93%)	12 (7%)	0	100	100
2	D	174/432 (40%)	157 (90%)	17 (10%)	0	100	100
All	All	1610/2714 (59%)	1494 (93%)	116 (7%)	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.

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	584/834 (70%)	582 (100%)	2 (0%)	91	92
1	C	573/834 (69%)	573 (100%)	0	100	100
2	B	158/369 (43%)	158 (100%)	0	100	100
2	D	156/369 (42%)	156 (100%)	0	100	100
All	All	1471/2406 (61%)	1469 (100%)	2 (0%)	92	94

All (2) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	502	ARG
1	A	655	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (18) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	287	GLN
1	A	305	GLN
1	A	606	ASN
1	A	692	ASN
1	A	871	HIS
2	B	256	GLN
2	B	321	ASN
2	B	324	HIS
2	B	381	ASN
1	C	259	ASN
1	C	380	GLN
1	C	393	GLN
1	C	500	GLN
1	C	501	ASN
1	C	769	GLN
2	D	256	GLN
2	D	264	ASN
2	D	423	ASN

### 5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
3	X	22/24 (91%)	1 (4%)	0
4	Y	22/24 (91%)	6 (27%)	0
All	All	44/48 (91%)	7 (15%)	0

All (7) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
3	X	8	C
4	Y	5	C
4	Y	12	G
4	Y	16	C
4	Y	20	C
4	Y	21	G
4	Y	23	C

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.

## 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.

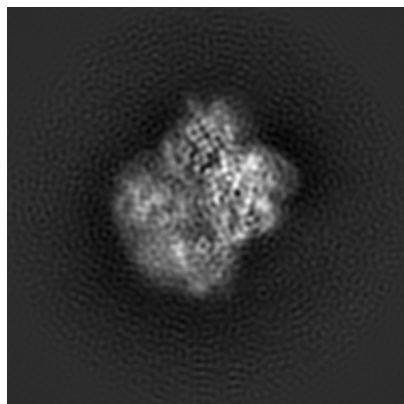
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-29824. These allow visual inspection of the internal detail of the map and identification of artifacts.

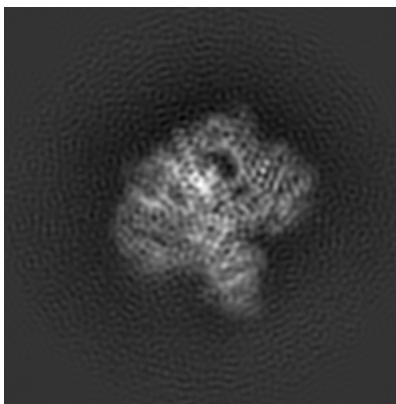
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

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

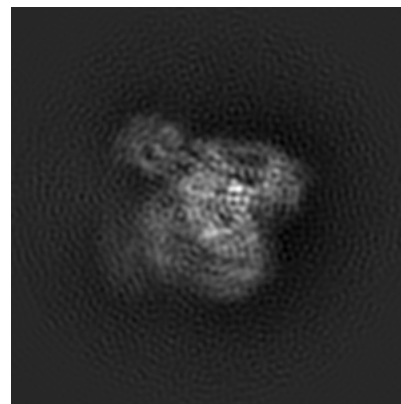
#### 6.1.1 Primary map



X

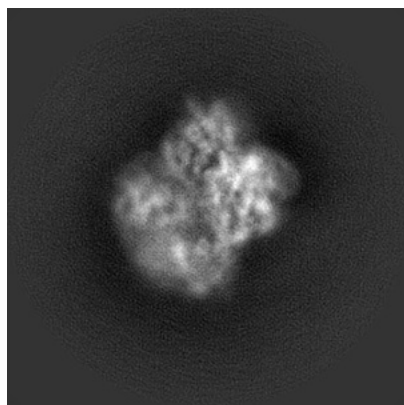


Y

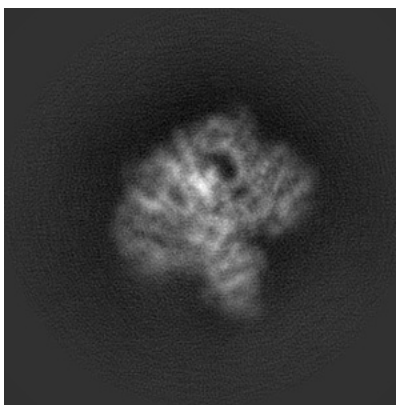


Z

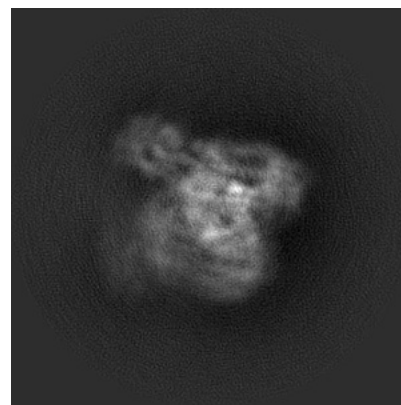
#### 6.1.2 Raw map



X



Y

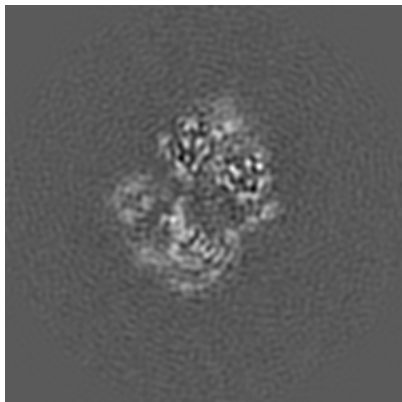


Z

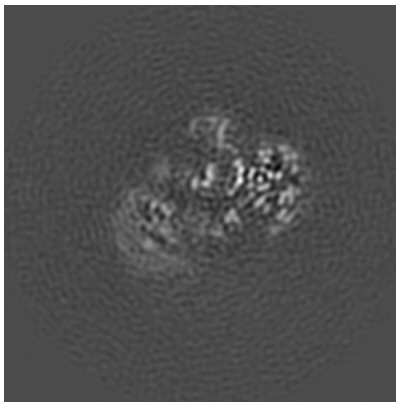
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices [i](#)

