Full wwPDB EM Validation Report (i)

Nov 6, 2022 – 09:33 AM EST

PDB ID	:	8DK1
EMDB ID	:	EMD-27480
Title	:	CryoEM structure of JetABC (head construct) from Pseudomonas aeruginosa PA14
Authors	:	Deep, A.; Gu, Y.; Gao, Y.; Ego, K.; Herzik, M.; Zhou, H.; Corbett, K.
Deposited on	:	2022-07-01
Resolution	:	2.95 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*
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:

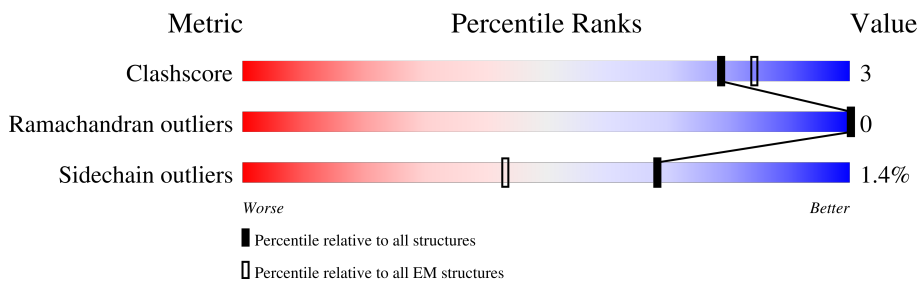|		
EMDB validation analysis	:	0.0.1.dev43
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.9
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.31.2

1　Overall quality at a glance ⓘ

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

The reported resolution of this entry is 2.95 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		3
Ramachandran outliers		0
Sidechain outliers		1.4%

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	517	62% · 5% 32%
1	B	517	61% 6% 32%
2	C	633	75% 5% 20%
2	D	633	75% · 5% 20%
3	E	249	38% · 59% 11% 29%
3	F	249	69% · 6% 24%
3	G	249	38% 61% 9% 29%
3	H	249	69% · 7% 24%

2 Entry composition ⓘ

There are 3 unique types of molecules in this entry. The entry contains 19500 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 JetA.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	349	Total 2796	C 1727	N 550	O 512	S 7	0	0
1	B	349	Total 2796	C 1727	N 550	O 512	S 7	0	0

There are 36 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-17	MET	-	initiating methionine	UNP A0A0H2ZJP9
A	-16	LYS	-	expression tag	UNP A0A0H2ZJP9
A	-15	SER	-	expression tag	UNP A0A0H2ZJP9
A	-14	SER	-	expression tag	UNP A0A0H2ZJP9
A	-13	HIS	-	expression tag	UNP A0A0H2ZJP9
A	-12	HIS	-	expression tag	UNP A0A0H2ZJP9
A	-11	HIS	-	expression tag	UNP A0A0H2ZJP9
A	-10	HIS	-	expression tag	UNP A0A0H2ZJP9
A	-9	HIS	-	expression tag	UNP A0A0H2ZJP9
A	-8	HIS	-	expression tag	UNP A0A0H2ZJP9
A	-7	GLU	-	expression tag	UNP A0A0H2ZJP9
A	-6	ASN	-	expression tag	UNP A0A0H2ZJP9
A	-4	TYR	TRP	conflict	UNP A0A0H2ZJP9
A	-3	PHE	LYS	conflict	UNP A0A0H2ZJP9
A	-2	GLN	VAL	conflict	UNP A0A0H2ZJP9
A	-1	SER	ALA	conflict	UNP A0A0H2ZJP9
A	0	ASN	ALA	conflict	UNP A0A0H2ZJP9
A	1	ALA	MET	conflict	UNP A0A0H2ZJP9
B	-17	MET	-	initiating methionine	UNP A0A0H2ZJP9
B	-16	LYS	-	expression tag	UNP A0A0H2ZJP9
B	-15	SER	-	expression tag	UNP A0A0H2ZJP9
B	-14	SER	-	expression tag	UNP A0A0H2ZJP9
B	-13	HIS	-	expression tag	UNP A0A0H2ZJP9
B	-12	HIS	-	expression tag	UNP A0A0H2ZJP9
B	-11	HIS	-	expression tag	UNP A0A0H2ZJP9
B	-10	HIS	-	expression tag	UNP A0A0H2ZJP9

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Chain	Residue	Modelled	Actual	Comment	Reference
B	-9	HIS	-	expression tag	UNP A0A0H2ZJP9
B	-8	HIS	-	expression tag	UNP A0A0H2ZJP9
B	-7	GLU	-	expression tag	UNP A0A0H2ZJP9
B	-6	ASN	-	expression tag	UNP A0A0H2ZJP9
B	-4	TYR	TRP	conflict	UNP A0A0H2ZJP9
B	-3	PHE	LYS	conflict	UNP A0A0H2ZJP9
B	-2	GLN	VAL	conflict	UNP A0A0H2ZJP9
B	-1	SER	ALA	conflict	UNP A0A0H2ZJP9
B	0	ASN	ALA	conflict	UNP A0A0H2ZJP9
B	1	ALA	MET	conflict	UNP A0A0H2ZJP9

- Molecule 2 is a protein called JetC.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	C	509	Total 4035	C 2535	N 732	O 757	S 11	0	0
2	D	509	Total 4035	C 2535	N 732	O 757	S 11	0	0

