W O R L D W I D E
wwPDB
PROTEIN DATA BANK

wwPDB EM Validation Summary Report (i)

Feb 27, 2024 – 09:42 AM EST

PDB ID	:	6UTH
EMDB ID	:	EMD-20879
Title	:	Allosteric coupling between alpha-rings of 20S proteasome, 20S proteasome singly capped with a PA26/E102A_PANc, together with LFP incubation
Authors	:	Cheng, Y.; Yu, Z.
Deposited on	:	2019-10-29
Resolution	:	3.40 Å(reported)

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

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/EMValidationReportHelp
with specific help available everywhere you see the (i) 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 (i)) were used in the production of this report:

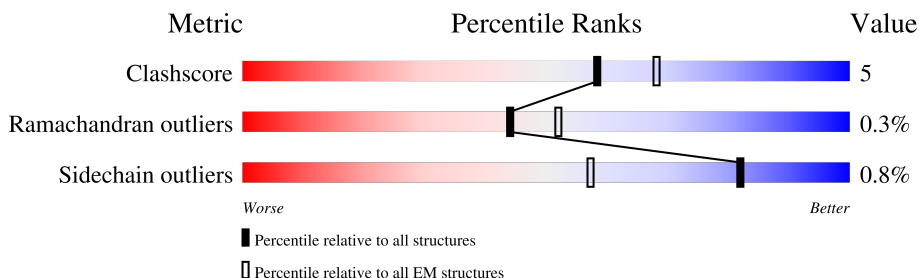|		
EMDB validation analysis	:	0.0.1.dev70
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

1 Overall quality at a glance ⓘ

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

The reported resolution of this entry is 3.40 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.
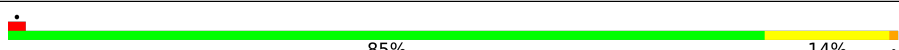
Metric	Percentile Ranks	Value
Clashscore		5
Ramachandran outliers		0.3%
Sidechain outliers		0.8%

Worse   *Better*

▌ Percentile relative to all structures

▯ Percentile relative to all EM structures
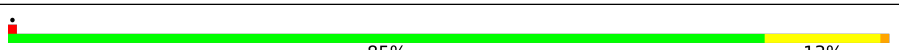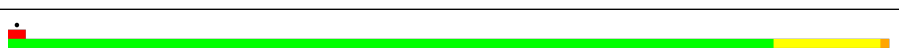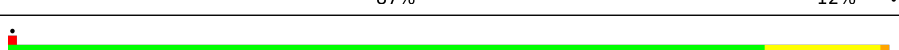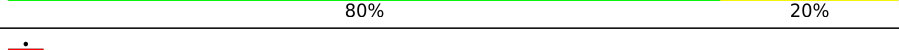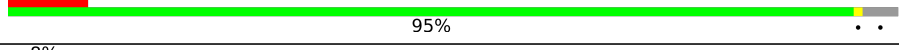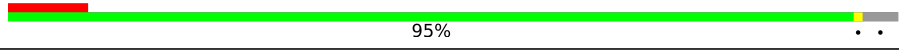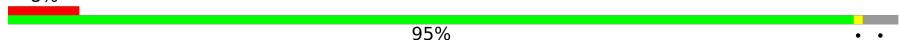
Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion < 40%). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	227	10% / 89% / 10%
1	B	227	10% / 89% / 10%
1	C	227	10% / 89% / 10%
1	D	227	10% / 89% / 10%
1	E	227	10% / 91% / 8%
1	F	227	11% / 90% / 9%
1	G	227	11% / 89% / 10%
2	1	203	• / 86% / 12% •
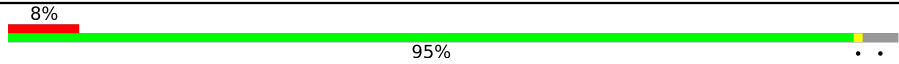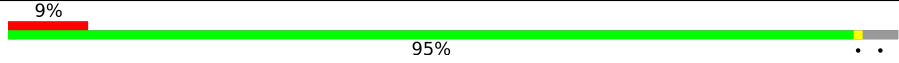
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Mol	Chain	Length	Quality of chain
2	2	203	85% 14%
2	H	203	84% 14%
2	I	203	83% 15%
2	J	203	85% 13%
2	K	203	85% 14%
2	L	203	85% 14%
2	M	203	85% 13%
2	N	203	86% 13%
2	V	203	86% 12%
2	W	203	87% 12%
2	X	203	85% 13%
2	Y	203	88% 11%
2	Z	203	87% 11%
3	O	227	81% 19%
3	P	227	5% 80% 20%
3	Q	227	80% 20%
3	R	227	79% 21%
3	S	227	79% 21%
3	T	227	5% 79% 21%
3	U	227	80% 19%
4	a	229	9% 95%
4	b	229	8% 95%
4	c	229	9% 95%
4	d	229	8% 95%
4	e	229	8% 95%

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Mol	Chain	Length	Quality of chain
4	f	229	8% 95%
4	g	229	9% 95%

2　Entry composition ⓘ

There are 4 unique types of molecules in this entry. The entry contains 58394 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 Proteasome subunit alpha.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	227	Total	C	N	O	S	0	0
			1765	1120	298	344	3		
1	B	227	Total	C	N	O	S	0	0
			1765	1120	298	344	3		
1	C	227	Total	C	N	O	S	0	0
			1765	1120	298	344	3		
1	D	227	Total	C	N	O	S	0	0
			1765	1120	298	344	3		
1	E	227	Total	C	N	O	S	0	0
			1765	1120	298	344	3		
1	F	227	Total	C	N	O	S	0	0
			1765	1120	298	344	3		
1	G	227	Total	C	N	O	S	0	0
			1765	1120	298	344	3		

There are 7 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	66	ALA	LYS	conflict	UNP P25156
B	66	ALA	LYS	conflict	UNP P25156
C	66	ALA	LYS	conflict	UNP P25156
D	66	ALA	LYS	conflict	UNP P25156
E	66	ALA	LYS	conflict	UNP P25156
F	66	ALA	LYS	conflict	UNP P25156
G	66	ALA	LYS	conflict	UNP P25156

- Molecule 2 is a protein called Proteasome subunit beta.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	Z	203	Total	C	N	O	S	0	0
			1558	985	264	298	11		
2	M	203	Total	C	N	O	S	0	0
			1558	985	264	298	11		

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Mol	Chain	Residues	Atoms					AltConf	Trace
2	1	203	Total	C	N	O	S	0	0
			1558	985	264	298	11		
2	N	203	Total	C	N	O	S	0	0
			1558	985	264	298	11		
2	2	203	Total	C	N	O	S	0	0
			1558	985	264	298	11		
2	H	203	Total	C	N	O	S	0	0
			1558	985	264	298	11		
2	V	203	Total	C	N	O	S	0	0
			1558	985	264	298	11		
2	I	203	Total	C	N	O	S	0	0
			1558	985	264	298	11		
2	W	203	Total	C	N	O	S	0	0
			1558	985	264	298	11		
2	J	203	Total	C	N	O	S	0	0
			1558	985	264	298	11		
2	X	203	Total	C	N	O	S	0	0
			1558	985	264	298	11		
2	K	203	Total	C	N	O	S	0	0
			1558	985	264	298	11		
2	Y	203	Total	C	N	O	S	0	0
			1558	985	264	298	11		
2	L	203	Total	C	N	O	S	0	0
			1558	985	264	298	11		

- Molecule 3 is a protein called Proteasome subunit alpha.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	O	227	Total	C	N	O	S	0	0
			1769	1123	299	344	3		
3	P	227	Total	C	N	O	S	0	0
			1769	1123	299	344	3		
3	Q	227	Total	C	N	O	S	0	0
			1769	1123	299	344	3		
3	R	227	Total	C	N	O	S	0	0
			1769	1123	299	344	3		
3	S	227	Total	C	N	O	S	0	0
			1769	1123	299	344	3		
3	T	227	Total	C	N	O	S	0	0
			1769	1123	299	344	3		
3	U	227	Total	C	N	O	S	0	0
			1769	1123	299	344	3		

- Molecule 4 is a protein called Proteasome activator protein PA26.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	a	219	Total 1692	C 1063	N 300	O 324	S 5	0	0
4	b	219	Total 1692	C 1063	N 300	O 324	S 5	0	0
4	c	219	Total 1692	C 1063	N 300	O 324	S 5	0	0
4	d	219	Total 1692	C 1063	N 300	O 324	S 5	0	0
4	e	219	Total 1692	C 1063	N 300	O 324	S 5	0	0
4	f	219	Total 1692	C 1063	N 300	O 324	S 5	0	0
4	g	219	Total 1692	C 1063	N 300	O 324	S 5	0	0