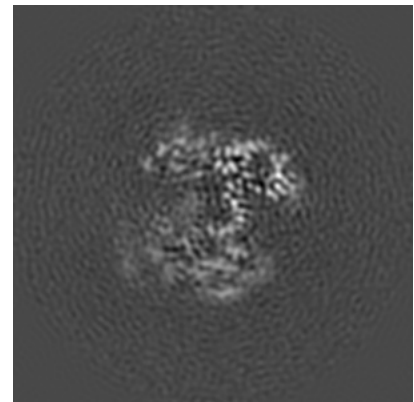
### 6.2.1 Primary map



X Index: 132

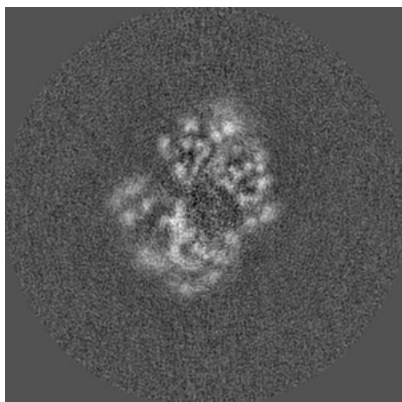


Y Index: 132

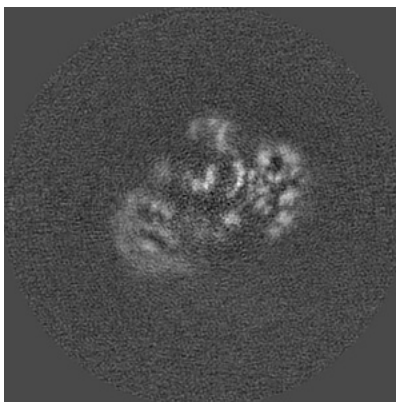


Z Index: 132

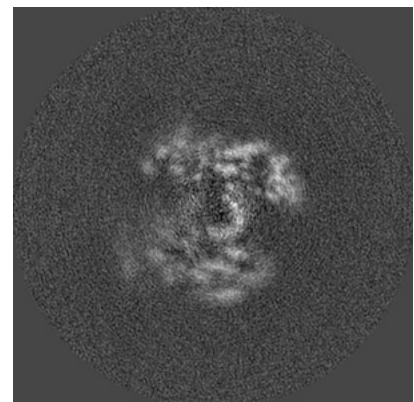
### 6.2.2 Raw map



X Index: 132



Y Index: 132

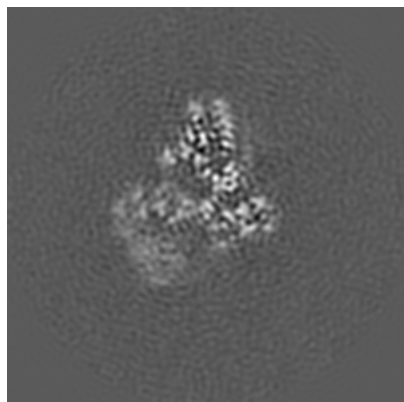


Z Index: 132

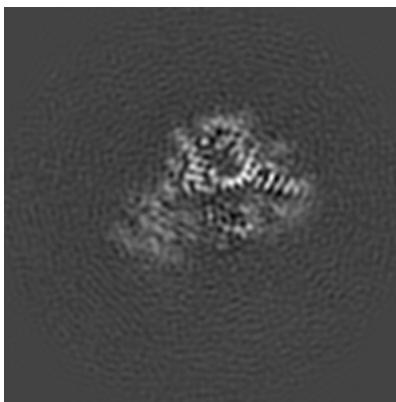
The images above show central slices of the map in three orthogonal directions.

