



## Full wwPDB EM Validation Report ⓘ

Jul 22, 2023 – 08:08 pm BST

PDB ID : 8CFA  
EMDB ID : EMD-16624  
Title : HK97 Prohead II as part of a DNA packaging complex  
Authors : Hawkins, D.E.D.P.; Antson, A.A.  
Deposited on : 2023-02-03  
Resolution : 3.06 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>.

---

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

EMDB validation analysis : 0.0.1.dev50  
MolProbity : 4.02b-467  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
MapQ : 1.9.9  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.34

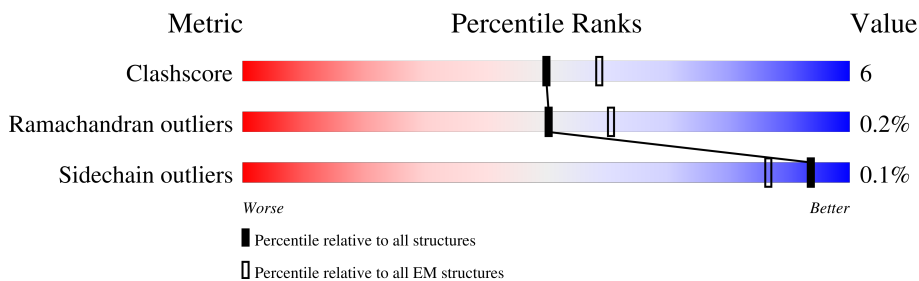
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 3.06 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	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 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	385	
1	B	385	
1	C	385	
1	D	385	
1	E	385	
1	F	385	
1	G	385	

## 2 Entry composition [i](#)

There is only 1 type of molecule in this entry. The entry contains 25751 atoms, of which 12730 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.

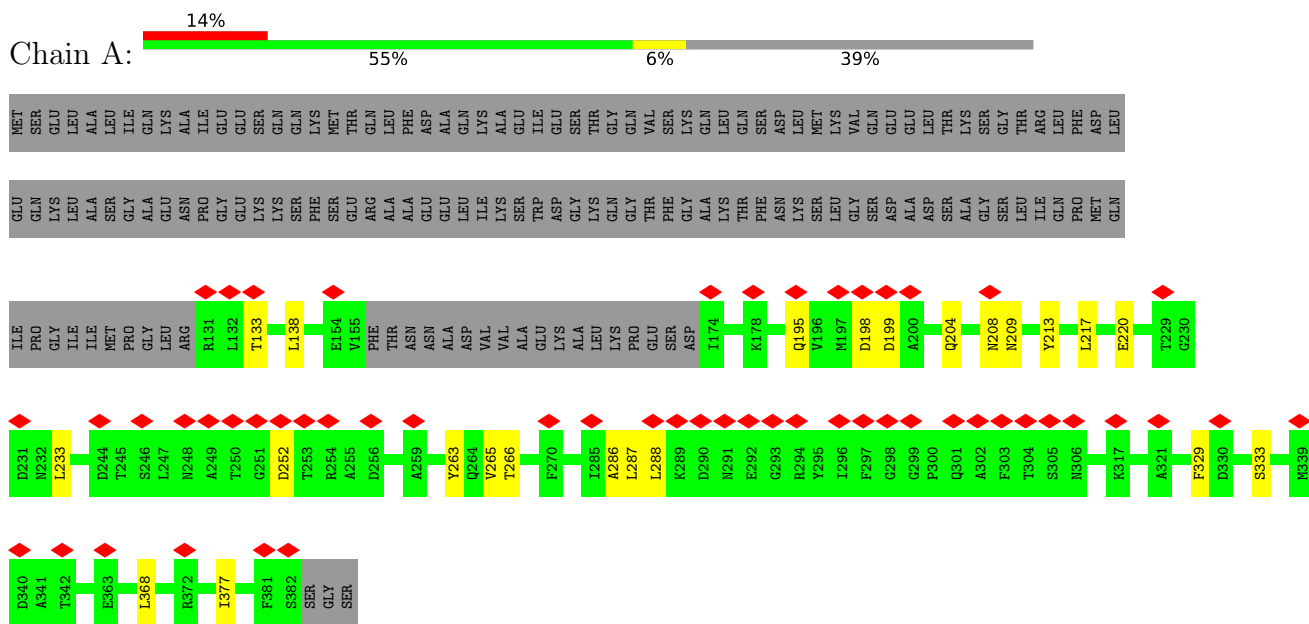
- Molecule 1 is a protein called Major capsid subunit.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
1	A	234	Total	C	H	N	O	S	0	0
			3601	1140	1780	320	353	8		
1	B	241	Total	C	H	N	O	S	0	0
			3712	1176	1835	330	363	8		
1	C	240	Total	C	H	N	O	S	0	0
			3697	1171	1827	329	362	8		
1	D	238	Total	C	H	N	O	S	0	0
			3671	1163	1813	327	360	8		
1	E	239	Total	C	H	N	O	S	0	0
			3685	1167	1823	328	359	8		
1	F	237	Total	C	H	N	O	S	0	0
			3657	1157	1809	326	357	8		
1	G	242	Total	C	H	N	O	S	0	0
			3728	1181	1843	331	364	9		

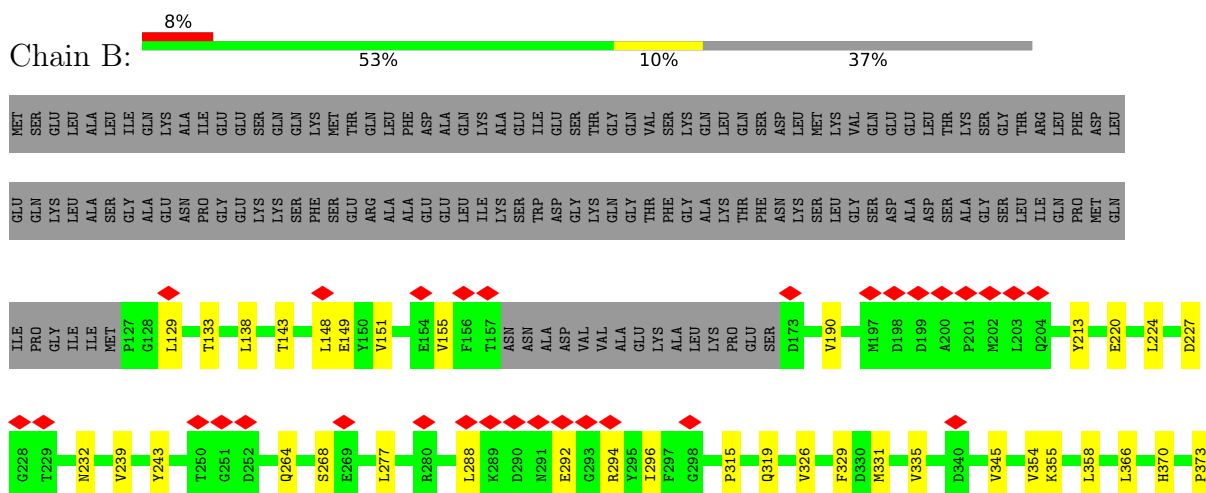
### 3 Residue-property plots [i](#)

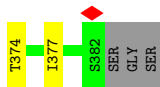
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion 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: Major capsid subunit



- Molecule 1: Major capsid subunit





- Molecule 1: Major capsid subunit



MET  
SER  
GLU  
LEU  
ALA  
LEU  
ILE  
LEU  
ILE  
GLN  
LYS

GLU  
GLN  
LYS  
LEU  
ALA  
SER  
GLY  
ALA  
ALA  
LEU  
THR  
LYS

ILE  
PRO  
GLY  
ILE  
MET  
PRO  
G128  
L129  
R130  
R131  
L132  
L133  
L134  
I135  
R136  
D137  
L138  
A139  
Q140  
S154  
V155  
F156  
T157

A216  
K218  
E219  
E220  
G221  
Q222  
D227  
G228  
T229  
M232  
M237  
A240  
D244  
T245  
S246  
L247  
M248  
A249  
T250  
G251  
D252  
T253  
R254  
A261  
I262  
Y263  
Q264  
V265  
T266  
E269  
A272  
I275  
V276  
L277  
R280  
L288  
K289  
D290  
M291  
E292  
G293  
R294  
Y295  
F297  
V314

P315  
T316  
V326  
Q334  
D337  
D340  
A341  
C362  
E363  
L368  
I377  
K378  
SER  
GLY  
SER

- Molecule 1: Major capsid subunit



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

GLU  
GLN  
LYS  
LEU  
ALA  
SER  
GLY  
ALA  
ALA  
LEU  
SER  
GLN  
LYS  
PHE  
GLU  
ARG  
ALA  
ALA  
GLU  
LEU  
LEU  
ILE  
LYS  
SER  
TRP  
ASP  
GLY  
LYS  
THR  
PHE  
ASN  
LYS  
SER  
LEU  
SER  
GLY  
VAL  
GLN  
ASP  
ALA  
ASP  
SER  
SER  
GLY  
GLY  
LEU  
SER  
SER  
THR

ILE  
PRO  
GLY  
ILE  
MET  
PRO  
GLY  
LEU  
R130  
L138  
F156  
T157  
ASN  
ALA  
ASP  
GLU  
LYS  
ALA  
LEU  
LYS  
SER  
PRO  
GLU  
SER  
D173  
I174  
T175  
F176  
Q191  
R194  
Q195  
D196  
D199  
L233  
E234  
Y243  
S246  
L247  
M248  
A249  
T250  
G251  
D252  
T253  
R254  
A255  
D256