There are 77 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
a	48	GLY	ALA	conflict	UNP Q38BM8
a	102	ALA	GLU	conflict	UNP Q38BM8
a	224	GLY	-	expression tag	UNP Q38BM8
a	225	GLY	-	expression tag	UNP Q38BM8
a	226	HIS	-	expression tag	UNP Q38BM8
a	227	LEU	-	expression tag	UNP Q38BM8
a	228	ASP	-	expression tag	UNP Q38BM8
a	229	VAL	-	expression tag	UNP Q38BM8
a	230	LEU	-	expression tag	UNP Q38BM8
a	231	TYR	-	expression tag	UNP Q38BM8
a	232	ARG	-	expression tag	UNP Q38BM8
b	48	GLY	ALA	conflict	UNP Q38BM8
b	102	ALA	GLU	conflict	UNP Q38BM8
b	224	GLY	-	expression tag	UNP Q38BM8
b	225	GLY	-	expression tag	UNP Q38BM8
b	226	HIS	-	expression tag	UNP Q38BM8
b	227	LEU	-	expression tag	UNP Q38BM8
b	228	ASP	-	expression tag	UNP Q38BM8
b	229	VAL	-	expression tag	UNP Q38BM8
b	230	LEU	-	expression tag	UNP Q38BM8
b	231	TYR	-	expression tag	UNP Q38BM8
b	232	ARG	-	expression tag	UNP Q38BM8
c	48	GLY	ALA	conflict	UNP Q38BM8
c	102	ALA	GLU	conflict	UNP Q38BM8

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Chain	Residue	Modelled	Actual	Comment	Reference
c	224	GLY	-	expression tag	UNP Q38BM8
c	225	GLY	-	expression tag	UNP Q38BM8
c	226	HIS	-	expression tag	UNP Q38BM8
c	227	LEU	-	expression tag	UNP Q38BM8
c	228	ASP	-	expression tag	UNP Q38BM8
c	229	VAL	-	expression tag	UNP Q38BM8
c	230	LEU	-	expression tag	UNP Q38BM8
c	231	TYR	-	expression tag	UNP Q38BM8
c	232	ARG	-	expression tag	UNP Q38BM8
d	48	GLY	ALA	conflict	UNP Q38BM8
d	102	ALA	GLU	conflict	UNP Q38BM8
d	224	GLY	-	expression tag	UNP Q38BM8
d	225	GLY	-	expression tag	UNP Q38BM8
d	226	HIS	-	expression tag	UNP Q38BM8
d	227	LEU	-	expression tag	UNP Q38BM8
d	228	ASP	-	expression tag	UNP Q38BM8
d	229	VAL	-	expression tag	UNP Q38BM8
d	230	LEU	-	expression tag	UNP Q38BM8
d	231	TYR	-	expression tag	UNP Q38BM8
d	232	ARG	-	expression tag	UNP Q38BM8
e	48	GLY	ALA	conflict	UNP Q38BM8
e	102	ALA	GLU	conflict	UNP Q38BM8
e	224	GLY	-	expression tag	UNP Q38BM8
e	225	GLY	-	expression tag	UNP Q38BM8
e	226	HIS	-	expression tag	UNP Q38BM8
e	227	LEU	-	expression tag	UNP Q38BM8
e	228	ASP	-	expression tag	UNP Q38BM8
e	229	VAL	-	expression tag	UNP Q38BM8
e	230	LEU	-	expression tag	UNP Q38BM8
e	231	TYR	-	expression tag	UNP Q38BM8
e	232	ARG	-	expression tag	UNP Q38BM8
f	48	GLY	ALA	conflict	UNP Q38BM8
f	102	ALA	GLU	conflict	UNP Q38BM8
f	224	GLY	-	expression tag	UNP Q38BM8
f	225	GLY	-	expression tag	UNP Q38BM8
f	226	HIS	-	expression tag	UNP Q38BM8
f	227	LEU	-	expression tag	UNP Q38BM8
f	228	ASP	-	expression tag	UNP Q38BM8
f	229	VAL	-	expression tag	UNP Q38BM8
f	230	LEU	-	expression tag	UNP Q38BM8
f	231	TYR	-	expression tag	UNP Q38BM8
f	232	ARG	-	expression tag	UNP Q38BM8

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Chain	Residue	Modelled	Actual	Comment	Reference
g	48	GLY	ALA	conflict	UNP Q38BM8
g	102	ALA	GLU	conflict	UNP Q38BM8
g	224	GLY	-	expression tag	UNP Q38BM8
g	225	GLY	-	expression tag	UNP Q38BM8
g	226	HIS	-	expression tag	UNP Q38BM8
g	227	LEU	-	expression tag	UNP Q38BM8
g	228	ASP	-	expression tag	UNP Q38BM8
g	229	VAL	-	expression tag	UNP Q38BM8
g	230	LEU	-	expression tag	UNP Q38BM8
g	231	TYR	-	expression tag	UNP Q38BM8
g	232	ARG	-	expression tag	UNP Q38BM8

3　Residue-property plots ⓘ

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion in map density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red diamond above a residue indicates a poor fit to the EM map for this residue (all-atom inclusion < 40%). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

- Molecule 1: Proteasome subunit alpha

Chain A:

- Molecule 1: Proteasome subunit alpha

Chain B:

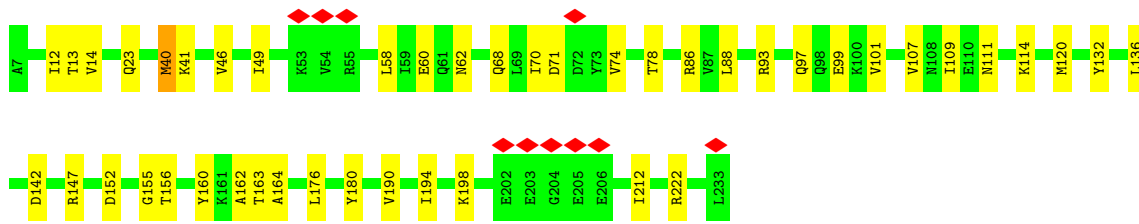- Molecule 1: Proteasome subunit alpha

Chain C:

- Molecule 1: Proteasome subunit alpha

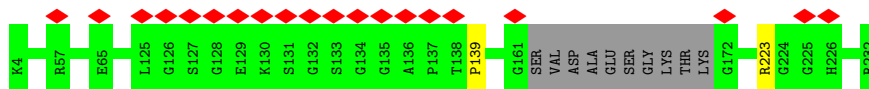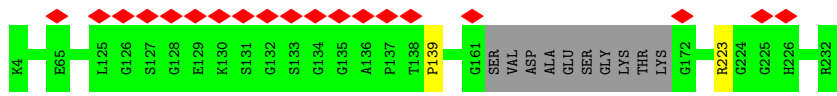Chain D:

• Molecule 1: Proteasome subunit alpha

Chain E:

• Molecule 1: Proteasome subunit alpha

Chain F:

• Molecule 1: Proteasome subunit alpha

Chain G:

• Molecule 2: Proteasome subunit beta

Chain Z:

• Molecule 2: Proteasome subunit beta

Chain M:

- Molecule 2: Proteasome subunit beta

Chain 1:

- Molecule 2: Proteasome subunit beta

Chain N:

- Molecule 2: Proteasome subunit beta

Chain 2:

- Molecule 2: Proteasome subunit beta

Chain H:

- Molecule 2: Proteasome subunit beta

Chain V:

- Molecule 2: Proteasome subunit beta

Chain I:

• Molecule 2: Proteasome subunit beta

Chain W:

• Molecule 2: Proteasome subunit beta

Chain J:

• Molecule 2: Proteasome subunit beta

Chain X:

• Molecule 2: Proteasome subunit beta

Chain K:

• Molecule 2: Proteasome subunit beta

Chain Y:

• Molecule 2: Proteasome subunit beta

Chain L:

• Molecule 3: Proteasome subunit alpha

Chain O:

• Molecule 3: Proteasome subunit alpha

Chain P:

• Molecule 3: Proteasome subunit alpha

Chain Q:

• Molecule 3: Proteasome subunit alpha

Chain R:

• Molecule 3: Proteasome subunit alpha

Chain S:

79% 21%

• Molecule 3: Proteasome subunit alpha

Chain T:

5%

79% 21%

• Molecule 3: Proteasome subunit alpha

Chain U:

80% 19%

• Molecule 4: Proteasome activator protein PA26

Chain a:

9%

95%

• Molecule 4: Proteasome activator protein PA26

Chain b:

8%

95%

• Molecule 4: Proteasome activator protein PA26

Chain c:

9%

95%

• Molecule 4: Proteasome activator protein PA26

Chain d:

• Molecule 4: Proteasome activator protein PA26

Chain e:

• Molecule 4: Proteasome activator protein PA26

Chain f:

• Molecule 4: Proteasome activator protein PA26

Chain g:

4 Experimental information ⓘ

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	55000	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TALOS ARCTICA	Depositor
Voltage (kV)	200	Depositor
Electron dose $(e^-/\text{Å}^2)$	60	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	6.398	Depositor
Minimum map value	-4.706	Depositor
Average map value	-0.001	Depositor
Map value standard deviation	0.220	Depositor
Recommended contour level	0.655	Depositor
Map size (Å)	368.0, 368.0, 368.0	wwPDB
Map dimensions	320, 320, 320	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.15, 1.15, 1.15	Depositor