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

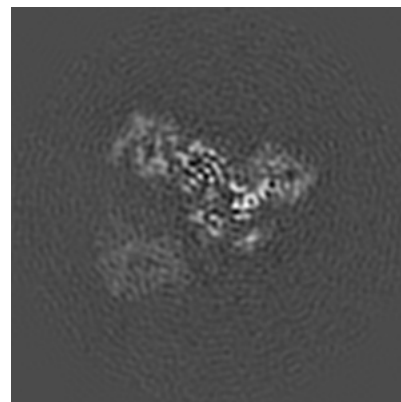
### 6.3.1 Primary map



X Index: 146

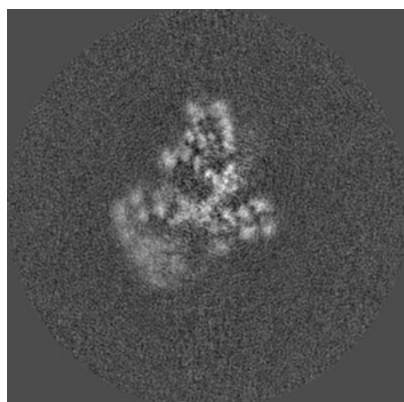


Y Index: 143

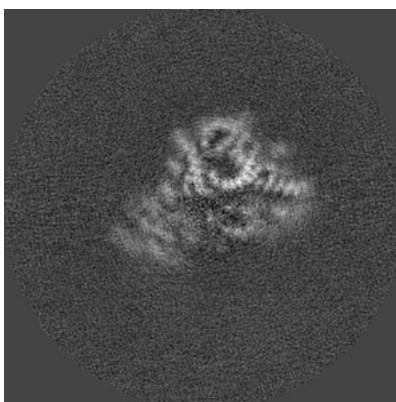


Z Index: 156

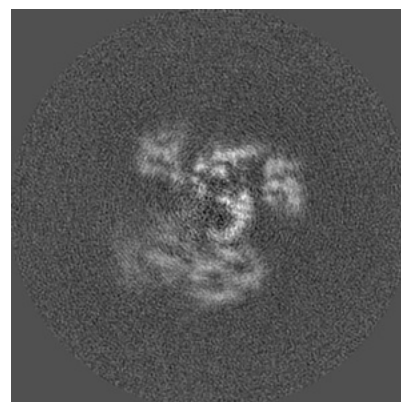
### 6.3.2 Raw map



X Index: 147



Y Index: 143

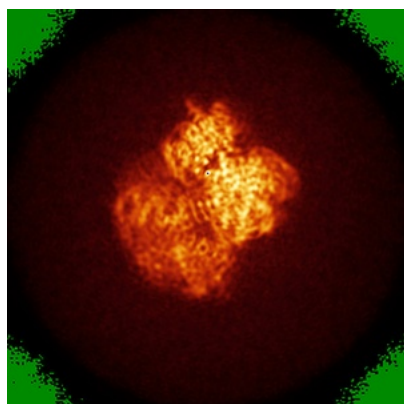


Z Index: 135

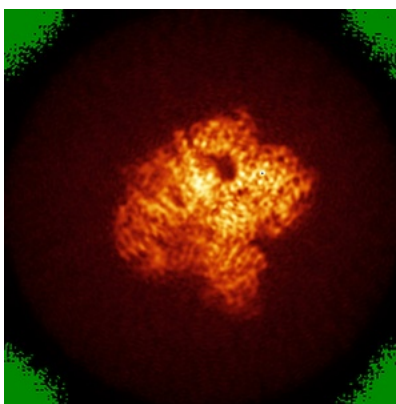
The images above show the largest variance slices of the map in three orthogonal directions.

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

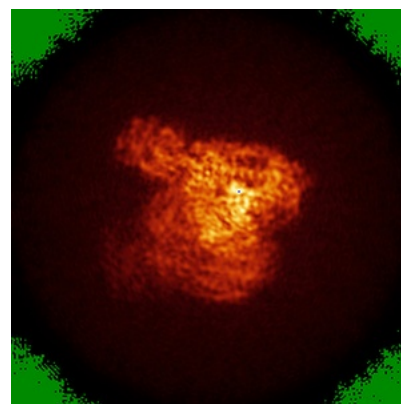
### 6.4.1 Primary map



X

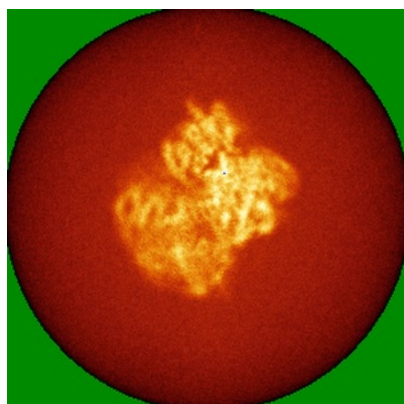


Y

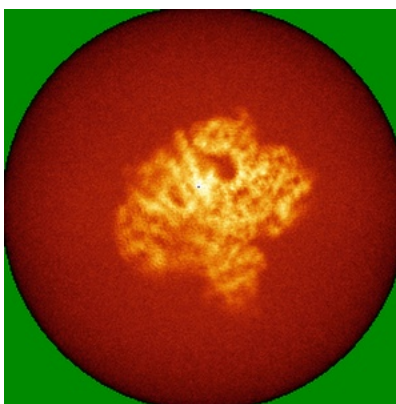


Z

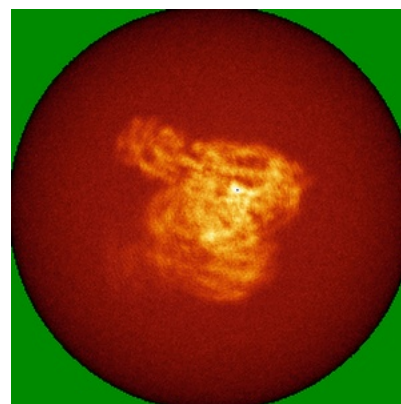
### 6.4.2 Raw map



X



Y

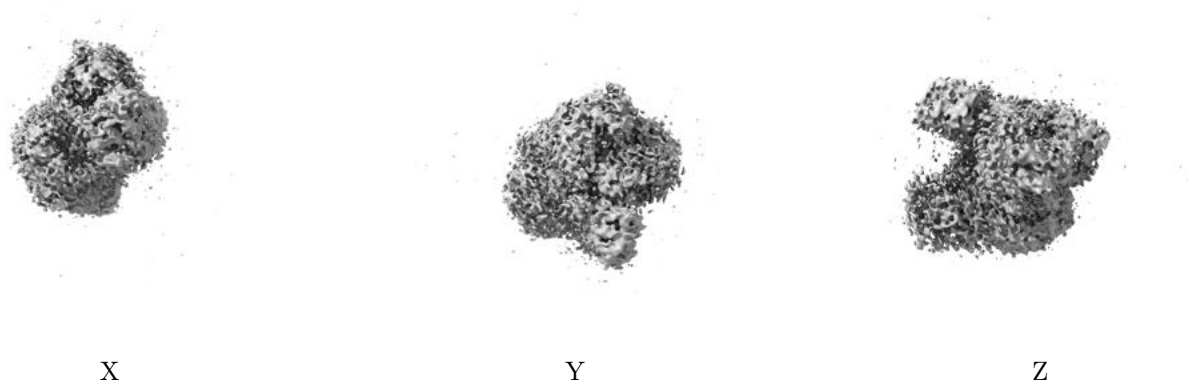


Z

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.