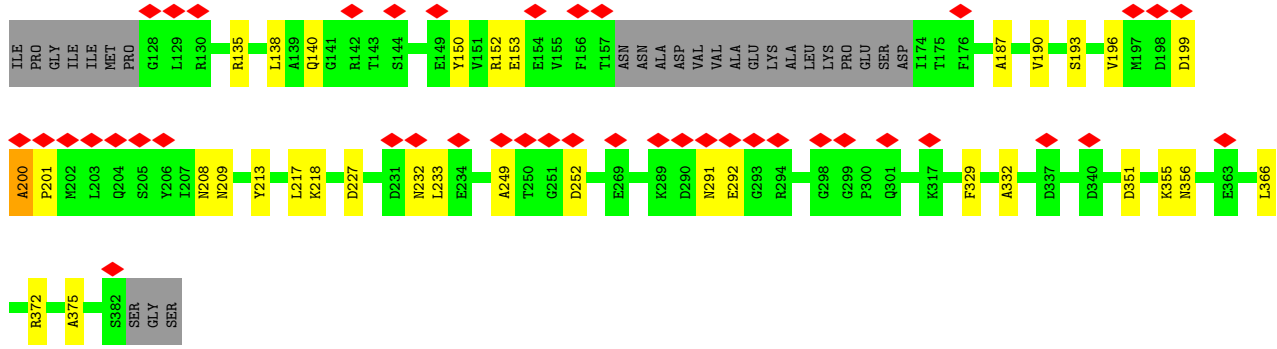
H260  
D281  
W282  
D290  
M291  
E292  
G293  
R294  
Y295  
G298  
G299  
P300  
Q301  
F303  
T304  
T316  
K317  
A318  
F329  
D330  
Q334  
V335  
S346  
R347  
N356  
M357  
L358  
L366  
A367  
L368  
S382  
SER  
GLY  
SER

- Molecule 1: Major capsid subunit

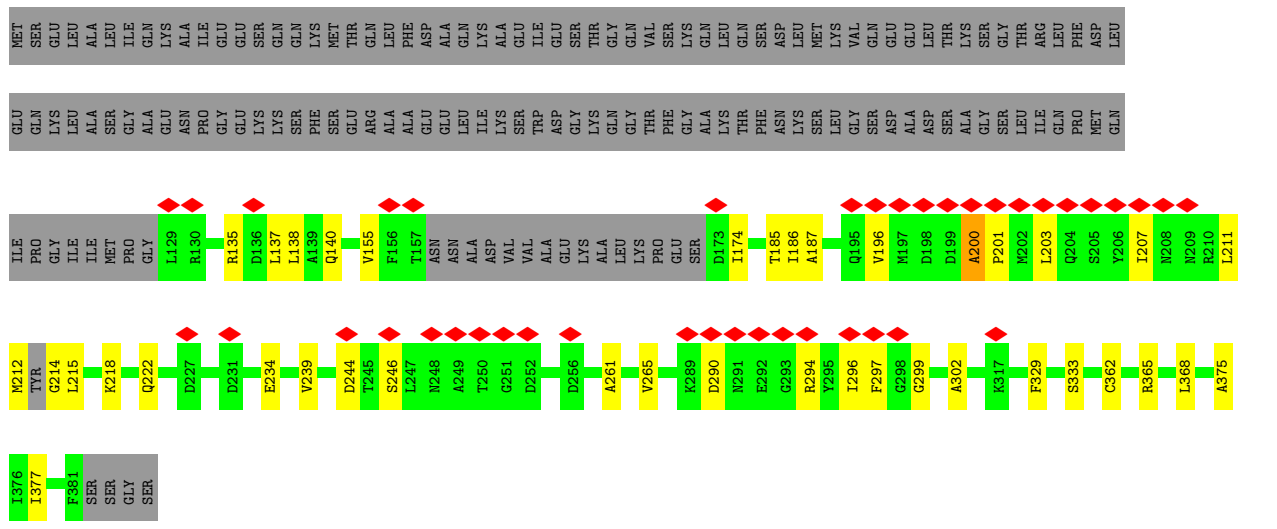


MET  
SER  
GLU  
LEU  
ALA  
LEU  
ILE  
GLN  
LYS  
ASN  
PRO  
ASN  
GLY  
GLU  
SER  
GLN  
LYS  
SER  
PHE  
SER  
THR  
GLN  
ALA  
ALA  
PHE  
ASP  
GLU  
GLN  
LYS  
ALA  
LEU  
SER  
TRP  
ILE  
GLU  
ASP  
GLY  
LYS  
THR  
GLY  
GLN  
VAL  
THR  
PHE  
GLY  
LYS  
GLN  
LYS  
THR  
PHE  
ASN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

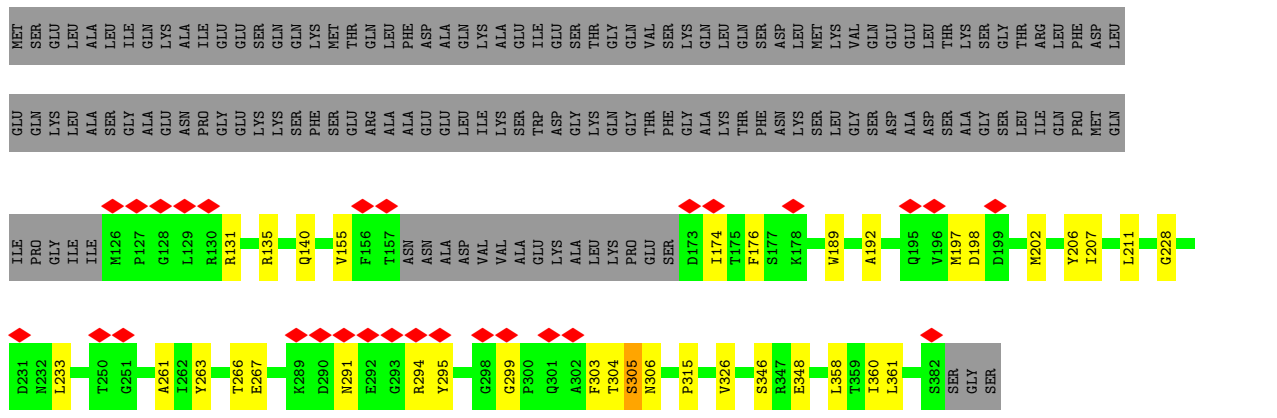
GLU  
GLN  
LYS  
LEU  
ALA  
SER  
GLY  
ALA  
ALA  
LEU  
SER  
GLN  
LYS  
PHE  
SER  
SER  
GLU  
ARG  
ALA  
ALA  
GLU  
ASP  
GLU  
LEU  
ILE  
LYS  
SER  
TRP  
ILE  
ASP  
GLY  
LYS  
THR  
PHE  
ASN  
LYS  
SER  
LEU  
GLY  
SER  
SER  
ASP  
GLU  
ALA  
ASP  
SER  
ALA  
LYS  
GLY  
SER  
SER  
THR  
LEU  
ARG  
LEU  
PHE  
MET  
ASP  
GLN



• Molecule 1: Major capsid subunit



• Molecule 1: Major capsid subunit



## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, I	Depositor
Number of particles used	82275	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	40	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.138	Depositor
Minimum map value	-0.078	Depositor
Average map value	0.002	Depositor
Map value standard deviation	0.007	Depositor
Recommended contour level	0.03	Depositor
Map size (Å)	672.672, 672.672, 672.672	wwPDB
Map dimensions	480, 480, 480	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.4014, 1.4014, 1.4014	Depositor

## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

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	0.25	0/1852	0.51	0/2511
1	B	0.25	0/1910	0.51	0/2589
1	C	0.25	0/1902	0.53	0/2578
1	D	0.26	0/1890	0.52	0/2562
1	E	0.25	0/1894	0.52	0/2567
1	F	0.26	0/1878	0.53	0/2544
1	G	0.27	0/1918	0.53	0/2600
All	All	0.26	0/13244	0.52	0/17951

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 [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	A	1821	1780	1788	15	0
1	B	1877	1835	1843	25	0
1	C	1870	1827	1835	31	0
1	D	1858	1813	1821	21	0
1	E	1862	1823	1831	23	0
1	F	1848	1809	1817	28	0
1	G	1885	1843	1851	22	0
All	All	13021	12730	12786	155	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 6.