5   Model quality ⓘ

5.1   Standard geometry ⓘ

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
1	A	0.48	0/1789	0.73	2/2412 (0.1%)
1	B	0.48	0/1789	0.73	2/2412 (0.1%)
1	C	0.48	0/1789	0.73	2/2412 (0.1%)
1	D	0.48	0/1789	0.73	2/2412 (0.1%)
1	E	0.47	0/1789	0.73	2/2412 (0.1%)
1	F	0.48	0/1789	0.73	2/2412 (0.1%)
1	G	0.47	0/1789	0.73	2/2412 (0.1%)
2	1	0.40	0/1577	0.63	2/2129 (0.1%)
2	2	0.40	0/1577	0.63	2/2129 (0.1%)
2	H	0.40	0/1577	0.63	2/2129 (0.1%)
2	I	0.40	0/1577	0.63	2/2129 (0.1%)
2	J	0.40	0/1577	0.63	2/2129 (0.1%)
2	K	0.40	0/1577	0.63	2/2129 (0.1%)
2	L	0.40	0/1577	0.63	2/2129 (0.1%)
2	M	0.40	0/1577	0.63	2/2129 (0.1%)
2	N	0.40	0/1577	0.63	2/2129 (0.1%)
2	V	0.40	0/1577	0.63	2/2129 (0.1%)
2	W	0.40	0/1577	0.63	2/2129 (0.1%)
2	X	0.40	0/1577	0.63	2/2129 (0.1%)
2	Y	0.40	0/1577	0.63	2/2129 (0.1%)
2	Z	0.40	0/1577	0.63	2/2129 (0.1%)
3	O	0.49	0/1793	0.69	0/2416
3	P	0.49	0/1793	0.70	0/2416
3	Q	0.49	0/1793	0.70	0/2416
3	R	0.49	0/1793	0.69	0/2416
3	S	0.49	0/1793	0.70	0/2416
3	T	0.49	0/1793	0.70	0/2416
3	U	0.49	0/1793	0.70	0/2416
4	a	0.38	0/1716	0.53	0/2319
4	b	0.38	0/1716	0.53	0/2319
4	c	0.38	0/1716	0.53	0/2319
4	d	0.38	0/1716	0.53	0/2319
4	e	0.38	0/1716	0.53	0/2319
4	f	0.38	0/1716	0.53	0/2319

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
4	g	0.38	0/1716	0.53	0/2319
All	All	0.44	0/59164	0.65	42/79835 (0.1%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	2
1	B	0	2
1	C	0	2
1	D	0	2
1	E	0	2
1	F	0	2
1	G	0	2
2	1	0	2
2	2	0	2
2	H	0	2
2	I	0	2
2	J	0	2
2	K	0	2
2	L	0	2
2	M	0	2
2	N	0	2
2	V	0	2
2	W	0	2
2	X	0	2
2	Y	0	2
2	Z	0	2
4	a	0	1
4	b	0	1
4	c	0	1
4	d	0	1
4	e	0	1
4	f	0	1
4	g	0	1
All	All	0	49

There are no bond length outliers.

The worst 5 of 42 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	M	21	THR	C-N-CA	6.89	138.92	121.70
2	N	21	THR	C-N-CA	6.89	138.91	121.70
2	V	21	THR	C-N-CA	6.88	138.91	121.70
2	I	21	THR	C-N-CA	6.88	138.90	121.70
2	Y	21	THR	C-N-CA	6.88	138.90	121.70

There are no chirality outliers.

5 of 49 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	207	LEU	Peptide
1	A	8	TYR	Peptide
1	B	207	LEU	Peptide
1	B	8	TYR	Peptide
1	C	8	TYR	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	1765	0	1792	14	0
1	B	1765	0	1792	14	0
1	C	1765	0	1792	13	0
1	D	1765	0	1792	13	0
1	E	1765	0	1792	9	0
1	F	1765	0	1792	11	0
1	G	1765	0	1792	11	0
2	1	1558	0	1609	17	0
2	2	1558	0	1609	19	0
2	H	1558	0	1609	25	0
2	I	1558	0	1609	25	0
2	J	1558	0	1609	22	0
2	K	1558	0	1609	22	0
2	L	1558	0	1609	22	0
2	M	1558	0	1609	21	0
2	N	1558	0	1609	19	0
2	V	1558	0	1609	17	0
2	W	1558	0	1609	15	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	X	1558	0	1609	18	0
2	Y	1558	0	1609	13	0
2	Z	1558	0	1609	14	0
3	O	1769	0	1800	36	0
3	P	1769	0	1800	40	0
3	Q	1769	0	1800	38	0
3	R	1769	0	1800	40	0
3	S	1769	0	1800	39	0
3	T	1769	0	1800	37	0
3	U	1769	0	1800	36	0
4	a	1692	0	1720	0	0
4	b	1692	0	1720	0	0
4	c	1692	0	1720	0	0
4	d	1692	0	1720	0	0
4	e	1692	0	1720	0	0
4	f	1692	0	1720	0	0
4	g	1692	0	1720	0	0
All	All	58394	0	59710	511	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.

The worst 5 of 511 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:T:156:THR:HA	3:U:86:ARG:HH12	1.50	0.77
3:R:156:THR:HA	3:S:86:ARG:HH12	1.50	0.76
3:S:156:THR:HA	3:T:86:ARG:HH12	1.50	0.76
3:O:86:ARG:HH12	3:U:156:THR:HA	1.51	0.76
3:O:156:THR:HA	3:P:86:ARG:HH12	1.50	0.75

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	225/227 (99%)	212 (94%)	12 (5%)	1 (0%)	34	67
1	B	225/227 (99%)	211 (94%)	13 (6%)	1 (0%)	34	67
1	C	225/227 (99%)	213 (95%)	11 (5%)	1 (0%)	34	67
1	D	225/227 (99%)	212 (94%)	12 (5%)	1 (0%)	34	67
1	E	225/227 (99%)	213 (95%)	11 (5%)	1 (0%)	34	67
1	F	225/227 (99%)	213 (95%)	11 (5%)	1 (0%)	34	67
1	G	225/227 (99%)	212 (94%)	12 (5%)	1 (0%)	34	67
2	1	201/203 (99%)	195 (97%)	5 (2%)	1 (0%)	29	61
2	2	201/203 (99%)	195 (97%)	5 (2%)	1 (0%)	29	61
2	H	201/203 (99%)	195 (97%)	5 (2%)	1 (0%)	29	61
2	I	201/203 (99%)	195 (97%)	5 (2%)	1 (0%)	29	61
2	J	201/203 (99%)	195 (97%)	5 (2%)	1 (0%)	29	61
2	K	201/203 (99%)	195 (97%)	5 (2%)	1 (0%)	29	61
2	L	201/203 (99%)	195 (97%)	5 (2%)	1 (0%)	29	61
2	M	201/203 (99%)	195 (97%)	5 (2%)	1 (0%)	29	61
2	N	201/203 (99%)	195 (97%)	5 (2%)	1 (0%)	29	61
2	V	201/203 (99%)	195 (97%)	5 (2%)	1 (0%)	29	61
2	W	201/203 (99%)	195 (97%)	5 (2%)	1 (0%)	29	61
2	X	201/203 (99%)	195 (97%)	5 (2%)	1 (0%)	29	61
2	Y	201/203 (99%)	195 (97%)	5 (2%)	1 (0%)	29	61
2	Z	201/203 (99%)	195 (97%)	5 (2%)	1 (0%)	29	61
3	O	225/227 (99%)	208 (92%)	17 (8%)	0	100	100
3	P	225/227 (99%)	208 (92%)	17 (8%)	0	100	100
3	Q	225/227 (99%)	208 (92%)	17 (8%)	0	100	100
3	R	225/227 (99%)	208 (92%)	17 (8%)	0	100	100
3	S	225/227 (99%)	208 (92%)	17 (8%)	0	100	100
3	T	225/227 (99%)	208 (92%)	17 (8%)	0	100	100
3	U	225/227 (99%)	208 (92%)	17 (8%)	0	100	100
4	a	215/229 (94%)	207 (96%)	8 (4%)	0	100	100
4	b	215/229 (94%)	207 (96%)	8 (4%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
4	c	215/229 (94%)	207 (96%)	8 (4%)	0	100	100
4	d	215/229 (94%)	207 (96%)	8 (4%)	0	100	100
4	e	215/229 (94%)	207 (96%)	8 (4%)	0	100	100
4	f	215/229 (94%)	207 (96%)	8 (4%)	0	100	100
4	g	215/229 (94%)	207 (96%)	8 (4%)	0	100	100
All	All	7469/7623 (98%)	7121 (95%)	327 (4%)	21 (0%)	44	72

5 of 21 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	208	LYS
1	B	208	LYS
1	C	208	LYS
1	D	208	LYS
1	E	208	LYS

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	187/187 (100%)	185 (99%)	2 (1%)	73	86
1	B	187/187 (100%)	185 (99%)	2 (1%)	73	86
1	C	187/187 (100%)	185 (99%)	2 (1%)	73	86
1	D	187/187 (100%)	185 (99%)	2 (1%)	73	86
1	E	187/187 (100%)	185 (99%)	2 (1%)	73	86
1	F	187/187 (100%)	185 (99%)	2 (1%)	73	86
1	G	187/187 (100%)	185 (99%)	2 (1%)	73	86
2	1	170/170 (100%)	169 (99%)	1 (1%)	86	94
2	2	170/170 (100%)	169 (99%)	1 (1%)	86	94
2	H	170/170 (100%)	169 (99%)	1 (1%)	86	94
2	I	170/170 (100%)	169 (99%)	1 (1%)	86	94