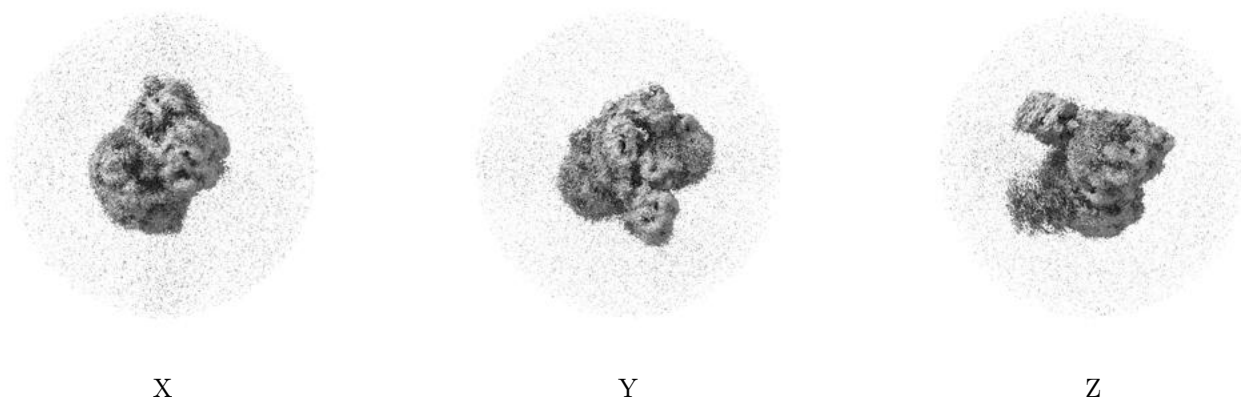
## 6.5 Orthogonal surface views [i](#)

### 6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.005. 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.

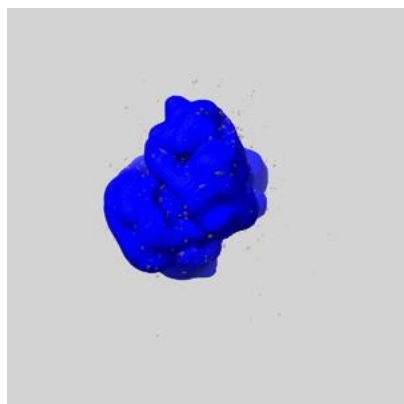
## 6.6 Mask visualisation [i](#)

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

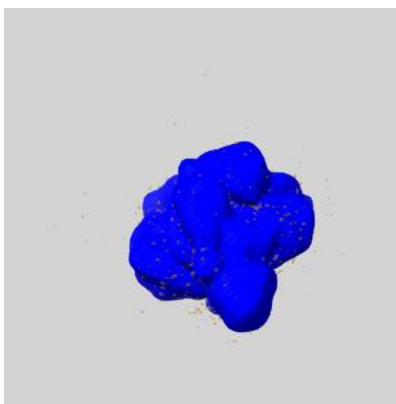
A mask typically either:

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

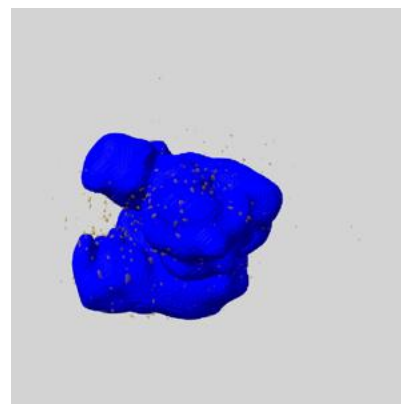
### 6.6.1 emd\_29824\_msk\_1.map [i](#)