There are 62 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	-17	MET	-	initiating methionine	UNP A0A8G4Z850
C	-16	LYS	-	expression tag	UNP A0A8G4Z850
C	-15	SER	-	expression tag	UNP A0A8G4Z850
C	-14	SER	-	expression tag	UNP A0A8G4Z850
C	-13	HIS	-	expression tag	UNP A0A8G4Z850
C	-12	HIS	-	expression tag	UNP A0A8G4Z850
C	-11	HIS	-	expression tag	UNP A0A8G4Z850
C	-10	HIS	-	expression tag	UNP A0A8G4Z850
C	-9	HIS	-	expression tag	UNP A0A8G4Z850
C	-8	HIS	-	expression tag	UNP A0A8G4Z850
C	-7	GLU	-	expression tag	UNP A0A8G4Z850
C	-6	ASN	-	expression tag	UNP A0A8G4Z850
C	-5	LEU	-	expression tag	UNP A0A8G4Z850
C	-4	TYR	-	expression tag	UNP A0A8G4Z850
C	-3	PHE	-	expression tag	UNP A0A8G4Z850
C	-2	GLN	-	expression tag	UNP A0A8G4Z850
C	-1	SER	-	expression tag	UNP A0A8G4Z850
C	0	ASN	-	expression tag	UNP A0A8G4Z850
C	1	ALA	-	expression tag	UNP A0A8G4Z850
C	771	SER	-	linker	UNP A0A8G4Z850

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Chain	Residue	Modelled	Actual	Comment	Reference
C	772	GLY	-	linker	UNP A0A8G4Z850
C	773	SER	-	linker	UNP A0A8G4Z850
C	774	SER	-	linker	UNP A0A8G4Z850
C	775	GLY	-	linker	UNP A0A8G4Z850
C	776	SER	-	linker	UNP A0A8G4Z850
C	777	SER	-	linker	UNP A0A8G4Z850
C	778	GLY	-	linker	UNP A0A8G4Z850
C	779	SER	-	linker	UNP A0A8G4Z850
C	780	SER	-	linker	UNP A0A8G4Z850
C	783	ALA	LEU	engineered mutation	UNP A0A8G4Z850
C	1022	GLN	GLU	engineered mutation	UNP A0A8G4Z850
D	-17	MET	-	initiating methionine	UNP A0A8G4Z850
D	-16	LYS	-	expression tag	UNP A0A8G4Z850
D	-15	SER	-	expression tag	UNP A0A8G4Z850
D	-14	SER	-	expression tag	UNP A0A8G4Z850
D	-13	HIS	-	expression tag	UNP A0A8G4Z850
D	-12	HIS	-	expression tag	UNP A0A8G4Z850
D	-11	HIS	-	expression tag	UNP A0A8G4Z850
D	-10	HIS	-	expression tag	UNP A0A8G4Z850
D	-9	HIS	-	expression tag	UNP A0A8G4Z850
D	-8	HIS	-	expression tag	UNP A0A8G4Z850
D	-7	GLU	-	expression tag	UNP A0A8G4Z850
D	-6	ASN	-	expression tag	UNP A0A8G4Z850
D	-5	LEU	-	expression tag	UNP A0A8G4Z850
D	-4	TYR	-	expression tag	UNP A0A8G4Z850
D	-3	PHE	-	expression tag	UNP A0A8G4Z850
D	-2	GLN	-	expression tag	UNP A0A8G4Z850
D	-1	SER	-	expression tag	UNP A0A8G4Z850
D	0	ASN	-	expression tag	UNP A0A8G4Z850
D	1	ALA	-	expression tag	UNP A0A8G4Z850
D	771	SER	-	linker	UNP A0A8G4Z850
D	772	GLY	-	linker	UNP A0A8G4Z850
D	773	SER	-	linker	UNP A0A8G4Z850
D	774	SER	-	linker	UNP A0A8G4Z850
D	775	GLY	-	linker	UNP A0A8G4Z850
D	776	SER	-	linker	UNP A0A8G4Z850
D	777	SER	-	linker	UNP A0A8G4Z850
D	778	GLY	-	linker	UNP A0A8G4Z850
D	779	SER	-	linker	UNP A0A8G4Z850
D	780	SER	-	linker	UNP A0A8G4Z850
D	783	ALA	LEU	engineered mutation	UNP A0A8G4Z850
D	1022	GLN	GLU	engineered mutation	UNP A0A8G4Z850

- Molecule 3 is a protein called JetB.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	E	176	Total	C	N	O	S	0	0
			1413	894	257	260	2		
3	F	189	Total	C	N	O	S	0	0
			1506	949	272	283	2		
3	G	176	Total	C	N	O	S	0	0
			1413	894	257	260	2		
3	H	189	Total	C	N	O	S	0	0
			1506	949	272	283	2		

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: JetA

Chain A:

- Molecule 1: JetA

Chain B:

- Molecule 2: JetC

Chain C:

• Molecule 2: JetC

Chain D:

• Molecule 3: JetB

Chain E:

• Molecule 3: JetB

Chain F:

MET ALA GLY ILE PHE ASP ARG ILE ALA GLY ALA SER GLY ALA ASP GLU THR GLU LEU THR ALA GLU PRO MET ALA LEU ASP ASP GLY MET ASP GLY GLU GLN PRO ALA MET SER ALA ASN ILE GLN VAL ASP GLU ARG ARG T48 G111 E112 V113 A114 E115 Q116 R125 R126 Y147

V162 I166 E182 R183 I186 G195 S200 D206 R211 N219 P220 G236 ALA VAL THR PRO ALA ALA GLY GLY GLU GLU ASP GLU ALA

• Molecule 3: JetB

Chain G:

38%

61% 9% 29%

MET ALA GLY ILE PHE ASP ARG ILE ALA GLY ALA SER GLY ALA ASP GLU THR GLU LEU THR ALA GLU PRO MET ALA LEU ASP ASP GLY MET ASP GLY GLU GLN PRO ALA MET SER ASN ILE GLN VAL ASP GLU ARG ARG T48 R101 V106 Q110 GLY GLU VAL ALA GLU GLN