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	J	170/170 (100%)	169 (99%)	1 (1%)	86	94
2	K	170/170 (100%)	169 (99%)	1 (1%)	86	94
2	L	170/170 (100%)	169 (99%)	1 (1%)	86	94
2	M	170/170 (100%)	169 (99%)	1 (1%)	86	94
2	N	170/170 (100%)	169 (99%)	1 (1%)	86	94
2	V	170/170 (100%)	169 (99%)	1 (1%)	86	94
2	W	170/170 (100%)	169 (99%)	1 (1%)	86	94
2	X	170/170 (100%)	169 (99%)	1 (1%)	86	94
2	Y	170/170 (100%)	169 (99%)	1 (1%)	86	94
2	Z	170/170 (100%)	169 (99%)	1 (1%)	86	94
3	O	188/188 (100%)	186 (99%)	2 (1%)	73	86
3	P	188/188 (100%)	186 (99%)	2 (1%)	73	86
3	Q	188/188 (100%)	186 (99%)	2 (1%)	73	86
3	R	188/188 (100%)	186 (99%)	2 (1%)	73	86
3	S	188/188 (100%)	186 (99%)	2 (1%)	73	86
3	T	188/188 (100%)	186 (99%)	2 (1%)	73	86
3	U	188/188 (100%)	186 (99%)	2 (1%)	73	86
4	a	179/187 (96%)	178 (99%)	1 (1%)	86	94
4	b	179/187 (96%)	178 (99%)	1 (1%)	86	94
4	c	179/187 (96%)	178 (99%)	1 (1%)	86	94
4	d	179/187 (96%)	178 (99%)	1 (1%)	86	94
4	e	179/187 (96%)	178 (99%)	1 (1%)	86	94
4	f	179/187 (96%)	178 (99%)	1 (1%)	86	94
4	g	179/187 (96%)	178 (99%)	1 (1%)	86	94
All	All	6258/6314 (99%)	6209 (99%)	49 (1%)	82	91

5 of 49 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	O	40	MET
3	R	222	ARG
3	O	222	ARG
3	Q	40	MET
3	S	222	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 46 such sidechains are listed below:

Mol	Chain	Res	Type
3	S	219	ASN
4	a	185	GLN
3	T	62	ASN
3	U	68	GLN
4	b	72	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no monosaccharides in this entry.

5.6 Ligand geometry ⓘ

There are no ligands in this entry.

5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

6 Map visualisation ⓘ

This section contains visualisations of the EMDB entry EMD-20879. These allow visual inspection of the internal detail of the map and identification of artifacts.

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

6.1 Orthogonal projections ⓘ
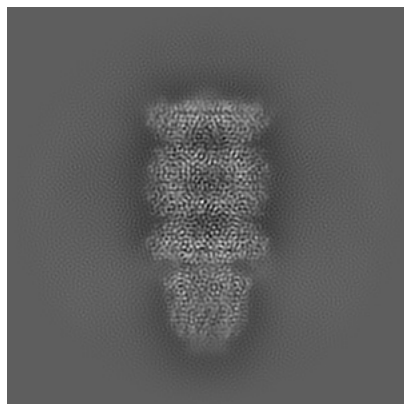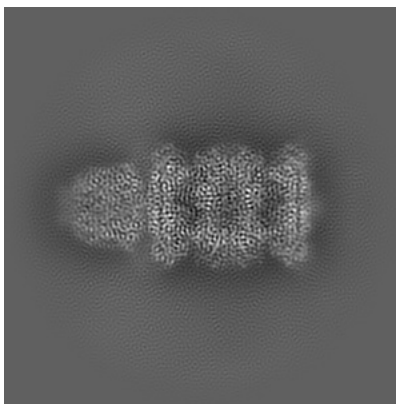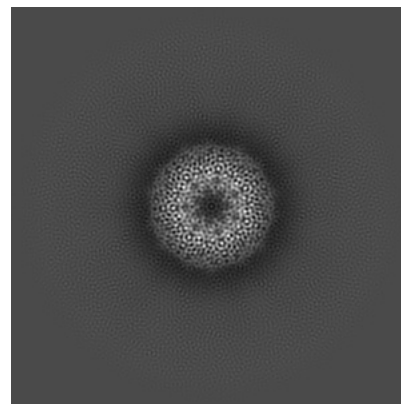
6.1.1 Primary map

X   Y   Z

6.1.2 Raw map

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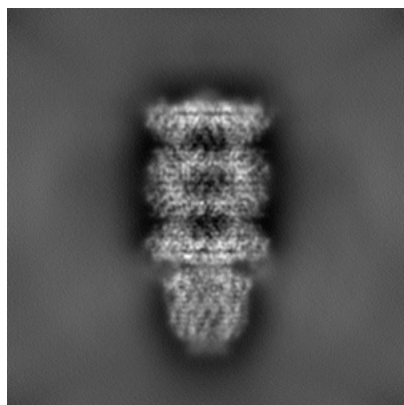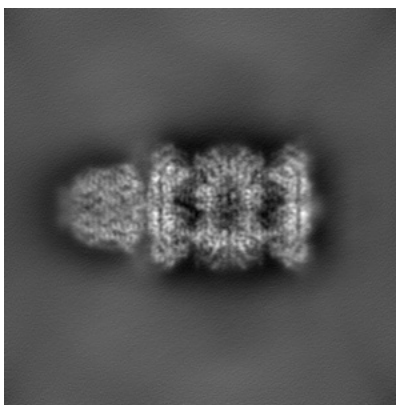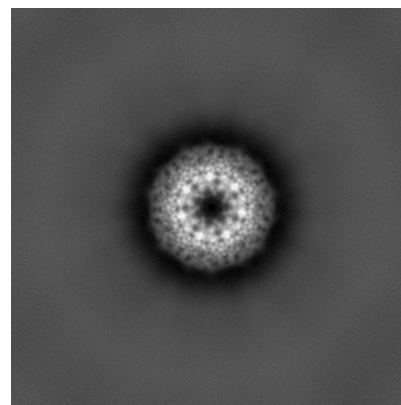
The images above show the map projected in three orthogonal directions.

6.2 Central slices ⓘ
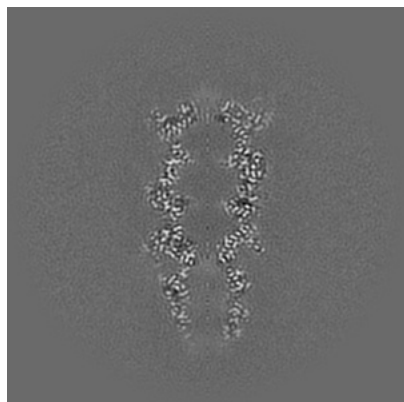
6.2.1 Primary map
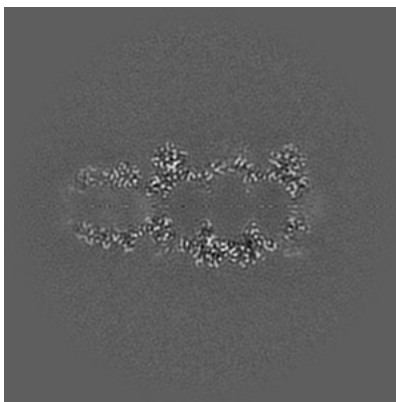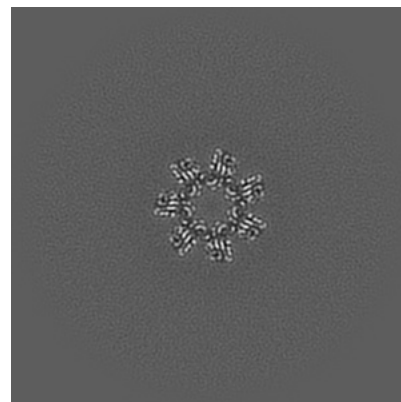
X Index: 160	Y Index: 160	Z Index: 160

6.2.2 Raw map
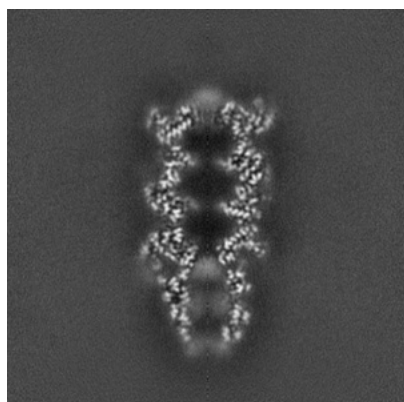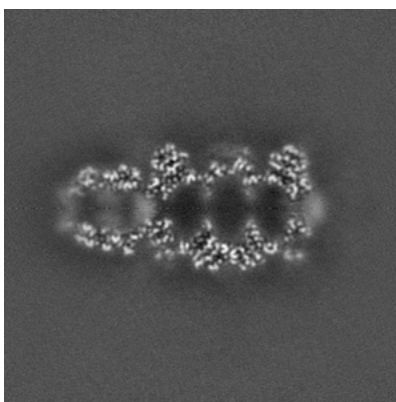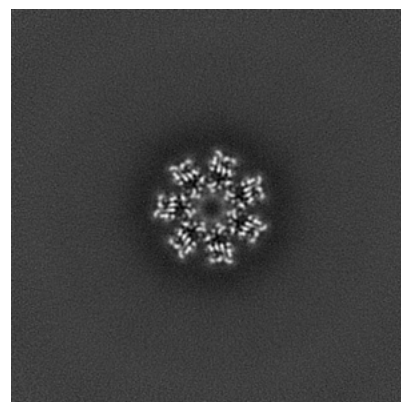
X Index: 160	Y Index: 160	Z Index: 160