All (155) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:135:ARG:NH1	1:C:219:GLU:OE2	2.07	0.88
1:G:304:THR:OG1	1:G:306:ASN:OD1	1.98	0.81
1:F:212:MET:O	1:F:214:GLY:N	2.16	0.79
1:A:263:TYR:O	1:A:266:THR:OG1	2.06	0.73
1:F:185:THR:HG22	1:F:365:ARG:HG2	1.71	0.73
1:C:263:TYR:O	1:C:266:THR:OG1	2.06	0.72
1:E:153:GLU:OE1	1:E:372:ARG:NH2	2.23	0.72
1:C:131:ARG:NH1	1:C:315:PRO:O	2.21	0.71
1:E:233:LEU:HD11	1:E:366:LEU:HD11	1.73	0.70
1:C:314:VAL:HG12	1:C:316:THR:HG23	1.73	0.69
1:C:187:ALA:O	1:C:218:LYS:NZ	2.17	0.69
1:A:233:LEU:HD13	1:A:368:LEU:HD22	1.75	0.68
1:B:155:VAL:HB	1:B:374:THR:HG21	1.76	0.68
1:F:186:ILE:HD12	1:F:222:GLN:HG3	1.77	0.66
1:D:334:GLN:O	1:D:368:LEU:HD12	1.95	0.66
1:C:261:ALA:O	1:C:265:VAL:HG23	1.95	0.65
1:F:265:VAL:HG22	1:F:377:ILE:HD13	1.79	0.65
1:A:138:LEU:HD23	1:A:329:PHE:HB3	1.77	0.65
1:C:237:ASN:O	1:C:378:LYS:NZ	2.25	0.65
1:F:135:ARG:O	1:F:140:GLN:NE2	2.29	0.65
1:A:233:LEU:HD13	1:A:368:LEU:CD2	2.27	0.64
1:F:187:ALA:O	1:F:218:LYS:NZ	2.18	0.64
1:G:197:MET:SD	1:G:360:ILE:HD11	2.37	0.63
1:E:187:ALA:O	1:E:218:LYS:NZ	2.22	0.63
1:E:193:SER:O	1:E:196:VAL:HG22	1.98	0.62
1:D:176:PHE:CZ	1:E:190:VAL:HG23	2.35	0.62
1:E:138:LEU:HD23	1:E:329:PHE:HB3	1.82	0.62
1:G:135:ARG:O	1:G:140:GLN:NE2	2.33	0.62
1:F:138:LEU:HD22	1:F:333:SER:HB2	1.82	0.62
1:F:138:LEU:HD23	1:F:329:PHE:HB3	1.83	0.61
1:B:331:MET:O	1:C:210:ARG:NH1	2.33	0.60
1:E:200:ALA:HB3	1:E:201:PRO:CD	2.30	0.60
1:B:224:LEU:HD21	1:B:319:GLN:OE1	2.02	0.60
1:B:292:GLU:OE1	1:B:294:ARG:NE	2.35	0.59
1:D:176:PHE:CE1	1:E:190:VAL:HG23	2.36	0.59
1:G:131:ARG:NH1	1:G:315:PRO:O	2.35	0.59
1:B:268:SER:HB2	1:B:374:THR:HG23	1.85	0.58

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:200:ALA:HB3	1:F:201:PRO:CD	2.32	0.58
1:B:138:LEU:HD23	1:B:329:PHE:HB3	1.86	0.57
1:B:129:LEU:HD12	1:B:213:TYR:OH	2.05	0.56
1:G:263:TYR:O	1:G:266:THR:OG1	2.18	0.56
1:C:133:THR:HG22	1:C:220:GLU:OE2	2.05	0.56
1:E:150:TYR:OH	1:E:152:ARG:NH2	2.38	0.56
1:C:135:ARG:NH2	1:C:337:ASP:OD2	2.38	0.56
1:G:155:VAL:HG12	1:G:174:ILE:HG22	1.88	0.56
1:G:192:ALA:HB1	1:G:197:MET:CE	2.36	0.55
1:D:290:ASP:OD2	1:G:294:ARG:NH1	2.40	0.55
1:C:155:VAL:HB	1:C:174:ILE:HG22	1.89	0.55
1:E:200:ALA:CB	1:E:201:PRO:CD	2.86	0.54
1:F:299:GLY:O	1:F:302:ALA:N	2.40	0.54
1:E:249:ALA:N	1:E:252:ASP:OD2	2.39	0.54
1:G:261:ALA:HB1	1:G:326:VAL:HG21	1.91	0.53
1:A:213:TYR:CE2	1:A:217:LEU:HD11	2.44	0.53
1:F:200:ALA:CB	1:F:201:PRO:CD	2.86	0.53
1:D:298:GLY:HA3	1:D:304:THR:HG23	1.91	0.52
1:B:227:ASP:OD1	1:B:232:ASN:ND2	2.41	0.52
1:D:138:LEU:HD23	1:D:329:PHE:HB3	1.92	0.52
1:E:227:ASP:OD1	1:E:232:ASN:ND2	2.42	0.52
1:F:196:VAL:HG12	1:F:203:LEU:HD13	1.92	0.52
1:C:131:ARG:HH12	1:C:316:THR:HG22	1.76	0.51
1:F:239:VAL:HG23	1:F:239:VAL:O	2.09	0.51
1:C:275:ILE:HG23	1:C:326:VAL:HG12	1.91	0.51
1:C:334:GLN:O	1:C:368:LEU:HD12	2.11	0.51
1:D:316:THR:HG22	1:D:318:ALA:H	1.76	0.51
1:B:133:THR:HG22	1:B:220:GLU:OE2	2.11	0.50
1:D:243:TYR:OH	1:D:248:ASN:OD1	2.13	0.50
1:D:252:ASP:OD2	1:D:260:HIS:NE2	2.43	0.50
1:E:355:LYS:O	1:E:356:ASN:OD1	2.30	0.50
1:G:263:TYR:O	1:G:266:THR:N	2.38	0.50
1:F:137:LEU:HD21	1:F:329:PHE:CD2	2.47	0.49
1:A:204:GLN:O	1:A:208:ASN:ND2	2.46	0.49
1:E:200:ALA:HB3	1:E:201:PRO:HD2	1.93	0.49
1:A:286:ALA:C	1:A:287:LEU:HD12	2.33	0.49
1:C:186:ILE:HD12	1:C:222:GLN:HG3	1.95	0.49
1:B:243:TYR:HD1	1:B:377:ILE:HD11	1.78	0.49
1:B:326:VAL:O	1:B:377:ILE:HG22	2.12	0.49
1:G:303:PHE:O	1:G:305:SER:N	2.46	0.48
1:E:233:LEU:HD11	1:E:366:LEU:CD1	2.42	0.47

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:292:GLU:OE1	1:F:294:ARG:NH2	2.47	0.47
1:A:133:THR:HG23	1:A:220:GLU:OE2	2.15	0.47
1:B:239:VAL:HG21	1:B:370:HIS:ND1	2.30	0.47
1:F:215:LEU:HD22	1:F:362:CYS:SG	2.54	0.47
1:B:227:ASP:O	1:B:232:ASN:HB2	2.15	0.47
1:B:264:GLN:NE2	1:B:377:ILE:HD12	2.29	0.47
1:F:375:ALA:O	1:F:377:ILE:HD12	2.15	0.47
1:A:265:VAL:HG22	1:A:377:ILE:HD13	1.96	0.47
1:G:192:ALA:HB1	1:G:197:MET:HE3	1.97	0.46
1:G:207:ILE:HG22	1:G:211:LEU:HD12	1.97	0.46
1:D:233:LEU:HD11	1:D:366:LEU:HD11	1.98	0.46
1:F:265:VAL:HG22	1:F:377:ILE:CD1	2.44	0.46
1:C:227:ASP:OD1	1:C:232:ASN:ND2	2.49	0.46
1:G:211:LEU:HD11	1:G:360:ILE:CG2	2.46	0.46
1:C:227:ASP:OD2	1:C:229:THR:OG1	2.31	0.46
1:F:196:VAL:CG1	1:F:203:LEU:HD13	2.45	0.46
1:D:194:ARG:HB3	1:D:358:LEU:HG	1.96	0.45
1:G:267:GLU:HA	1:G:267:GLU:OE1	2.16	0.45
1:C:132:LEU:HD23	1:C:132:LEU:H	1.80	0.45
1:C:178:LYS:NZ	1:D:356:ASN:O	2.49	0.45
1:C:277:LEU:O	1:C:315:PRO:HA	2.17	0.45
1:F:200:ALA:HB3	1:F:201:PRO:HD2	1.98	0.45
1:G:202:MET:O	1:G:206:TYR:HB2	2.16	0.45
1:D:234:GLU:O	1:D:368:LEU:HD23	2.16	0.45
1:D:335:VAL:HG22	1:D:335:VAL:O	2.17	0.45
1:F:296:ILE:HG22	1:F:297:PHE:H	1.82	0.45
1:G:189:TRP:HB3	1:G:361:LEU:HD12	1.98	0.45
1:A:138:LEU:HD22	1:A:333:SER:HB2	2.00	0.44
1:F:234:GLU:O	1:F:368:LEU:HD23	2.17	0.44
1:B:151:VAL:HG21	1:C:192:ALA:HB2	1.98	0.44
1:C:377:ILE:HG22	1:C:378:LYS:O	2.17	0.44
1:A:288:LEU:H	1:A:288:LEU:HD23	1.81	0.44
1:F:265:VAL:CG2	1:F:377:ILE:HD13	2.47	0.44
1:F:290:ASP:N	1:F:290:ASP:OD1	2.51	0.44
1:E:135:ARG:O	1:E:140:GLN:NE2	2.47	0.44
1:E:199:ASP:O	1:E:201:PRO:HD2	2.17	0.44
1:A:198:ASP:O	1:A:199:ASP:OD1	2.36	0.44
1:F:207:ILE:O	1:F:211:LEU:HB2	2.18	0.44
1:E:332:ALA:HB2	1:E:375:ALA:HB3	1.99	0.43
1:E:351:ASP:OD1	1:E:351:ASP:N	2.49	0.43
1:C:272:ALA:O	1:D:317:LYS:NZ	2.38	0.43