X



Y

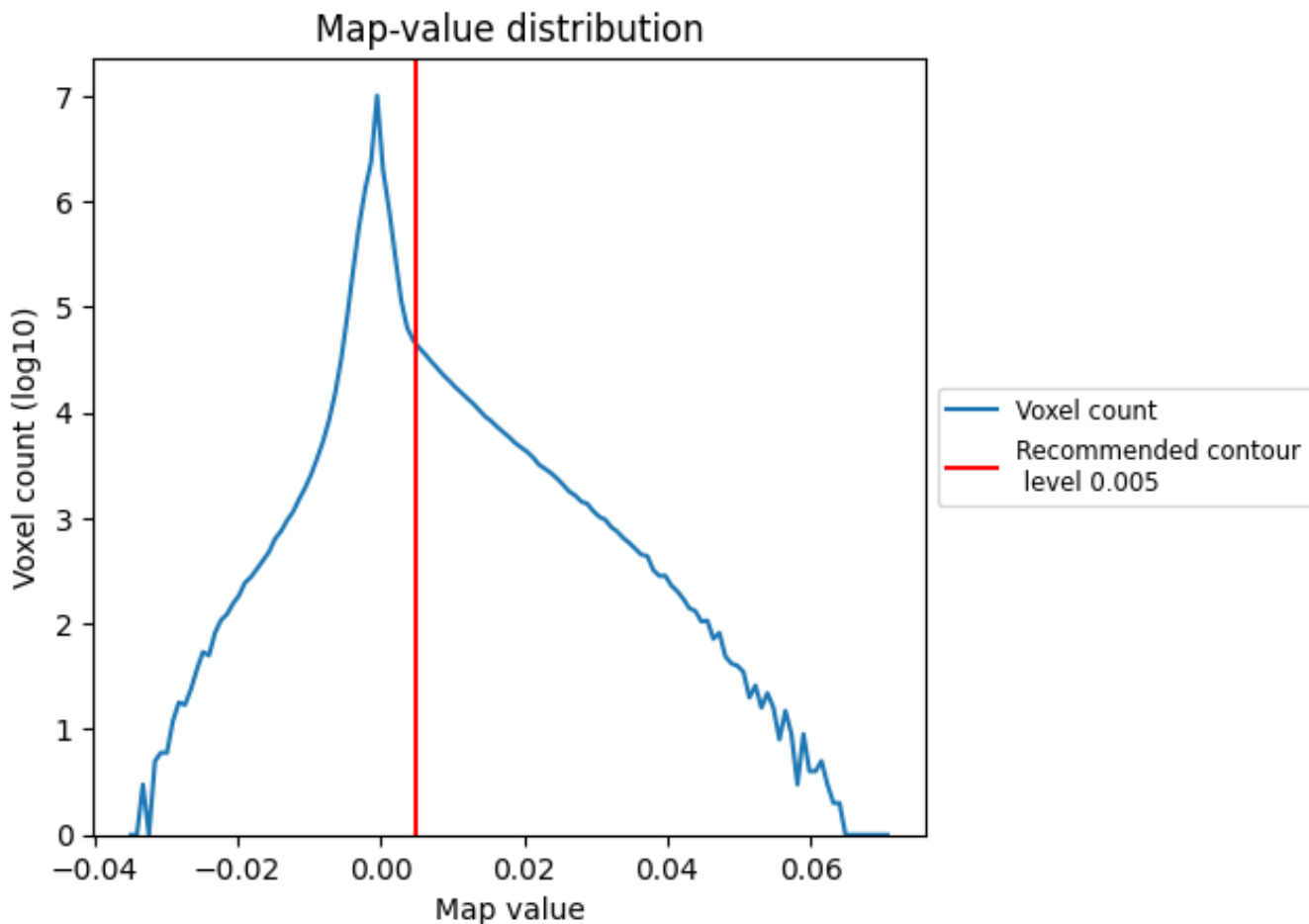


Z

## 7 Map analysis [i](#)

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

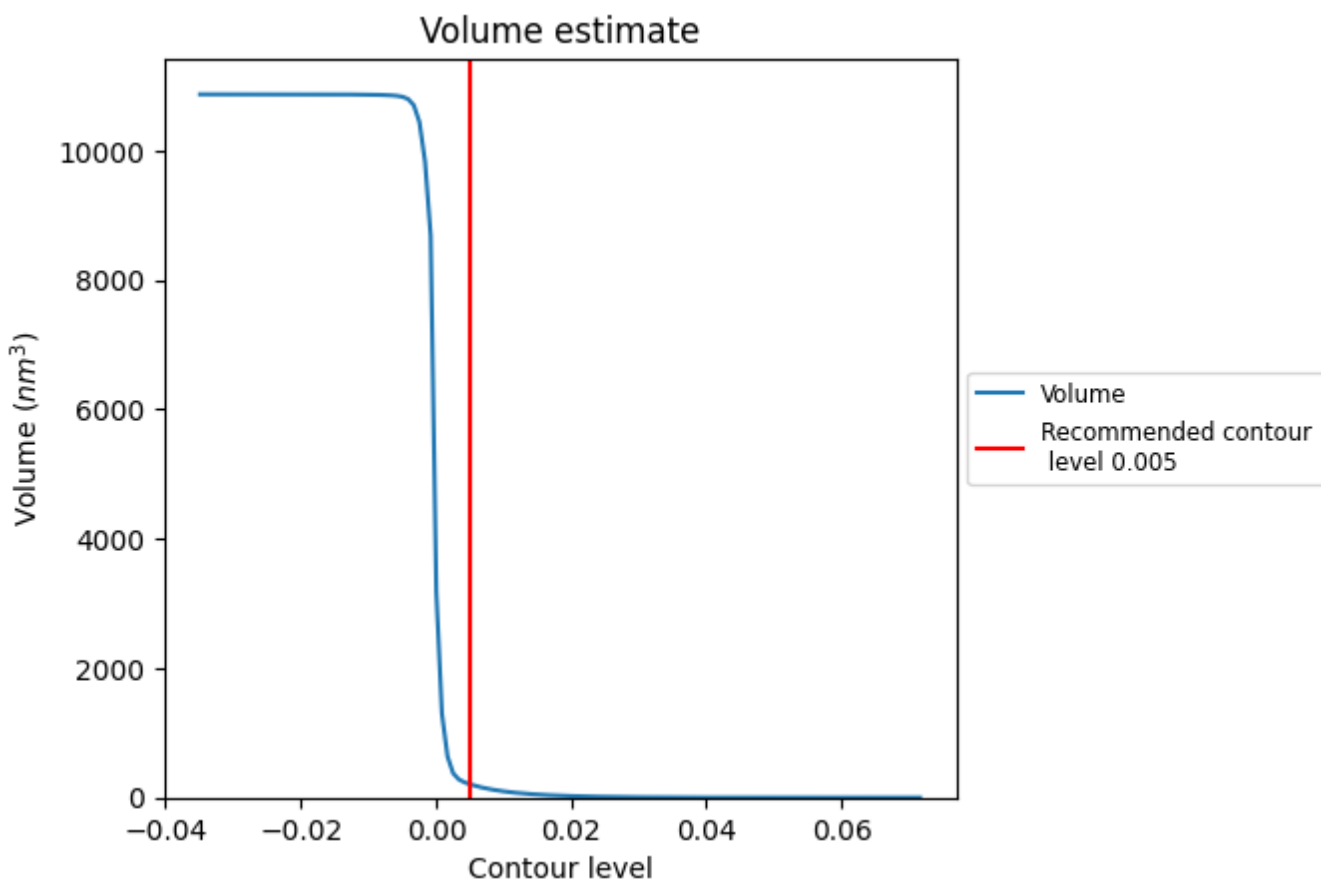
### 7.1 Map-value distribution [i](#)



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.