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

6.3   Largest variance slices ⓘ

6.3.1   Primary map
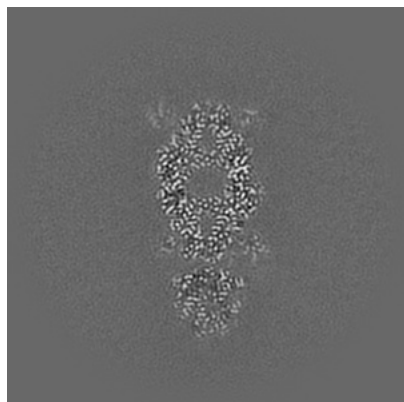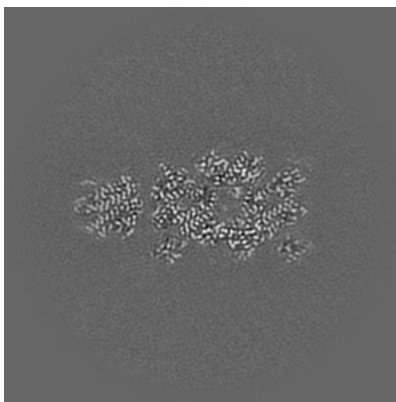
X Index: 139	Y Index: 183	Z Index: 131
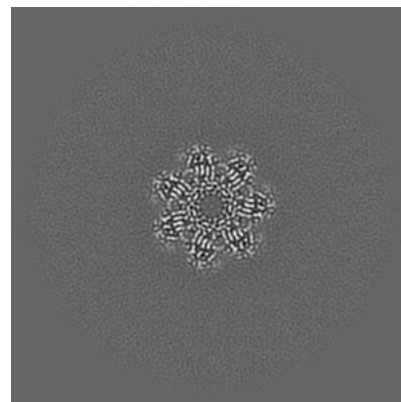
6.3.2   Raw map
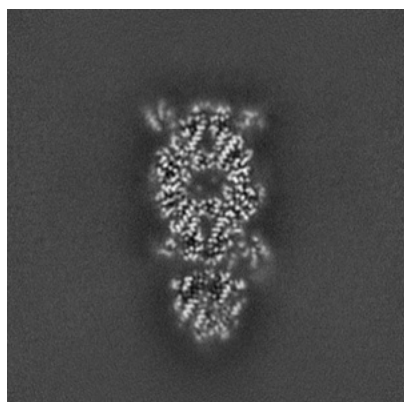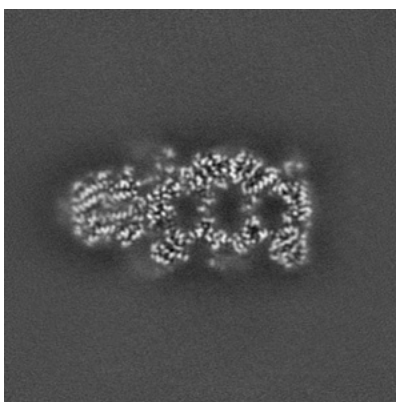
X Index: 139	Y Index: 176	Z Index: 132
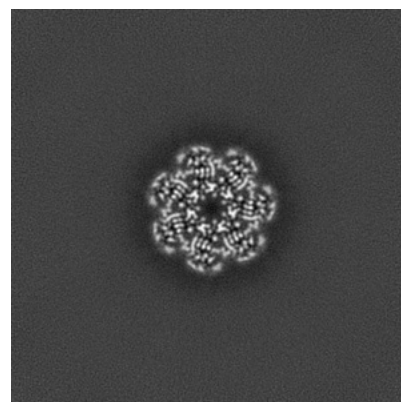
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color) ⓘ

6.4.1 Primary map
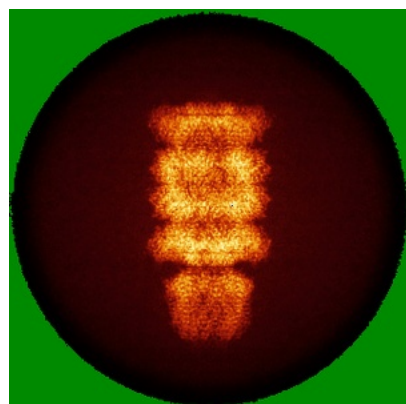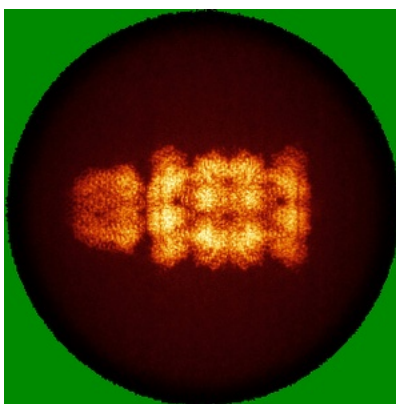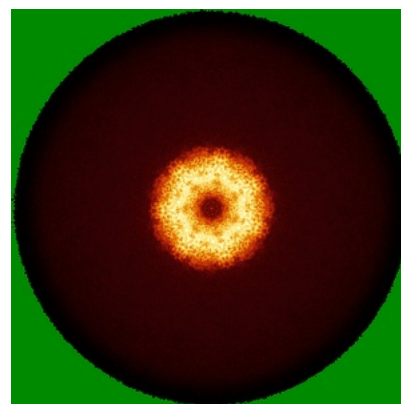
X   Y   Z

6.4.2 Raw map

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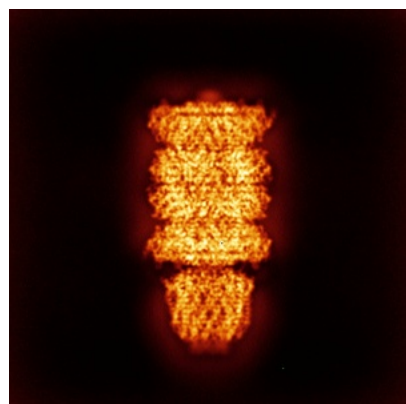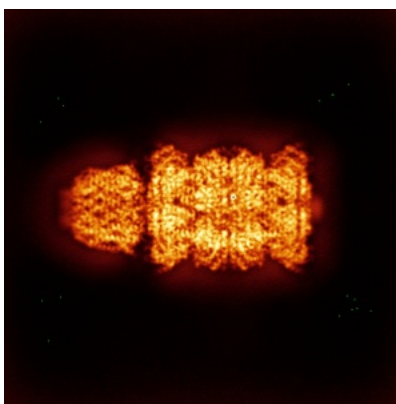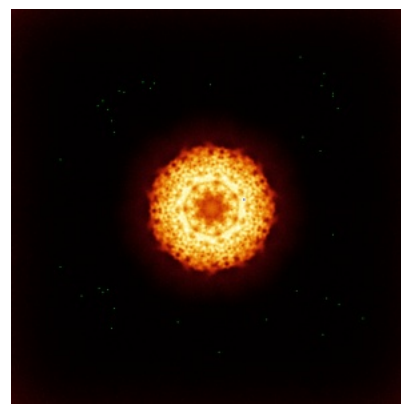
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views (i)

6.5.1 Primary map

X   Y   Z
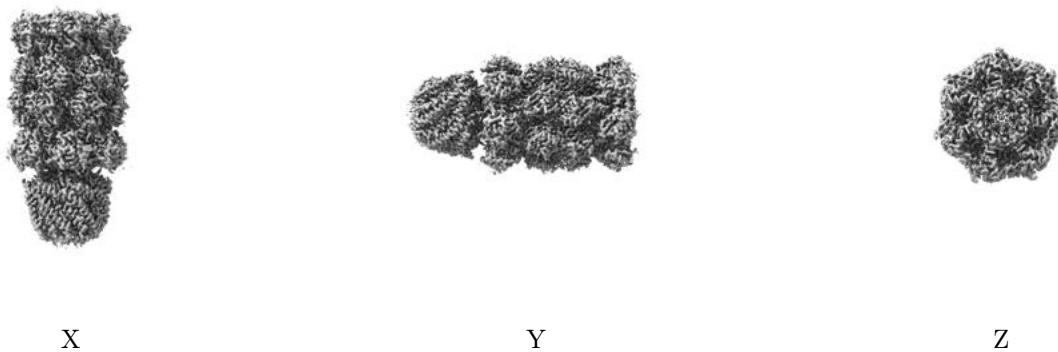
The images above show the 3D surface view of the map at the recommended contour level 0.655. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map