ASP ASP TRP S120 R125 R128 L129 N130 L131 E132 Q133 S134 L135 L136 I137 A138 I139 L140 R141 Q142 H143 F144 I145 A146 Y147 E148 Q149 E150 S151 GLY THR GLY ALA S156 Q157 A158 L159 V160 A161 V162 D163 E164 L165 I166 P167 Q168 L169 Q170 V171 Y172 L173 G174 E175 L176 G177 S178 E179 A180

K181 E182 R183 N184 R185 I186 I187 T188 L189 L190 D191 Q192 L193 K194 G195 H196 G197 L198 V199 S200 A201 L202 D203 A204 H205 D206 R207 V208 I209 I210 I214 L217 A218 N219 P220 E221 N222 L223 Q224 A225 L226 V227 Y228 W229 L230 R231 E232 Q233 V234 E235 G236 ALA VAL THR PRO ALA ALA GLY

GLY GLU GLU ASP GLU ALA

• Molecule 3: JetB

Chain H:

69% 7% 24%

MET ALA GLY ILE PHE ASP ARG ILE ALA GLY ALA SER GLY ALA ASP GLU THR GLU LEU THR ALA GLU PRO MET ALA LEU ASP ASP GLY MET ASP GLY GLU GLN PRO ALA MET SER ALA ASN ILE GLN VAL ASP GLU ARG ARG T48 Q110 G111 E112 V113 A114 E115 Q116 D117 R126 Q127

R128 Y147 V162 I166 E182 R183 I186 G195 S200 D206 R211 N219 P220 G236 ALA VAL THR PRO ALA ALA GLY GLY GLU GLU ASP GLU ALA

4 Experimental information ⓘ

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C2	Depositor
Number of particles used	130904	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose $(e^-/\text{Å}^2)$	54.1	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	165000	Depositor
Image detector	GATAN K2 QUANTUM (4k x 4k)	Depositor
Maximum map value	0.536	Depositor
Minimum map value	-0.184	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.015	Depositor
Recommended contour level	0.11	Depositor
Map size (Å)	322.56, 322.56, 322.56	wwPDB
Map dimensions	384, 384, 384	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.84, 0.84, 0.84	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	0.24	0/2834	0.52	0/3822
1	B	0.24	0/2834	0.52	0/3822
2	C	0.24	0/4103	0.49	0/5536
2	D	0.24	0/4103	0.49	0/5536
3	E	0.23	0/1431	0.48	0/1938
3	F	0.25	0/1528	0.48	0/2074
3	G	0.23	0/1431	0.47	0/1938
3	H	0.25	0/1528	0.48	0/2074
All	All	0.24	0/19792	0.49	0/26740

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	2796	0	2821	15	0
1	B	2796	0	2821	18	0
2	C	4035	0	4037	15	0
2	D	4035	0	4037	16	0
3	E	1413	0	1459	15	0
3	F	1506	0	1534	10	0
3	G	1413	0	1459	13	0
3	H	1506	0	1534	9	0

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

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
All	All	19500	0	19702	109	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 3.