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:345:VAL:HG12	1:B:358:LEU:HD11	1.99	0.43
1:B:354:VAL:HG12	1:B:355:LYS:N	2.34	0.43
1:F:155:VAL:HG22	1:F:174:ILE:HG12	1.99	0.43
1:G:228:GLY:N	1:G:233:LEU:O	2.51	0.43
1:C:288:LEU:HB3	1:C:296:ILE:HD12	2.00	0.43
1:D:282:TRP:NE1	1:D:303:PHE:HB3	2.33	0.43
1:D:191:GLN:HB2	1:D:358:LEU:O	2.18	0.43
1:B:148:LEU:HD22	1:C:202:MET:CE	2.48	0.43
1:C:275:ILE:HG22	1:C:276:VAL:N	2.34	0.43
1:B:239:VAL:HG12	1:B:373:PRO:HB3	1.99	0.43
1:B:335:VAL:CG1	1:B:366:LEU:HD11	2.49	0.43
1:D:304:THR:O	1:D:304:THR:HG22	2.18	0.43
1:F:244:ASP:OD2	1:F:246:SER:OG	2.36	0.43
1:A:252:ASP:N	1:A:252:ASP:OD1	2.51	0.42
1:C:240:ALA:HB3	1:C:378:LYS:HG3	2.02	0.42
1:G:295:TYR:OH	1:G:299:GLY:HA3	2.19	0.42
1:F:261:ALA:O	1:F:265:VAL:HG23	2.20	0.42
1:B:190:VAL:HG12	1:G:176:PHE:CZ	2.54	0.42
1:D:254:ARG:NH1	1:D:281:ASP:OD1	2.53	0.42
1:B:288:LEU:HB3	1:B:296:ILE:HD13	2.01	0.42
1:E:213:TYR:HE1	1:E:217:LEU:HD11	1.85	0.42
1:E:291:ASN:OD1	1:E:292:GLU:N	2.53	0.42
1:G:346:SER:OG	1:G:348:GLU:O	2.37	0.42
1:A:195:GLN:NE2	1:A:199:ASP:OD2	2.53	0.41
1:G:198:ASP:OD2	1:G:358:LEU:HD11	2.20	0.41
1:C:253:THR:HG22	1:C:254:ARG:N	2.36	0.41
1:B:143:THR:OG1	1:B:148:LEU:HD11	2.20	0.41
1:B:264:GLN:CD	1:B:377:ILE:HD12	2.40	0.41
1:E:208:ASN:OD1	1:E:209:ASN:N	2.54	0.41
1:C:211:LEU:HD23	1:C:362:CYS:SG	2.60	0.41
1:D:346:SER:O	1:D:347:ARG:HB3	2.20	0.41
1:B:277:LEU:O	1:B:315:PRO:HA	2.21	0.41
1:D:247:LEU:HD23	1:D:260:HIS:HB3	2.02	0.41
1:C:138:LEU:O	1:C:140:GLN:NE2	2.51	0.41
1:C:341:ALA:HA	1:C:363:GLU:O	2.21	0.41
1:A:208:ASN:OD1	1:A:209:ASN:OD1	2.39	0.41

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	230/385 (60%)	219 (95%)	11 (5%)	0	100	100
1	B	237/385 (62%)	217 (92%)	19 (8%)	1 (0%)	34	64
1	C	236/385 (61%)	225 (95%)	11 (5%)	0	100	100
1	D	234/385 (61%)	215 (92%)	19 (8%)	0	100	100
1	E	235/385 (61%)	226 (96%)	8 (3%)	1 (0%)	34	64
1	F	231/385 (60%)	220 (95%)	10 (4%)	1 (0%)	34	64
1	G	238/385 (62%)	222 (93%)	15 (6%)	1 (0%)	34	64
All	All	1641/2695 (61%)	1544 (94%)	93 (6%)	4 (0%)	50	77

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	E	200	ALA
1	F	200	ALA
1	B	149	GLU
1	G	305	SER

### 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	193/318 (61%)	193 (100%)	0	100	100
1	B	199/318 (63%)	199 (100%)	0	100	100

*Continued on next page...*

Continued from previous page...

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	C	198/318 (62%)	198 (100%)	0	100	100
1	D	197/318 (62%)	197 (100%)	0	100	100
1	E	197/318 (62%)	197 (100%)	0	100	100
1	F	196/318 (62%)	196 (100%)	0	100	100
1	G	200/318 (63%)	199 (100%)	1 (0%)	88	94
All	All	1380/2226 (62%)	1379 (100%)	1 (0%)	93	97

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

Mol	Chain	Res	Type
1	G	291	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (3) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	209	ASN
1	B	283	HIS
1	F	209	ASN

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

## 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 monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

There are no ligands in this entry.

## 5.7 Other polymers

There are no such residues in this entry.

## 5.8 Polymer linkage issues

There are no chain breaks in this entry.

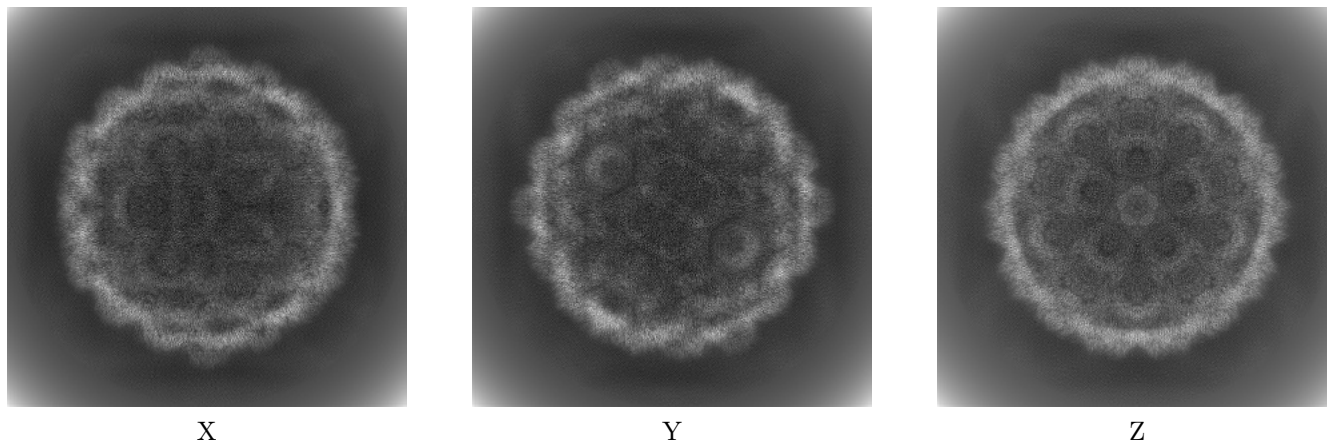
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-16624. These allow visual inspection of the internal detail of the map and identification of artifacts.

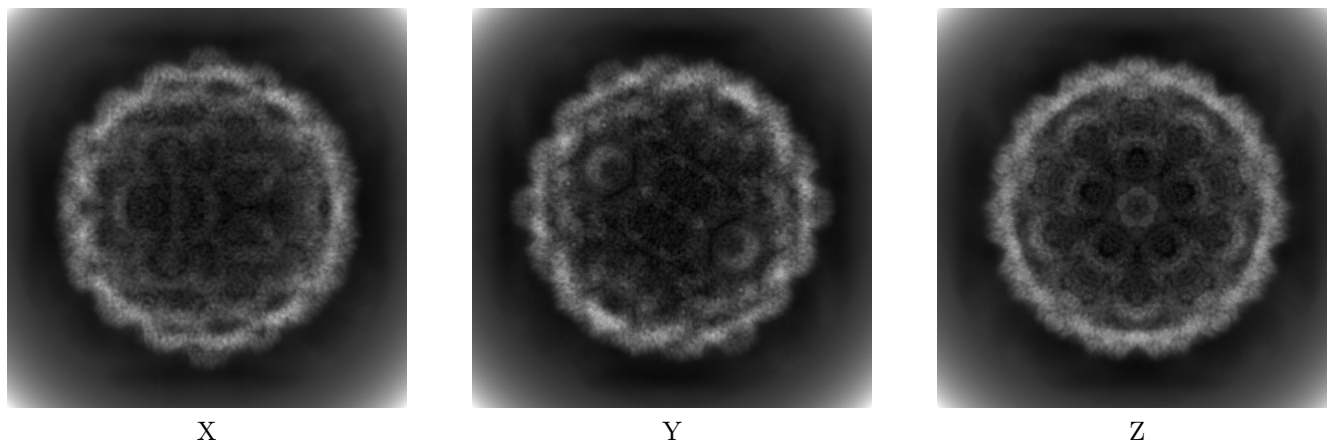
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

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

#### 6.1.1 Primary map



#### 6.1.2 Raw map

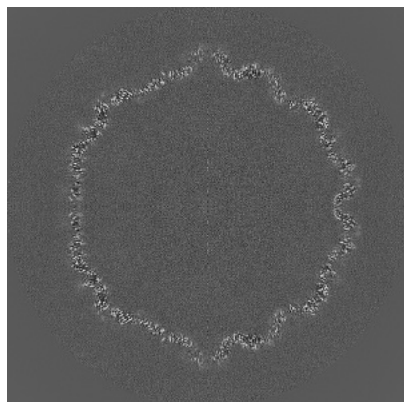


The images above show the map projected in three orthogonal directions.