X   Y   Z
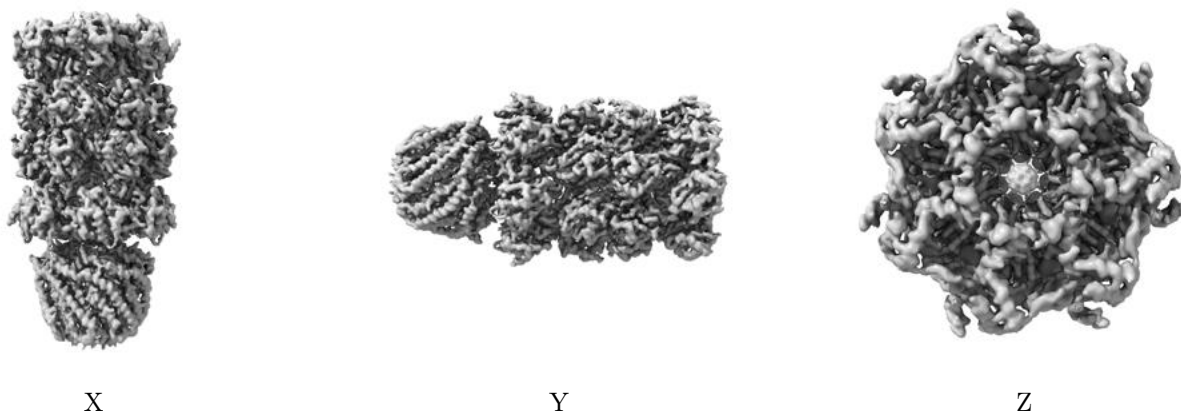
These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

6.6 Mask visualisation (i)

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

7 Map analysis ⓘ

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

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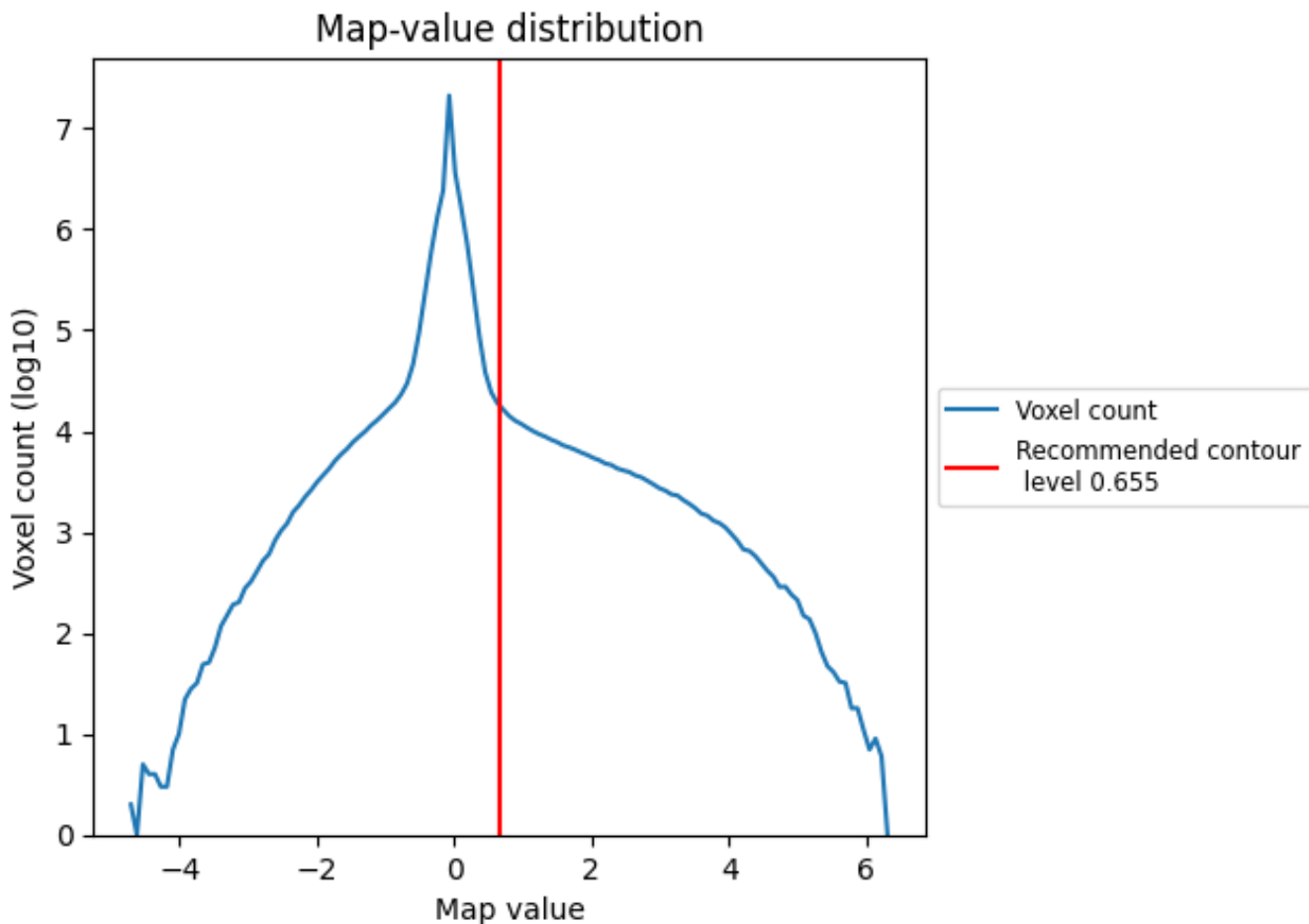
The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

7.2   Volume estimate ⓘ
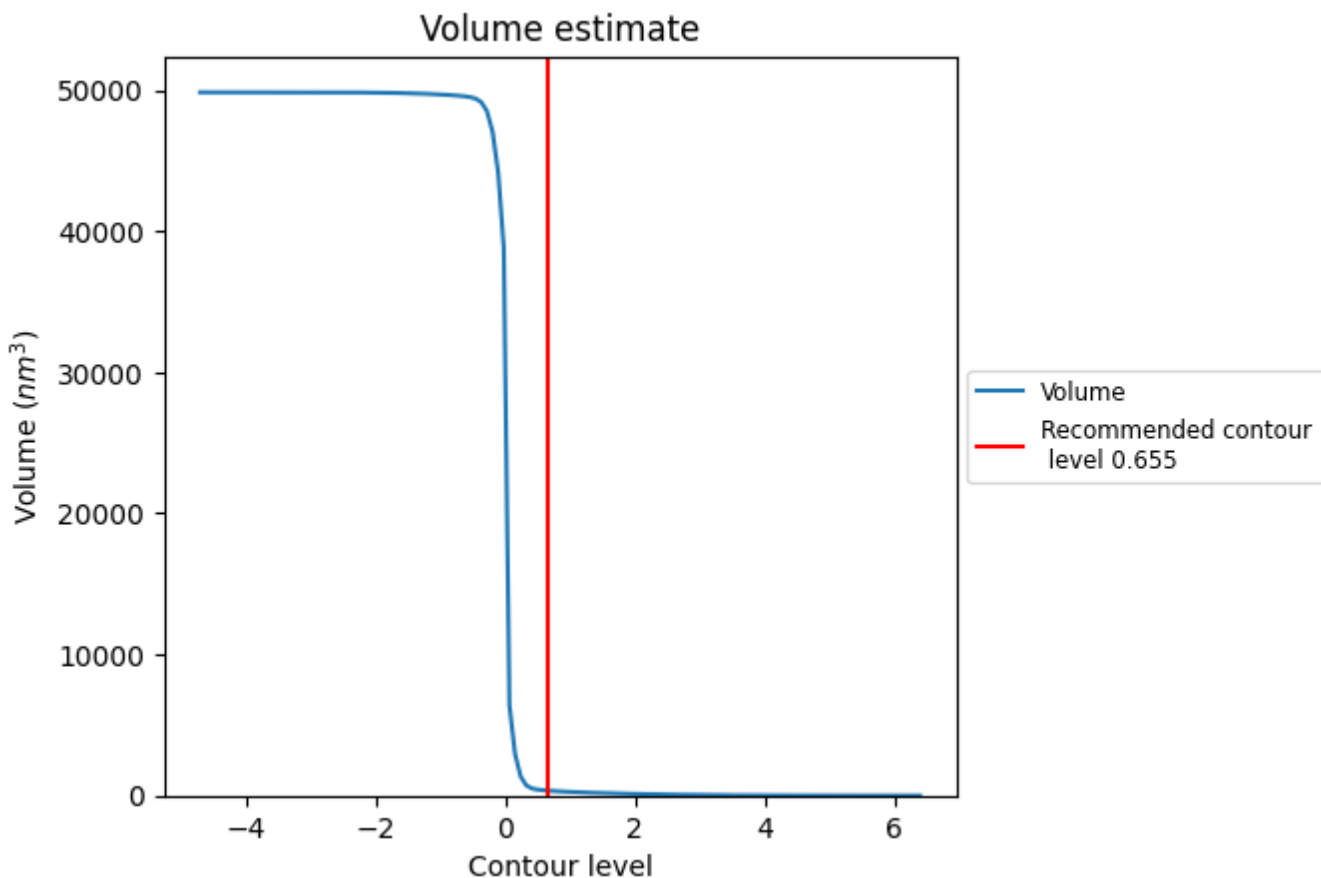
The volume at the recommended contour level is 350 nm^3; this corresponds to an approximate mass of 316 kDa.