All (109) 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)
2:C:53:VAL:HG21	2:C:1049:ILE:HD11	1.71	0.71
1:B:369:ILE:HG22	1:B:370:GLU:HG3	1.80	0.64
3:E:200:SER:HB2	3:E:209:ILE:HB	1.79	0.64
3:H:110:GLN:HA	3:H:116:GLN:HE22	1.62	0.63
3:G:200:SER:HB2	3:G:209:ILE:HB	1.81	0.63
3:G:138:ALA:HB2	3:G:226:LEU:HD11	1.81	0.62
3:G:170:GLN:NE2	3:G:182:GLU:OE2	2.34	0.61
3:H:166:ILE:HG12	3:H:186:ILE:HG13	1.84	0.60
3:F:126:ARG:NH1	3:F:195:GLY:O	2.34	0.60
3:F:166:ILE:HG12	3:F:186:ILE:HG13	1.83	0.60
3:G:161:ALA:HB3	3:G:164:GLU:HG3	1.83	0.60
3:E:170:GLN:NE2	3:E:182:GLU:OE2	2.34	0.60
2:C:239:ALA:HB1	2:C:939:LYS:HE3	1.84	0.60
3:E:161:ALA:HB3	3:E:164:GLU:HG3	1.83	0.60
3:H:126:ARG:NH1	3:H:195:GLY:O	2.35	0.60
2:D:239:ALA:HB1	2:D:939:LYS:HE3	1.83	0.59
2:D:53:VAL:HG21	2:D:1049:ILE:HD11	1.85	0.58
3:H:200:SER:OG	3:H:211:ARG:NH2	2.37	0.58
3:E:138:ALA:HB2	3:E:226:LEU:HD11	1.85	0.57
3:F:200:SER:OG	3:F:211:ARG:NH2	2.37	0.57
3:F:111:GLY:H	3:F:116:GLN:HE22	1.53	0.55
2:D:1057:LEU:HD23	2:D:1057:LEU:H	1.72	0.55
3:G:172:TYR:O	3:G:233:GLN:NE2	2.41	0.54
1:A:19:HIS:HD2	1:A:21:ALA:H	1.56	0.54
1:B:368:ALA:O	1:B:370:GLU:N	2.41	0.53
1:B:364:THR:HG22	3:F:125:ARG:HB3	1.90	0.53
2:C:19:GLU:OE2	2:C:31:ARG:NH1	2.42	0.53
1:B:19:HIS:HD2	1:B:21:ALA:H	1.56	0.53
2:C:1057:LEU:H	2:C:1057:LEU:HD23	1.72	0.53
1:B:98:GLU:N	1:B:98:GLU:OE1	2.43	0.52
2:D:207:ARG:NH1	2:D:224:LEU:O	2.44	0.51
2:C:886:PHE:O	2:C:1034:ARG:NH1	2.44	0.51
1:B:255:ARG:NH2	1:B:299:SER:OG	2.44	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:E:172:TYR:O	3:E:233:GLN:NE2	2.44	0.50
1:A:255:ARG:NH2	1:A:299:SER:OG	2.44	0.50
1:A:66:SER:OG	1:A:67:GLN:N	2.44	0.50
3:G:162:VAL:HG13	3:G:186:ILE:HG21	1.94	0.50
1:B:66:SER:OG	1:B:67:GLN:N	2.44	0.50
3:E:143:HIS:CE1	3:E:160:VAL:HG22	2.47	0.49
1:A:98:GLU:OE1	1:A:98:GLU:N	2.46	0.49
3:G:143:HIS:CE1	3:G:160:VAL:HG22	2.47	0.49
3:E:162:VAL:HG13	3:E:186:ILE:HG21	1.95	0.48
1:B:32:LEU:H	1:B:32:LEU:HD23	1.78	0.48
1:B:153:SER:OG	1:B:157:ARG:NH1	2.47	0.48
2:C:214:LEU:HD13	2:C:993:ALA:HB3	1.96	0.48
1:B:177:ASP:N	1:B:177:ASP:OD1	2.46	0.48
2:D:214:LEU:HD13	2:D:993:ALA:HB3	1.95	0.48
3:H:182:GLU:O	3:H:186:ILE:HG12	2.14	0.47
2:C:1062:THR:O	2:C:1082:TRP:NE1	2.47	0.47
3:H:183:ARG:NH2	3:H:206:ASP:OD2	2.48	0.47
3:F:182:GLU:O	3:F:186:ILE:HG12	2.14	0.47
1:A:369:ILE:HD12	3:G:106:VAL:HB	1.97	0.47
1:B:93:LEU:O	1:B:104:THR:OG1	2.29	0.46
2:D:147:GLU:OE2	2:D:194:TYR:OH	2.30	0.46
3:F:111:GLY:N	3:F:116:GLN:HE22	2.13	0.46
1:A:177:ASP:N	1:A:177:ASP:OD1	2.46	0.46
3:G:214:ILE:HA	3:G:217:LEU:HG	1.97	0.46
3:F:183:ARG:NH2	3:F:206:ASP:OD2	2.48	0.46
3:E:214:ILE:HG23	3:E:217:LEU:HD12	1.97	0.46
3:G:144:PHE:HB2	3:G:210:ILE:HG21	1.98	0.45
1:A:204:ASP:OD1	1:A:207:ARG:NH1	2.49	0.45
1:B:251:GLN:O	1:B:255:ARG:HG2	2.17	0.45
3:H:219:ASN:HB2	3:H:220:PRO:HD2	1.99	0.45
1:A:251:GLN:O	1:A:255:ARG:HG2	2.17	0.44
2:D:269:TRP:CE3	2:D:822:VAL:HG11	2.53	0.44
3:E:134:SER:O	3:E:137:ILE:HG22	2.18	0.44
3:F:219:ASN:HB2	3:F:220:PRO:HD2	1.99	0.44
1:B:261:GLU:OE1	1:B:264:ARG:NH2	2.51	0.44
1:A:261:GLU:OE1	1:A:264:ARG:NH2	2.51	0.44
2:D:1062:THR:O	2:D:1082:TRP:NE1	2.48	0.44
1:B:232:LEU:HG	1:B:317:MET:HE2	2.00	0.43
3:E:121:HIS:HB3	3:E:124:VAL:HG22	1.99	0.43
3:E:144:PHE:HB2	3:E:210:ILE:HG21	2.00	0.43
2:C:54:ASP:OD2	2:C:83:TYR:OH	2.31	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:269:TRP:CE3	2:C:822:VAL:HG11	2.53	0.43
2:D:261:SER:O	2:D:264:PRO:HD2	2.18	0.43
1:A:363:ILE:HD12	1:A:363:ILE:HA	1.93	0.43
2:C:231:ALA:HB1	2:C:859:LEU:HD11	1.99	0.43
2:D:887:GLN:HE22	2:D:890:ARG:HH11	1.66	0.43
1:B:204:ASP:OD1	1:B:207:ARG:NH1	2.52	0.43
2:C:261:SER:O	2:C:264:PRO:HD2	2.18	0.43
2:D:887:GLN:NE2	2:D:890:ARG:HH11	2.17	0.43
2:D:231:ALA:HB1	2:D:859:LEU:HD11	2.00	0.43
3:H:162:VAL:HG13	3:H:186:ILE:HG21	2.01	0.43
3:G:158:ALA:HB3	3:G:210:ILE:HB	2.00	0.42
2:D:796:GLU:O	2:D:800:ARG:HG2	2.19	0.42
1:A:309:SER:O	1:A:313:VAL:HG23	2.20	0.42
1:B:98:GLU:HG2	1:B:99:GLY:N	2.35	0.42
3:G:157:GLN:HB3	3:G:209:ILE:HG23	2.01	0.42
3:G:198:LEU:HB3	3:G:214:ILE:HD11	2.01	0.42
1:B:19:HIS:CD2	1:B:21:ALA:H	2.37	0.42
2:D:256:ARG:NH2	2:D:923:GLU:OE1	2.52	0.42
3:H:117:ASP:OD2	3:H:128:ARG:NH2	2.52	0.42
1:B:257:SER:HA	1:B:260:LEU:HB2	2.02	0.41
2:C:11:GLU:OE1	2:C:1012:ARG:NH1	2.52	0.41
2:C:796:GLU:O	2:C:800:ARG:HG2	2.20	0.41
3:E:164:GLU:O	3:E:168:GLN:NE2	2.53	0.41
3:F:162:VAL:HG13	3:F:186:ILE:HG21	2.01	0.41
1:A:76:ALA:O	1:A:78:HIS:N	2.51	0.41
1:A:257:SER:HA	1:A:260:LEU:HB2	2.03	0.41
3:E:203:ASP:HB2	3:E:207:ARG:HB2	2.02	0.41
2:C:195:PHE:O	2:C:197:VAL:N	2.53	0.41
1:A:369:ILE:HG22	1:A:371:ARG:HG2	2.00	0.41
3:E:158:ALA:HB3	3:E:210:ILE:HB	2.03	0.41
2:C:127:LEU:HD23	2:C:141:LYS:HB3	2.03	0.41
2:D:195:PHE:O	2:D:197:VAL:N	2.54	0.41
1:A:260:LEU:HD23	1:A:260:LEU:HA	1.90	0.40
2:D:214:LEU:HD12	2:D:990:GLU:HG3	2.04	0.40
3:E:157:GLN:HB3	3:E:209:ILE:HG23	2.03	0.40