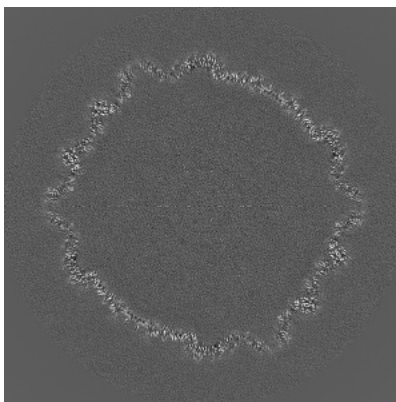


## 6.2 Central slices [i](#)

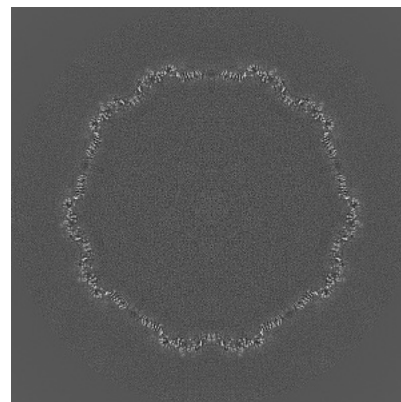
### 6.2.1 Primary map



X Index: 240

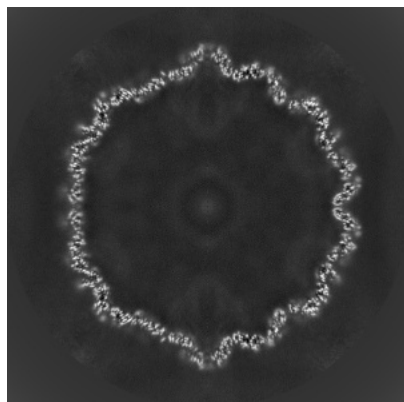


Y Index: 240

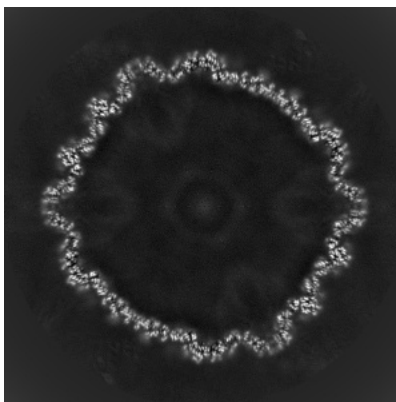


Z Index: 240

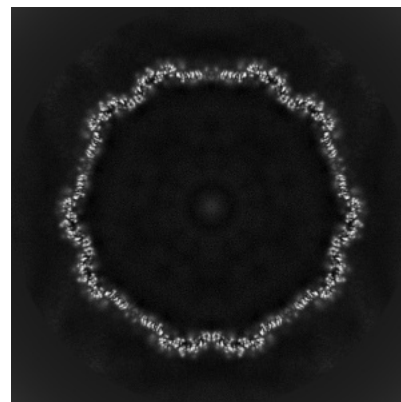
### 6.2.2 Raw map



X Index: 240



Y Index: 240

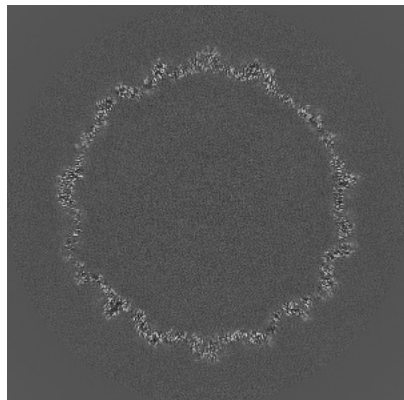


Z Index: 240

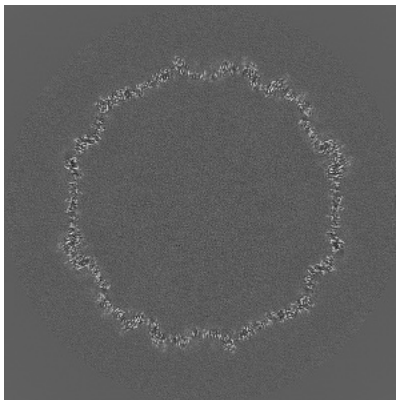
The images above show central slices of the map in three orthogonal directions.

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

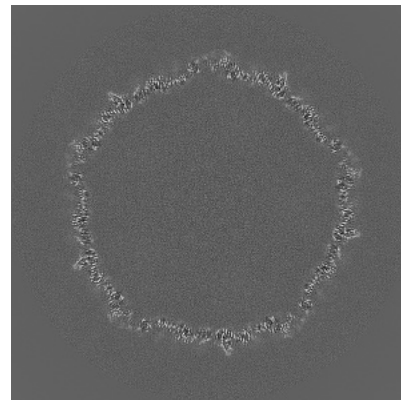
### 6.3.1 Primary map



X Index: 222

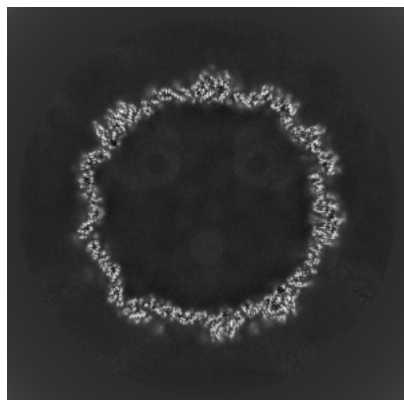


Y Index: 276

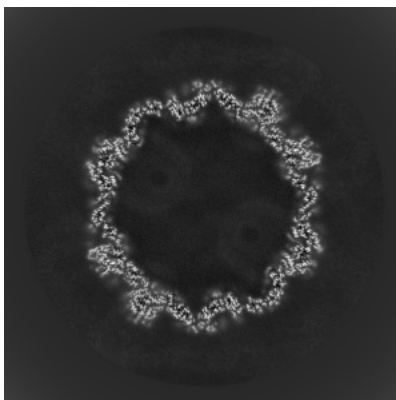


Z Index: 206

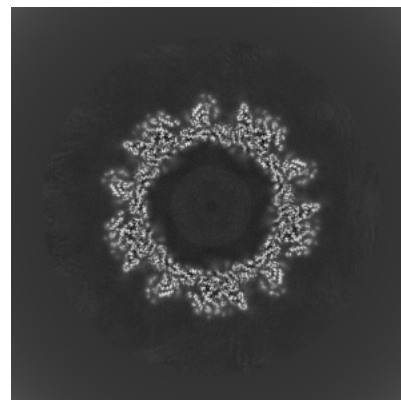
### 6.3.2 Raw map



X Index: 322



Y Index: 348

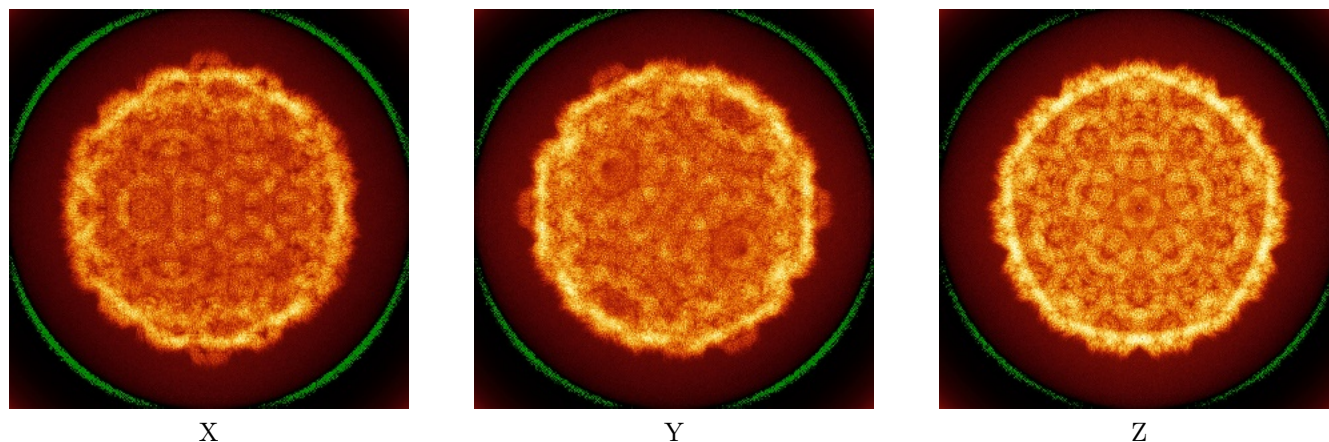


Z Index: 109

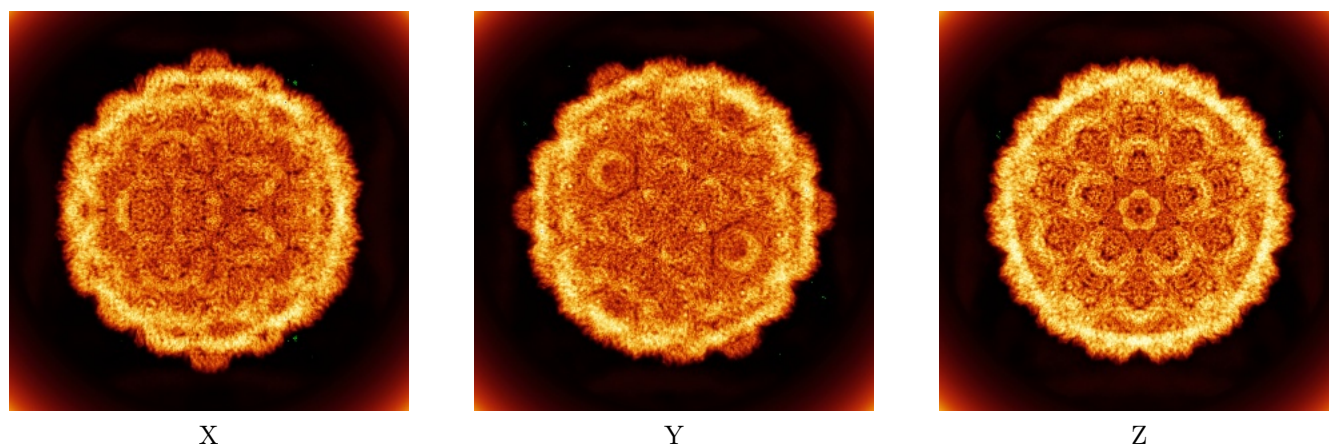
The images above show the largest variance slices of the map in three orthogonal directions.