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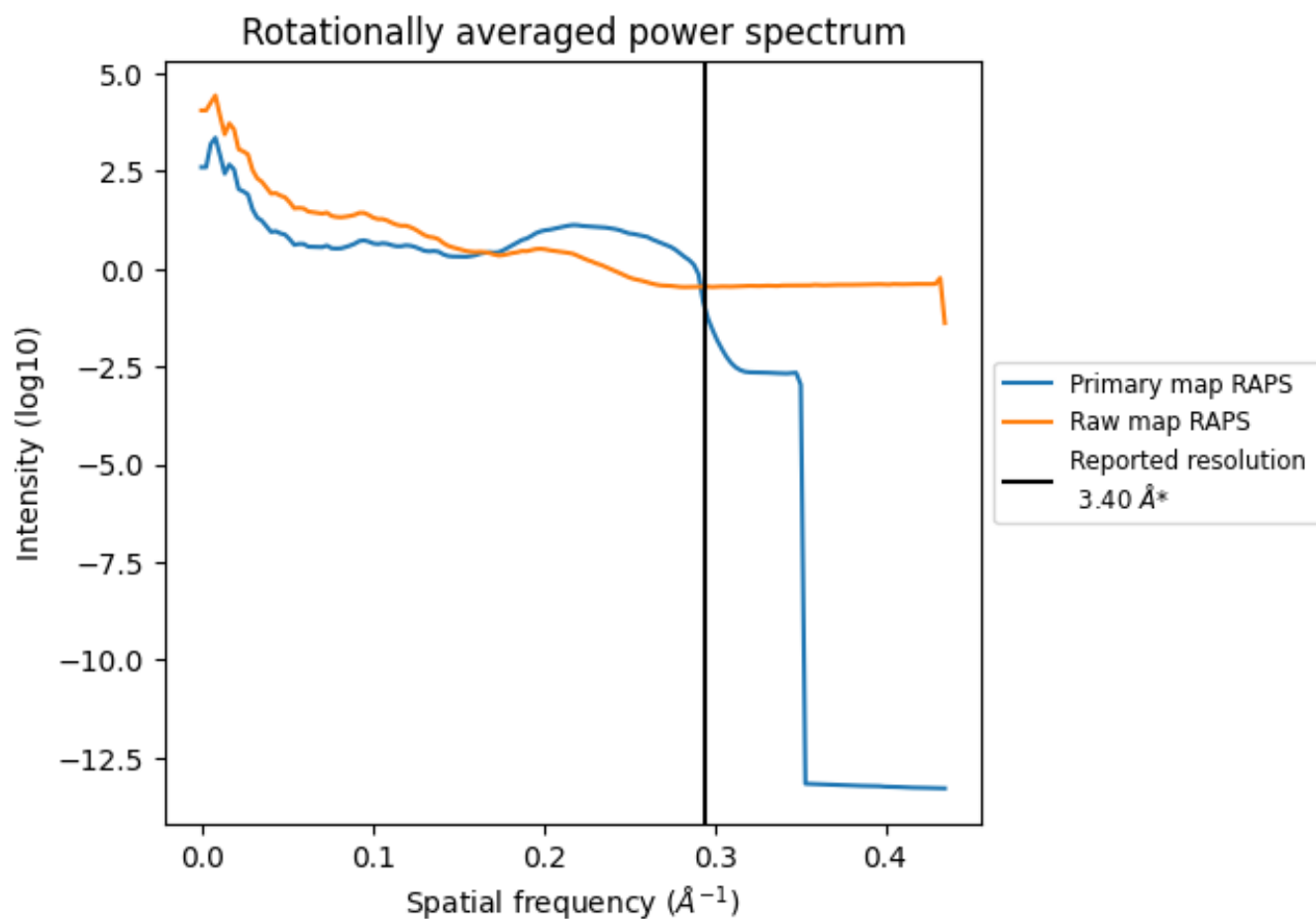
*Reported resolution corresponds to spatial frequency of 0.294 Å^{-1}

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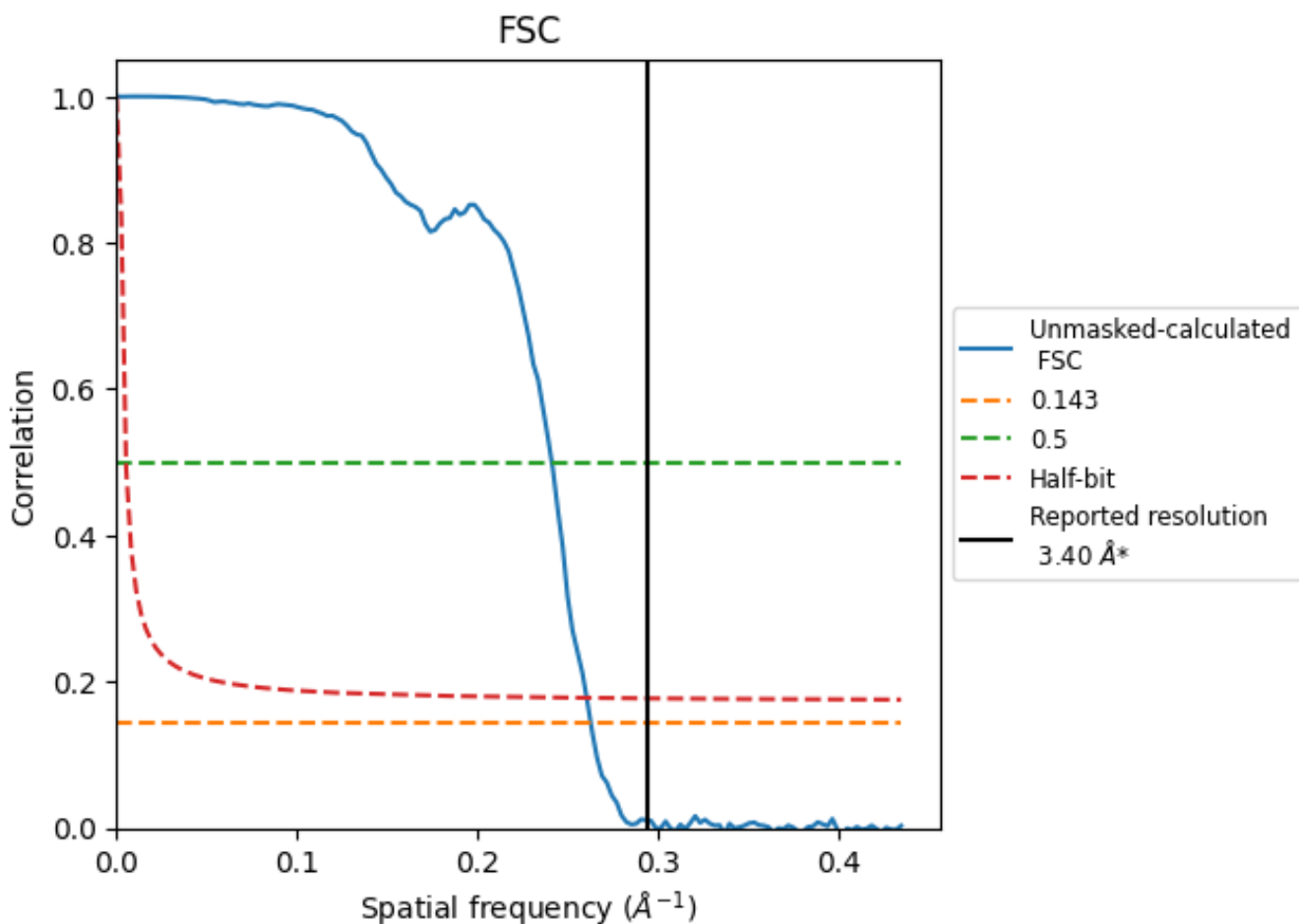
*Reported resolution corresponds to spatial frequency of 0.294 Å^{-1}

8.2   Resolution estimates ⓘ

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.40	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	3.81	4.14	3.84

*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 3.81 differs from the reported value 3.4 by more than 10 %

9 Map-model fit ⓘ

This section contains information regarding the fit between EMDB map EMD-20879 and PDB model 6UTH. Per-residue inclusion information can be found in section 3 on page 10.