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	341/517 (66%)	326 (96%)	15 (4%)	0	100	100
1	B	341/517 (66%)	330 (97%)	11 (3%)	0	100	100
2	C	497/633 (78%)	478 (96%)	19 (4%)	0	100	100
2	D	497/633 (78%)	477 (96%)	20 (4%)	0	100	100
3	E	170/249 (68%)	168 (99%)	2 (1%)	0	100	100
3	F	187/249 (75%)	182 (97%)	5 (3%)	0	100	100
3	G	170/249 (68%)	168 (99%)	2 (1%)	0	100	100
3	H	187/249 (75%)	183 (98%)	4 (2%)	0	100	100
All	All	2390/3296 (72%)	2312 (97%)	78 (3%)	0	100	100

There are no Ramachandran outliers to report.

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	292/440 (66%)	287 (98%)	5 (2%)	60	83
1	B	292/440 (66%)	285 (98%)	7 (2%)	49	77
2	C	429/526 (82%)	423 (99%)	6 (1%)	67	86
2	D	429/526 (82%)	423 (99%)	6 (1%)	67	86
3	E	156/205 (76%)	154 (99%)	2 (1%)	69	87
3	F	164/205 (80%)	163 (99%)	1 (1%)	86	94

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
3	G	156/205 (76%)	154 (99%)	2 (1%)	69	87
3	H	164/205 (80%)	163 (99%)	1 (1%)	86	94
All	All	2082/2752 (76%)	2052 (99%)	30 (1%)	68	86

All (30) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	85	LEU
1	A	177	ASP
1	A	205	SER
1	A	238	LEU
1	A	254	LEU
1	B	32	LEU
1	B	54	LEU
1	B	94	VAL
1	B	177	ASP
1	B	205	SER
1	B	238	LEU
1	B	254	LEU
2	C	127	LEU
2	C	129	PHE
2	C	211	LEU
2	C	797	LEU
2	C	884	VAL
2	C	916	SER
2	D	116	ARG
2	D	127	LEU
2	D	129	PHE
2	D	797	LEU
2	D	916	SER
2	D	995	TYR
3	E	135	LEU
3	E	217	LEU
3	F	147	TYR
3	G	135	LEU
3	G	217	LEU
3	H	147	TYR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (47) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	6	GLN
1	A	19	HIS
1	A	80	GLN
1	A	252	GLN
1	B	6	GLN
1	B	19	HIS
1	B	80	GLN
1	B	252	GLN
2	C	858	GLN
2	D	858	GLN
2	D	887	GLN
3	E	57	GLN
3	E	69	HIS
3	E	110	GLN
3	E	127	GLN
3	E	149	GLN
3	E	170	GLN
3	E	196	HIS
3	E	233	GLN
3	F	57	GLN
3	F	80	ASN
3	F	110	GLN
3	F	116	GLN
3	F	127	GLN
3	F	142	GLN
3	F	149	GLN
3	F	157	GLN
3	F	168	GLN
3	F	205	HIS
3	G	57	GLN
3	G	69	HIS
3	G	110	GLN
3	G	127	GLN
3	G	149	GLN
3	G	170	GLN
3	G	196	HIS
3	G	233	GLN
3	H	57	GLN
3	H	80	ASN
3	H	110	GLN
3	H	116	GLN
3	H	127	GLN
3	H	142	GLN

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Mol	Chain	Res	Type
3	H	149	GLN
3	H	157	GLN
3	H	168	GLN
3	H	205	HIS