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

### 6.4.1 Primary map



### 6.4.2 Raw map

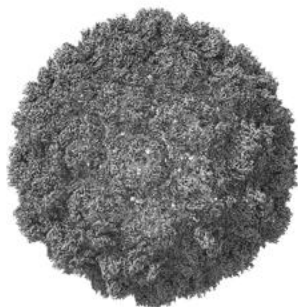


The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.



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

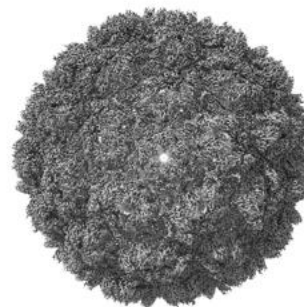
### 6.5.1 Primary map



X



Y



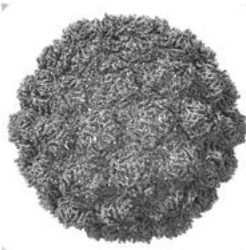
Z

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

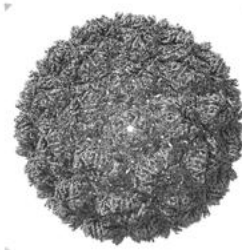
### 6.5.2 Raw map



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.

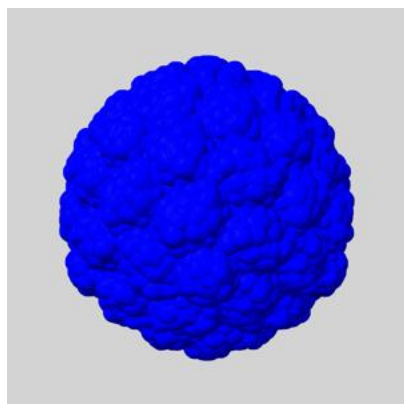
## 6.6 Mask visualisation [i](#)

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

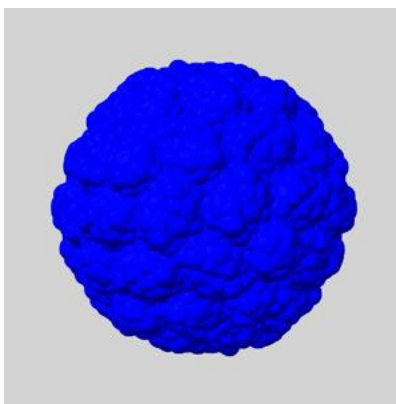
A mask typically either:

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

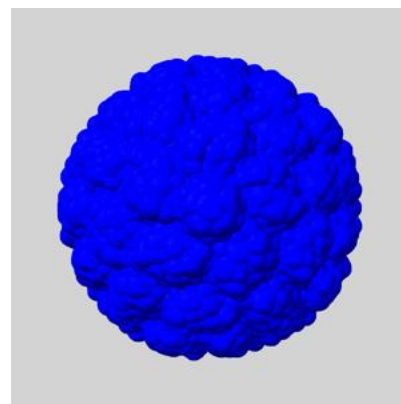
### 6.6.1 emd\_16624\_msk\_1.map [i](#)



X



Y

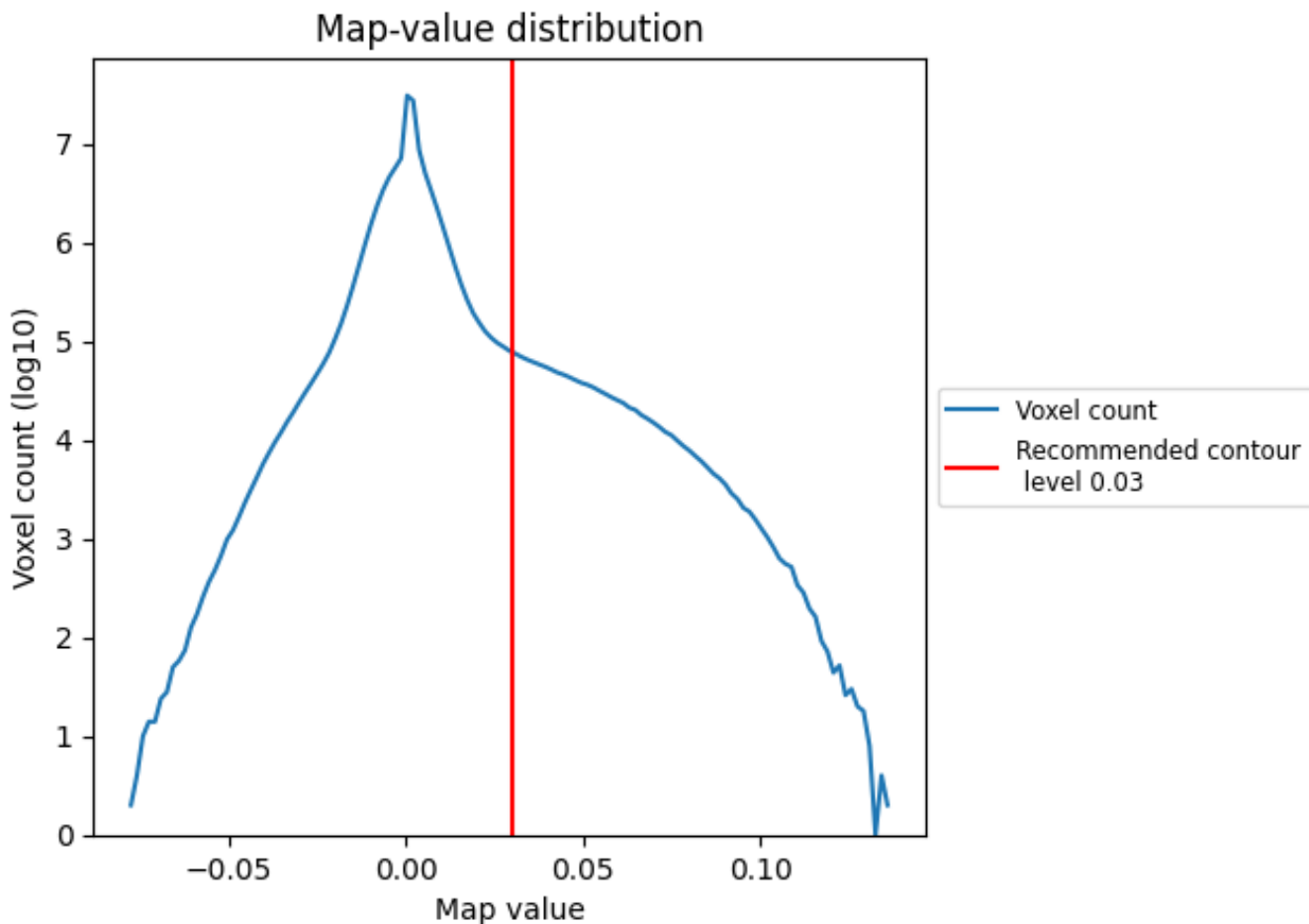


Z

## 7 Map analysis [i](#)

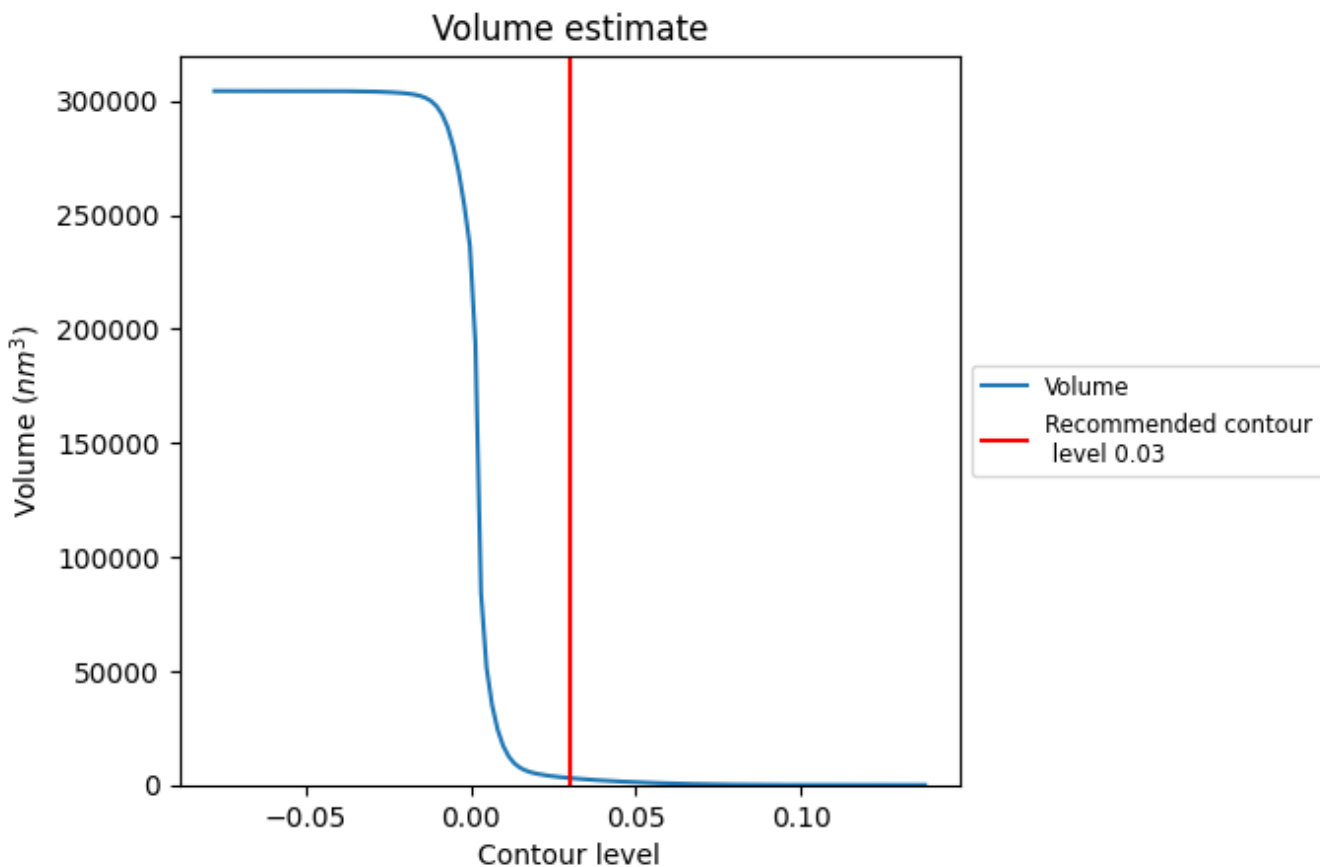
This section contains the results of statistical analysis of the map.