9.1 Map-model overlay ⓘ

| X | Y | Z |
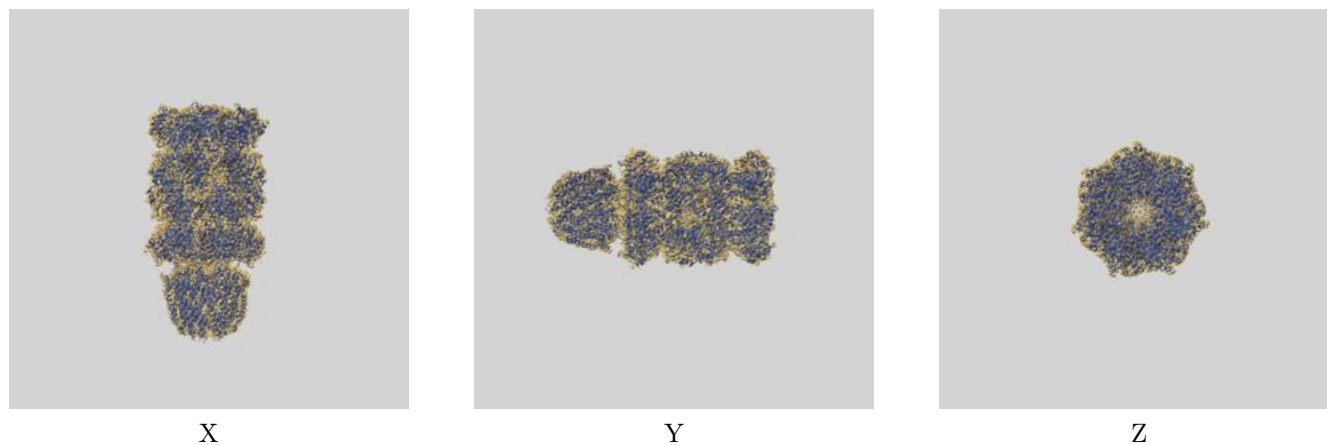
The images above show the 3D surface view of the map at the recommended contour level 0.655 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2　Q-score mapped to coordinate model ⓘ
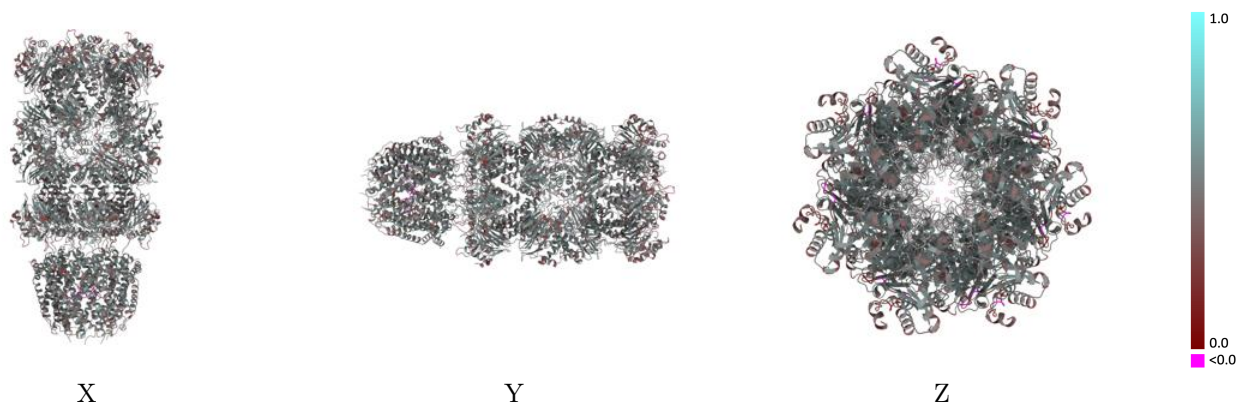
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions at which atoms can be resolved. Low Q-score values may therefore be expected for many entries.

9.3　Atom inclusion mapped to coordinate model ⓘ
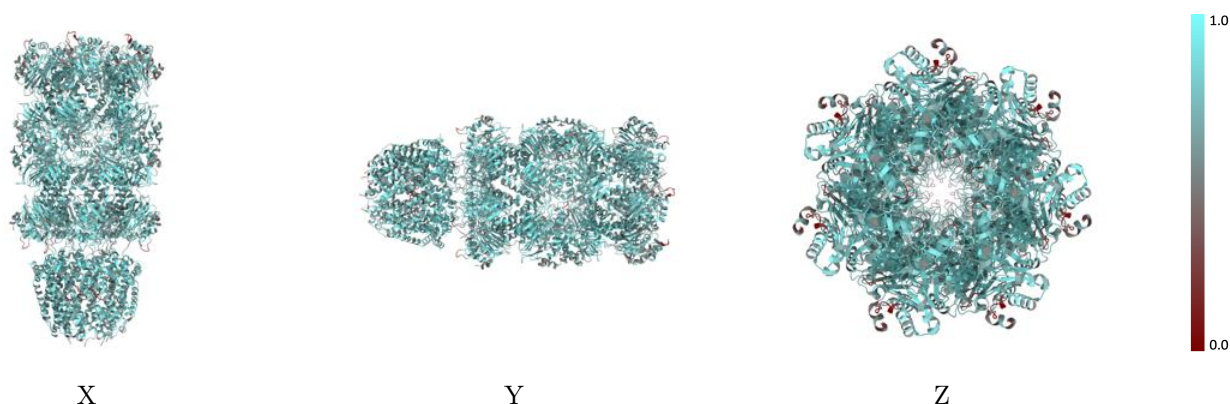
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.655).

9.4   Atom inclusion ⓘ
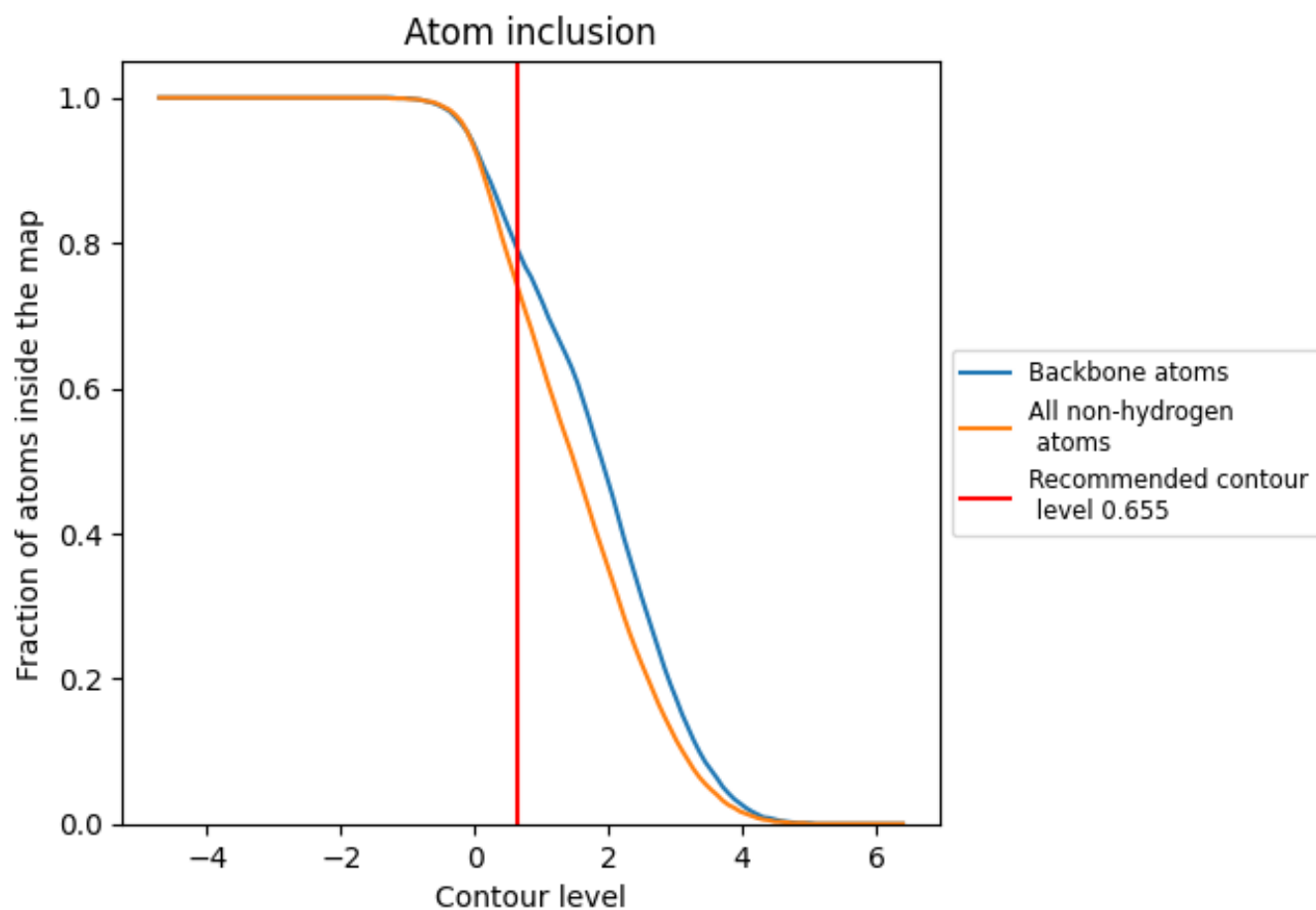
At the recommended contour level, 79% of all backbone atoms, 74% of all non-hydrogen atoms, are inside the map.

9.5　Map-model fit summary (i)

The table lists the average atom inclusion at the recommended contour level (0.655) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7360	0.4590
1	0.7710	0.4780
2	0.7710	0.4790
A	0.6760	0.4330
B	0.6730	0.4350
C	0.6740	0.4350
D	0.6800	0.4330
E	0.6770	0.4340
F	0.6760	0.4340
G	0.6750	0.4330
H	0.7750	0.4720
I	0.7710	0.4680
J	0.7880	0.4770
K	0.7810	0.4750
L	0.7810	0.4790
M	0.7770	0.4770
N	0.7750	0.4780
O	0.7470	0.4620
P	0.7450	0.4610
Q	0.7470	0.4570
R	0.7410	0.4580
S	0.7480	0.4600
T	0.7470	0.4620
U	0.7460	0.4590
V	0.7750	0.4790
W	0.7730	0.4790
X	0.7720	0.4780
Y	0.7750	0.4810
Z	0.7770	0.4800
a	0.7180	0.4520
b	0.7110	0.4470
c	0.7170	0.4510
d	0.7130	0.4490
e	0.7140	0.4510
f	0.7150	0.4480
g	0.7140	0.4460

1.0

0.0
<0.0