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-27480. 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 ⓘ
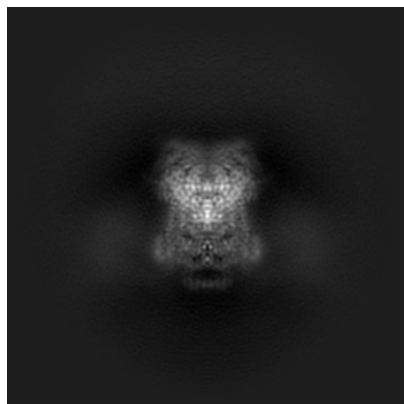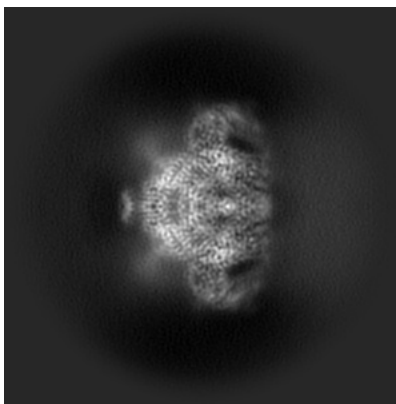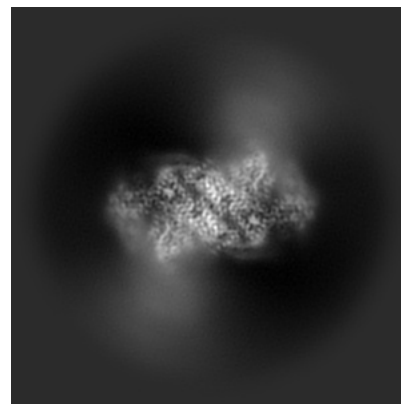
6.1.1 Primary map

X	Y	Z

6.1.2 Raw map

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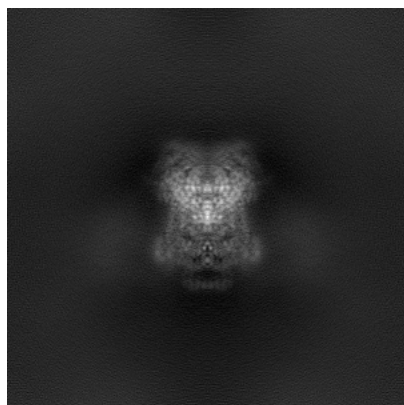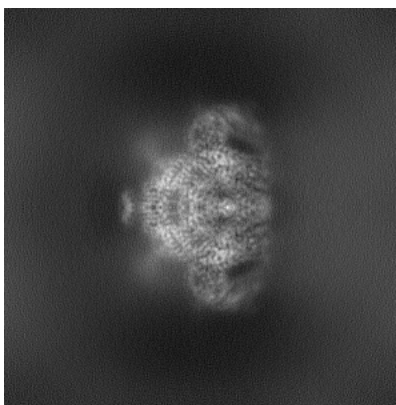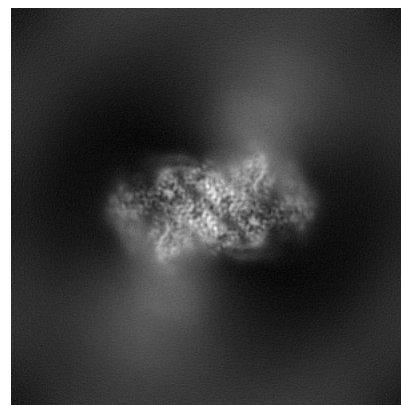
The images above show the map projected in three orthogonal directions.

6.2   Central slices ⓘ
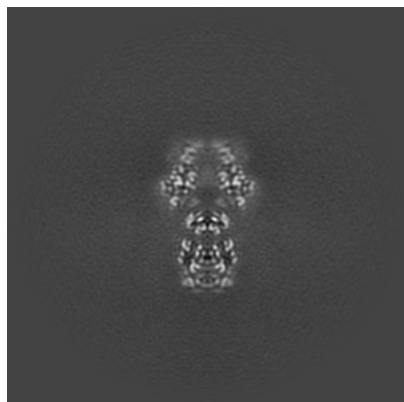
6.2.1   Primary map
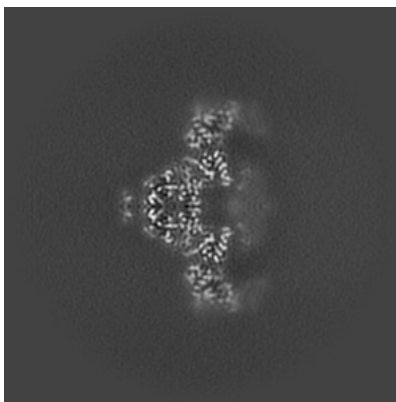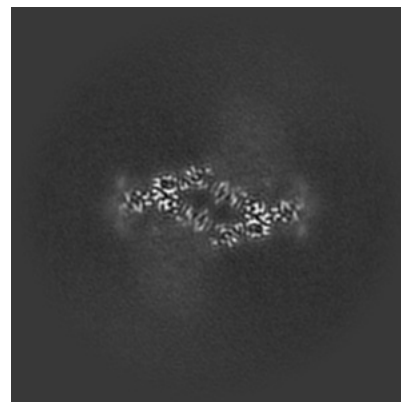
X Index: 192   Y Index: 192   Z Index: 192

6.2.2   Raw map
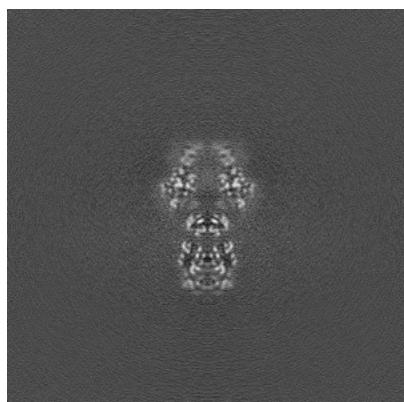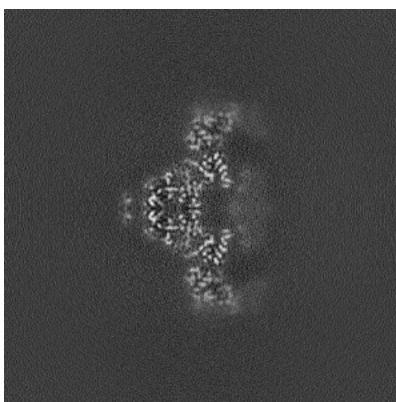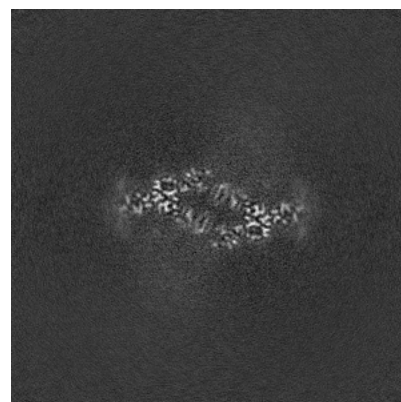
X Index: 192   Y Index: 192   Z Index: 192