### 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.

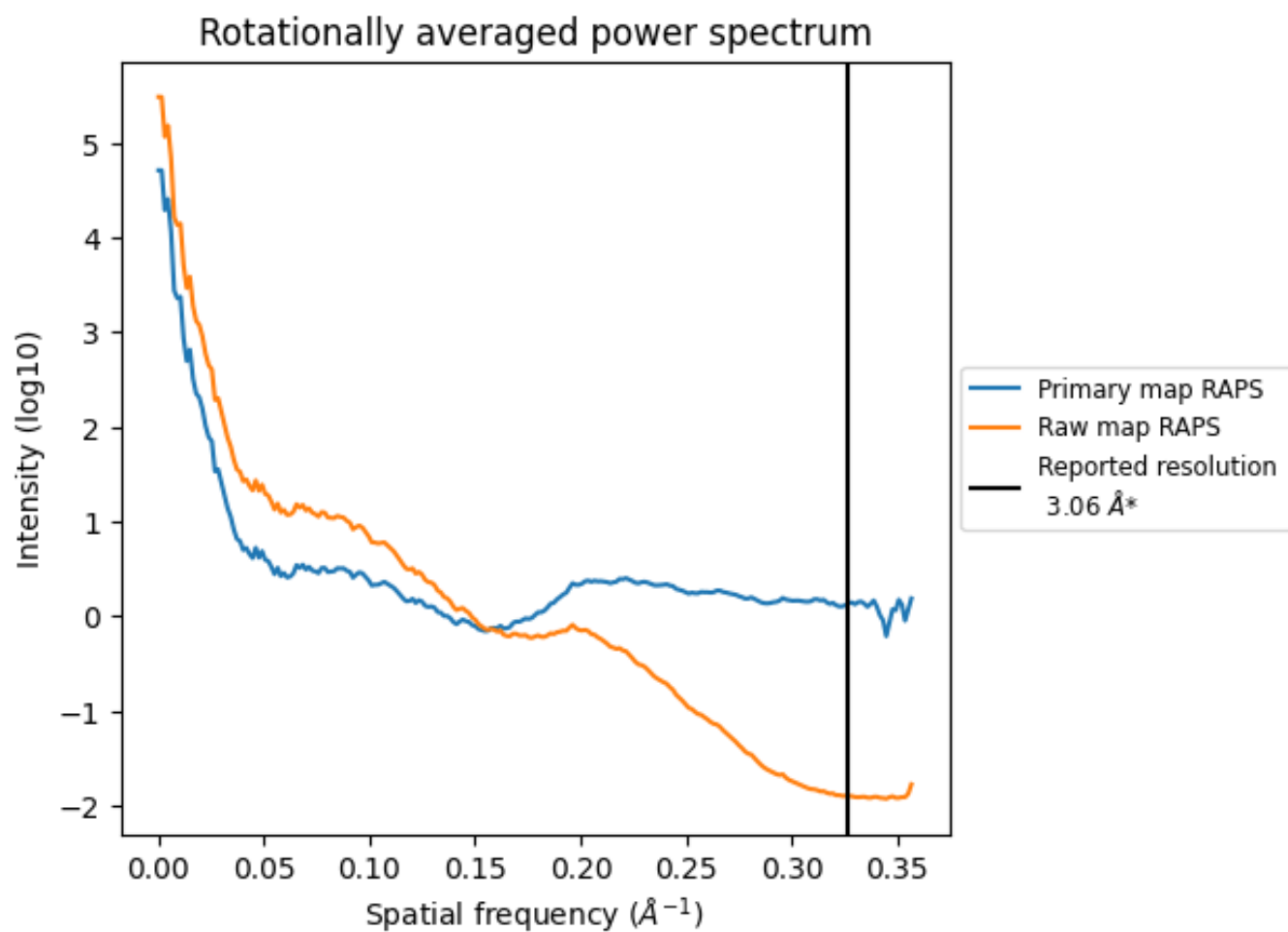
## 7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 3029 nm<sup>3</sup>; this corresponds to an approximate mass of 2736 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](#)



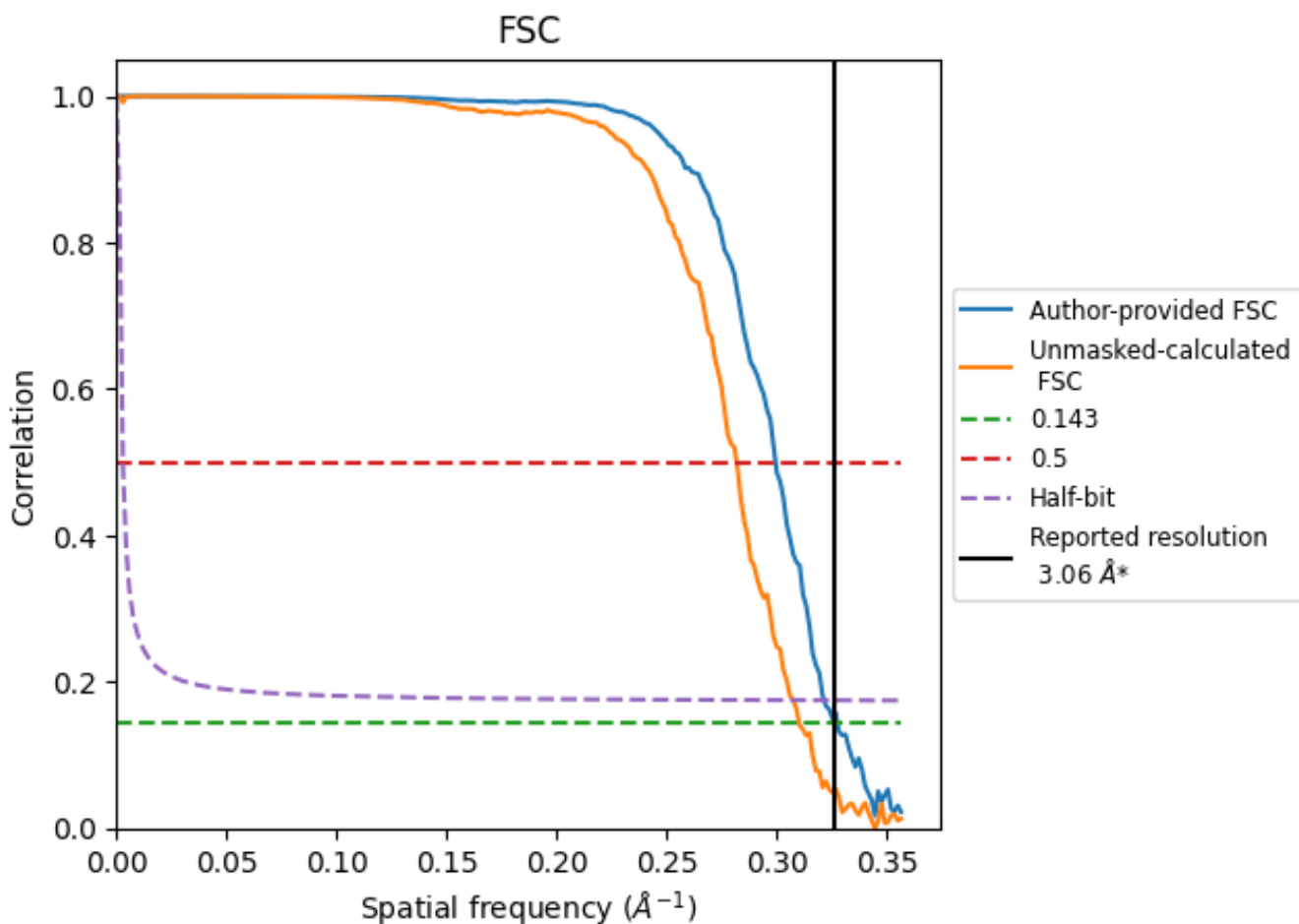
\*Reported resolution corresponds to spatial frequency of 0.327 Å<sup>-1</sup>



## 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 0.327 Å<sup>-1</sup>

## 8.2 Resolution estimates [i](#)

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.06	-	-
Author-provided FSC curve	3.05	3.34	3.11
Unmasked-calculated*	3.22	3.55	3.25

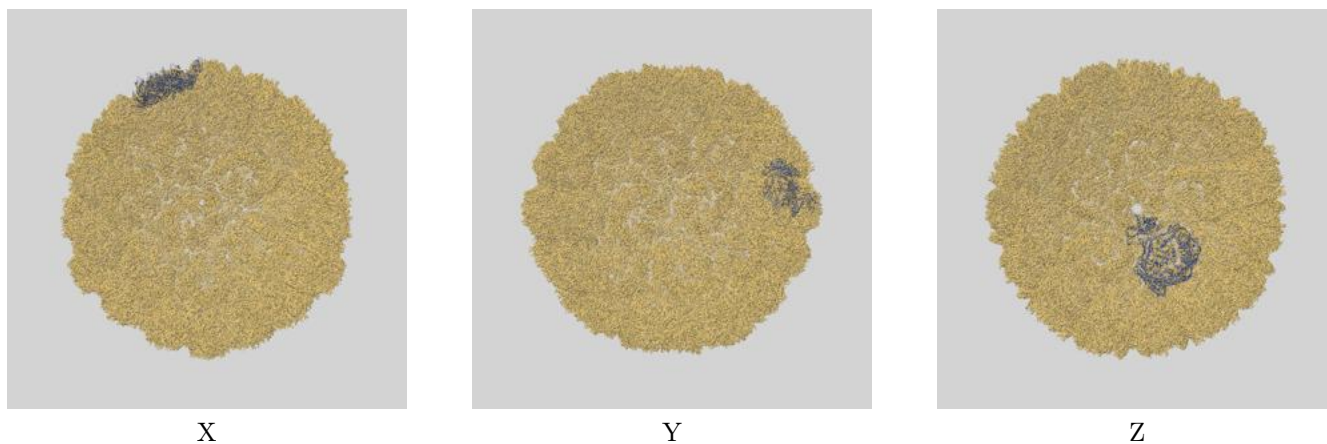
\*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps.