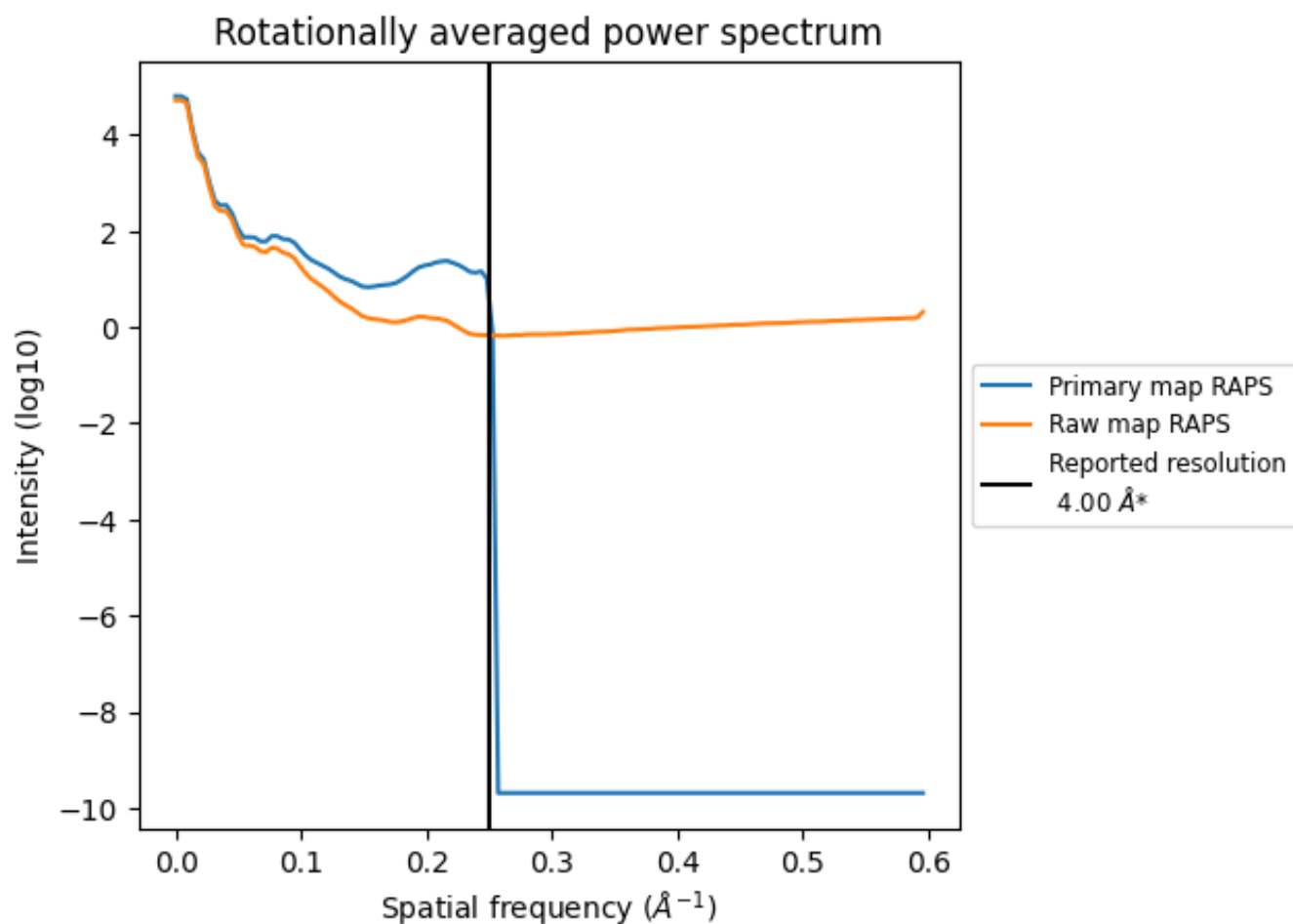
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 207  $\text{nm}^3$ ; this corresponds to an approximate mass of 187 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](#)