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

6.3 Largest variance slices (i)

6.3.1 Primary map
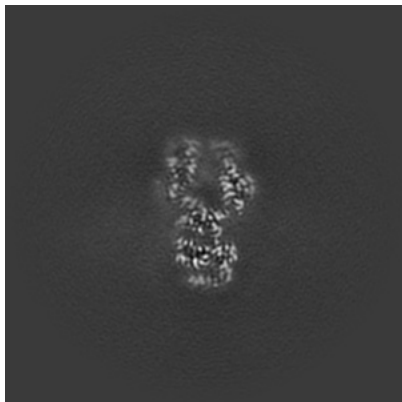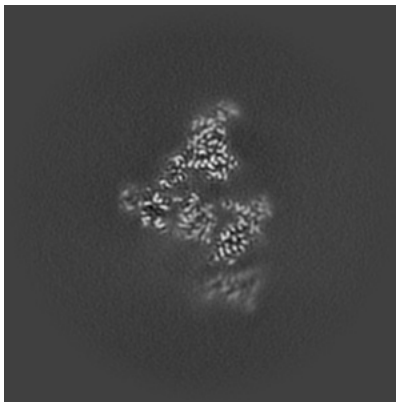
X Index: 188   Y Index: 179   Z Index: 211
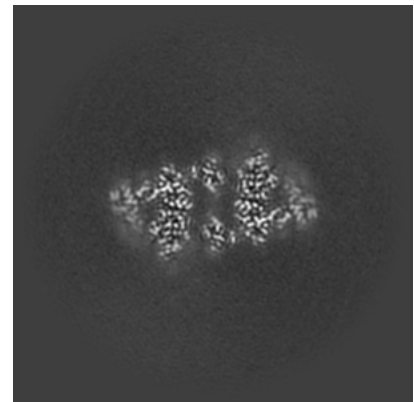
6.3.2 Raw map
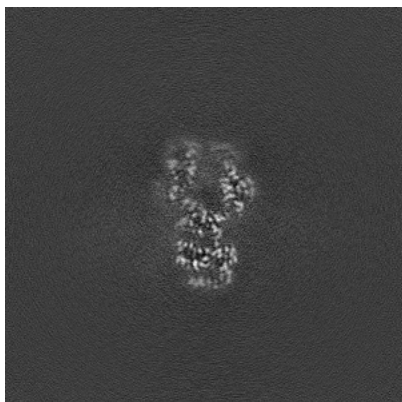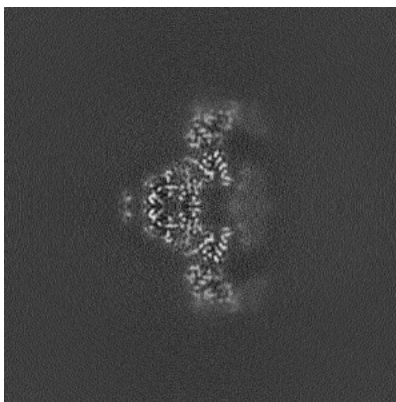
X Index: 188   Y Index: 192   Z Index: 211
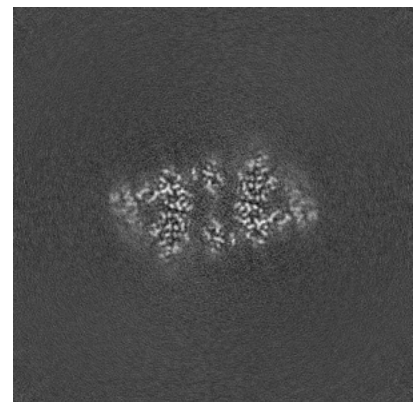
The images above show the largest variance slices of the map in three orthogonal directions.

6.4   Orthogonal surface views (i)

6.4.1   Primary map

X   Y   Z
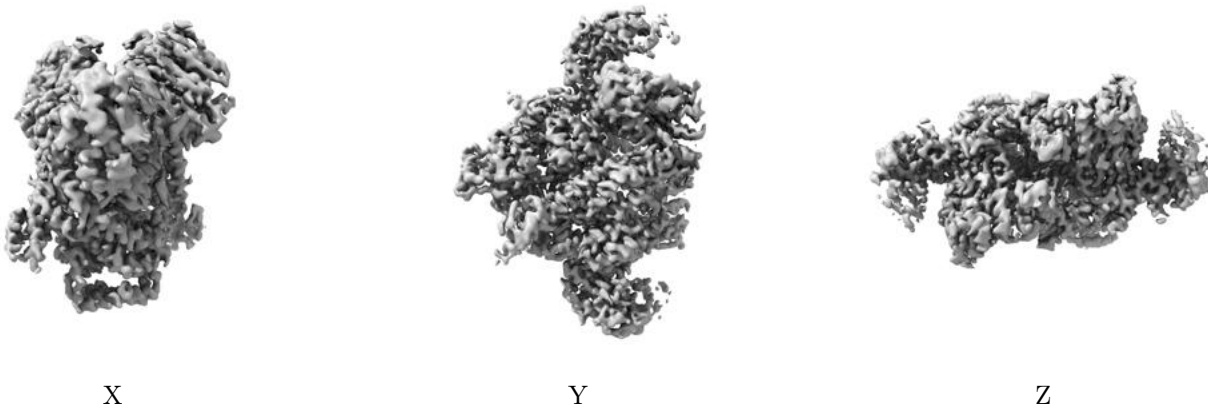
The images above show the 3D surface view of the map at the recommended contour level 0.11. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.4.2   Raw map