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

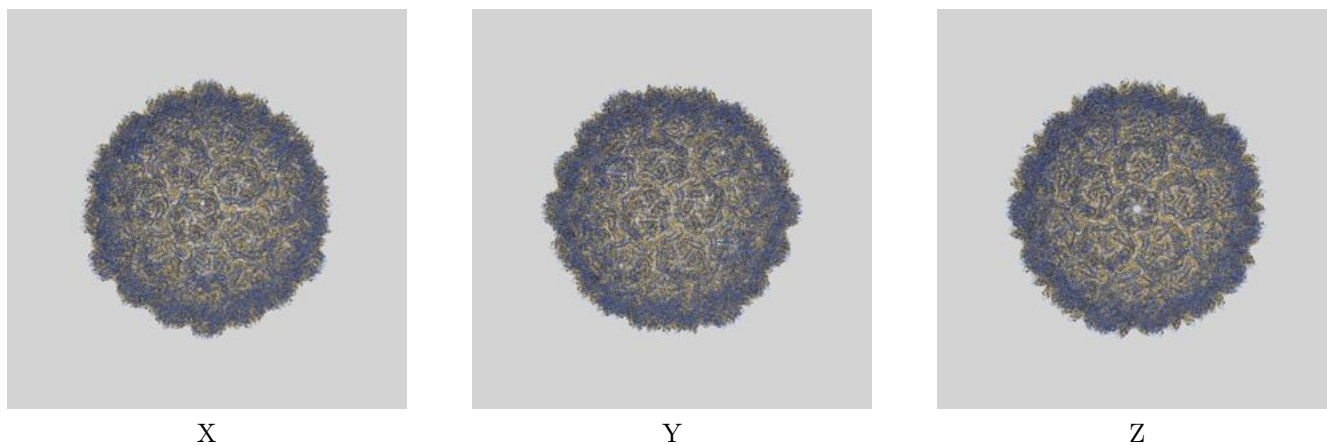
This section contains information regarding the fit between EMDB map EMD-16624 and PDB model 8CFA. Per-residue inclusion information can be found in section 3 on page 4.

### 9.1 Map-model overlays

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



#### 9.1.2 Map-model assembly overlay [i](#)



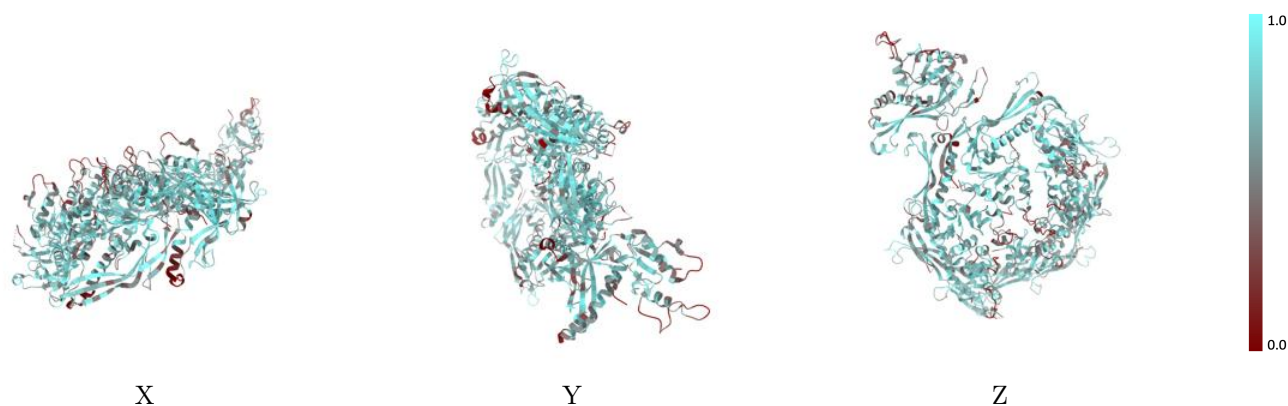
The images above show the 3D surface view of the map at the recommended contour level 0.03 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



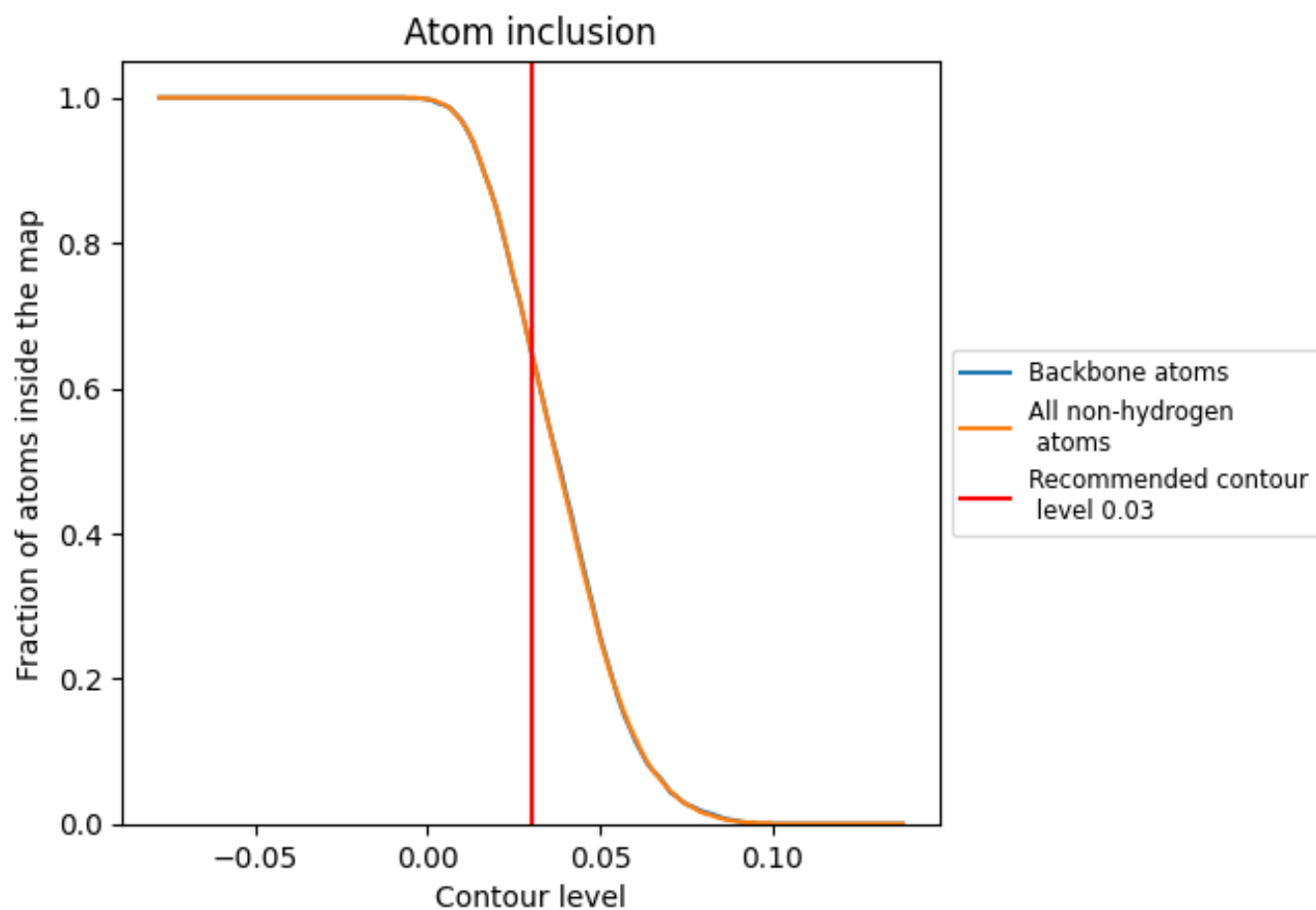
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.03).

















## 9.4 Atom inclusion [i](#)



At the recommended contour level, 65% of all backbone atoms, 65% of all non-hydrogen atoms, are inside the map.

## 9.5 Map-model fit summary

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

Chain	Atom inclusion	Q-score
All	 0.6510	 0.5570
A	 0.5740	 0.5520
B	 0.6730	 0.5620
C	 0.6710	 0.5620
D	 0.6850	 0.5540
E	 0.6400	 0.5620
F	 0.6580	 0.5440
G	 0.6990	 0.5670