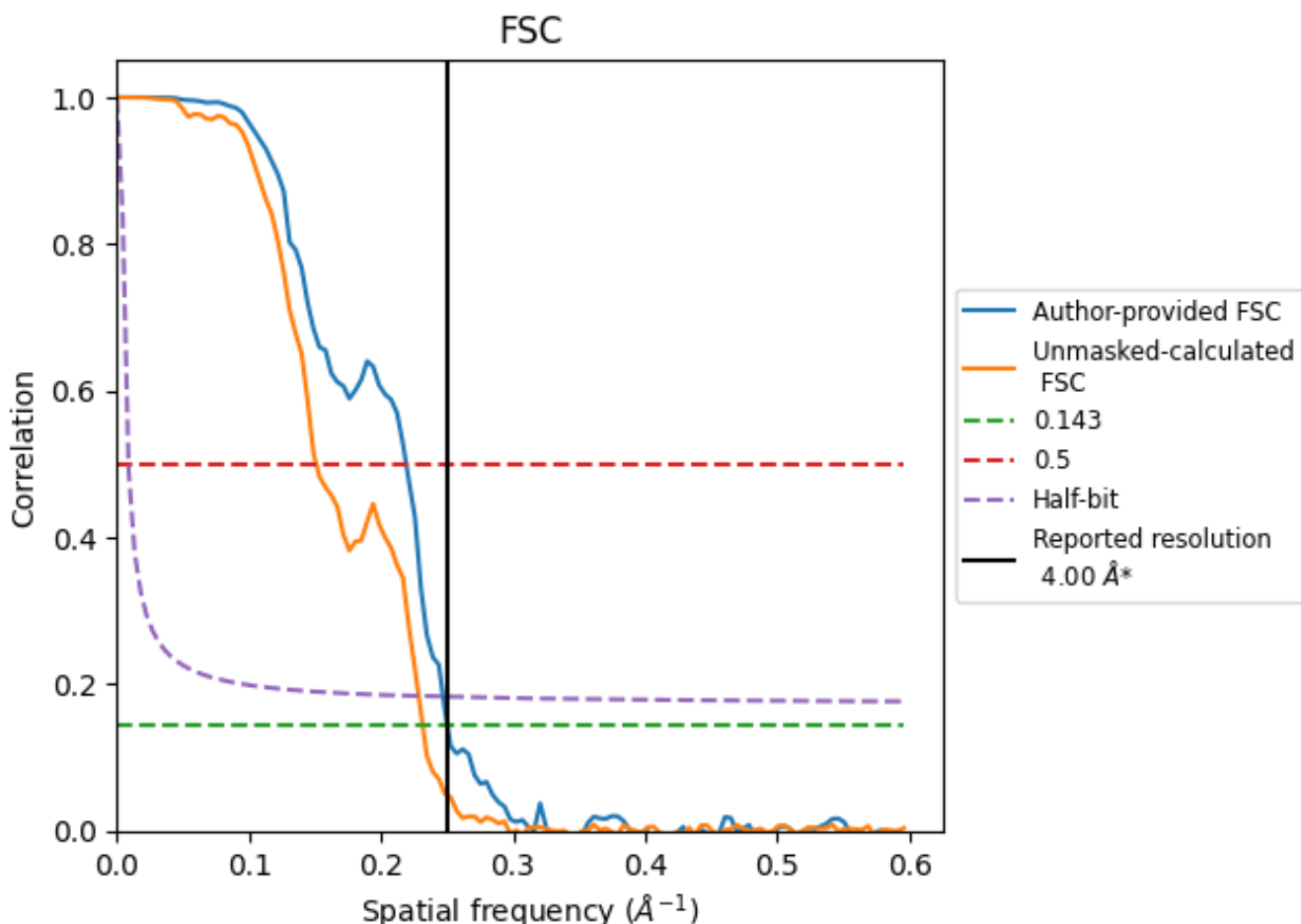


\*Reported resolution corresponds to spatial frequency of 0.250 Å<sup>-1</sup>

## 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  $0.250 \text{\AA}^{-1}$

## 8.2 Resolution estimates [i](#)

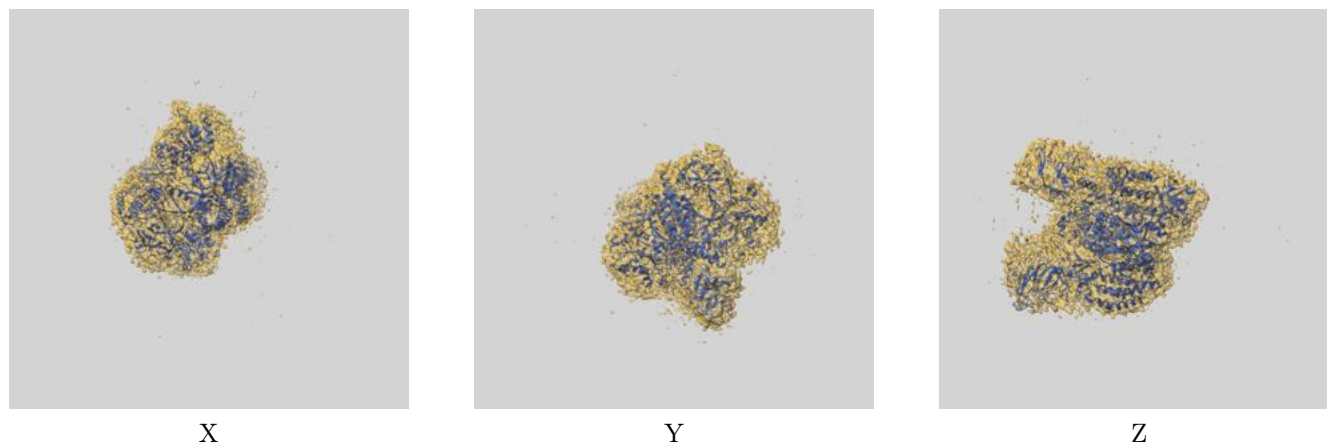
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	4.00	-	-
Author-provided FSC curve	4.00	4.56	4.05
Unmasked-calculated*	4.32	6.62	4.38

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

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

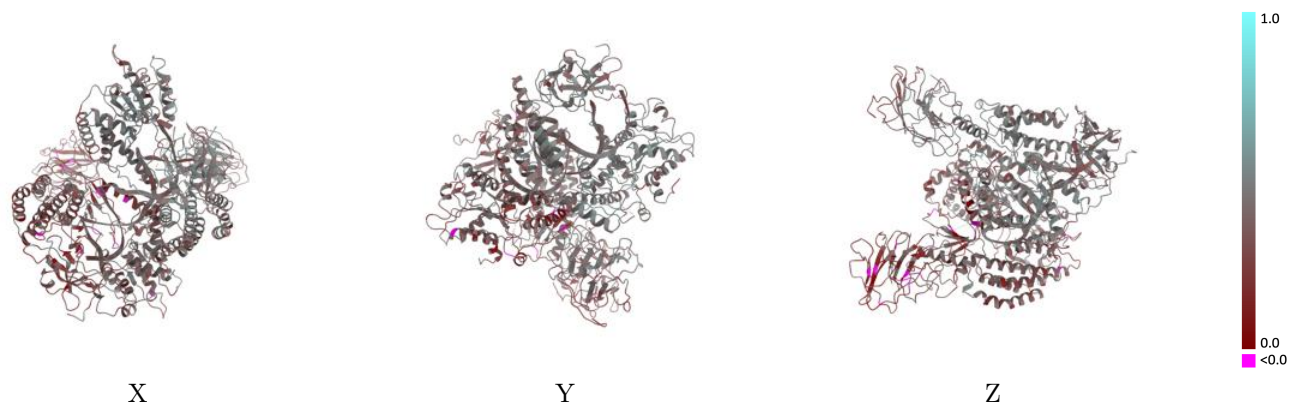
This section contains information regarding the fit between EMDB map EMD-29824 and PDB model 8G7U. Per-residue inclusion information can be found in section 3 on page 4.

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



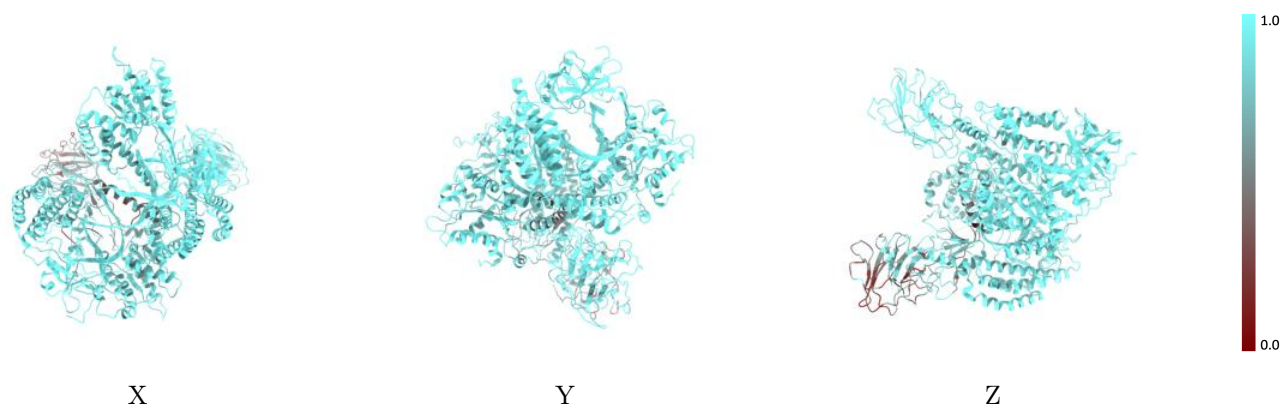
The images above show the 3D surface view of the map at the recommended contour level 0.005 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



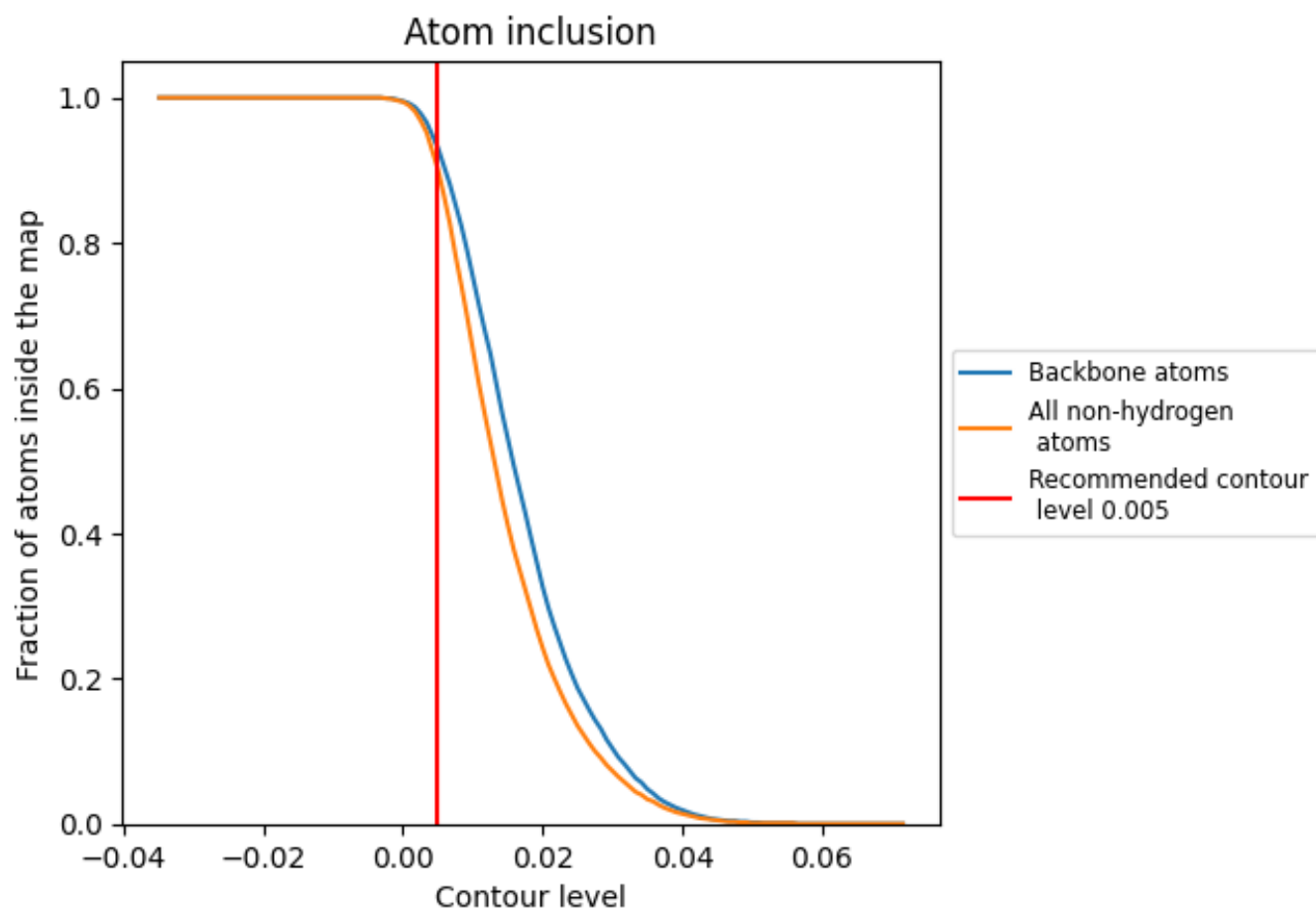
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.005).















## 9.4 Atom inclusion [i](#)



At the recommended contour level, 93% of all backbone atoms, 90% 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 (0.005) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.9020	 0.3790
A	 0.8980	 0.3260
B	 0.5590	 0.2570
C	 0.9730	 0.4540
D	 0.9450	 0.4090
X	 0.9830	 0.4000
Y	 0.9770	 0.4160