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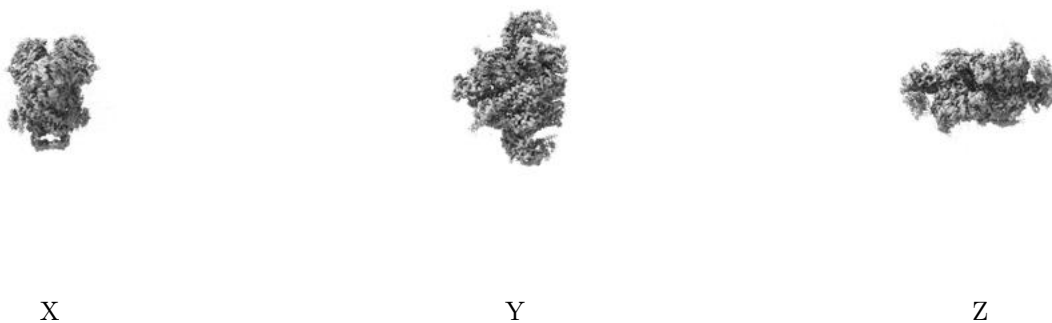
These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

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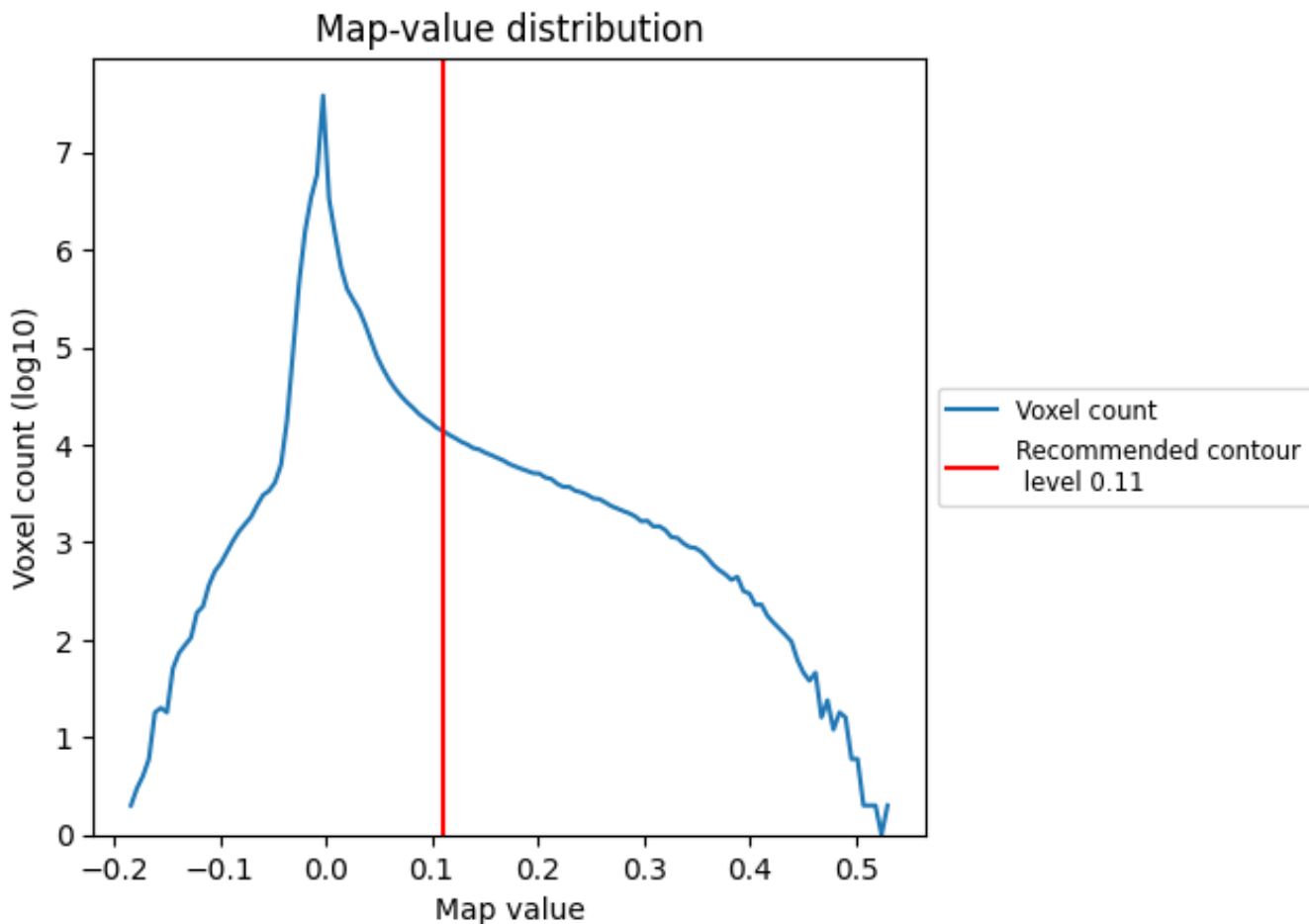
The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

7.2 Volume estimate (i)
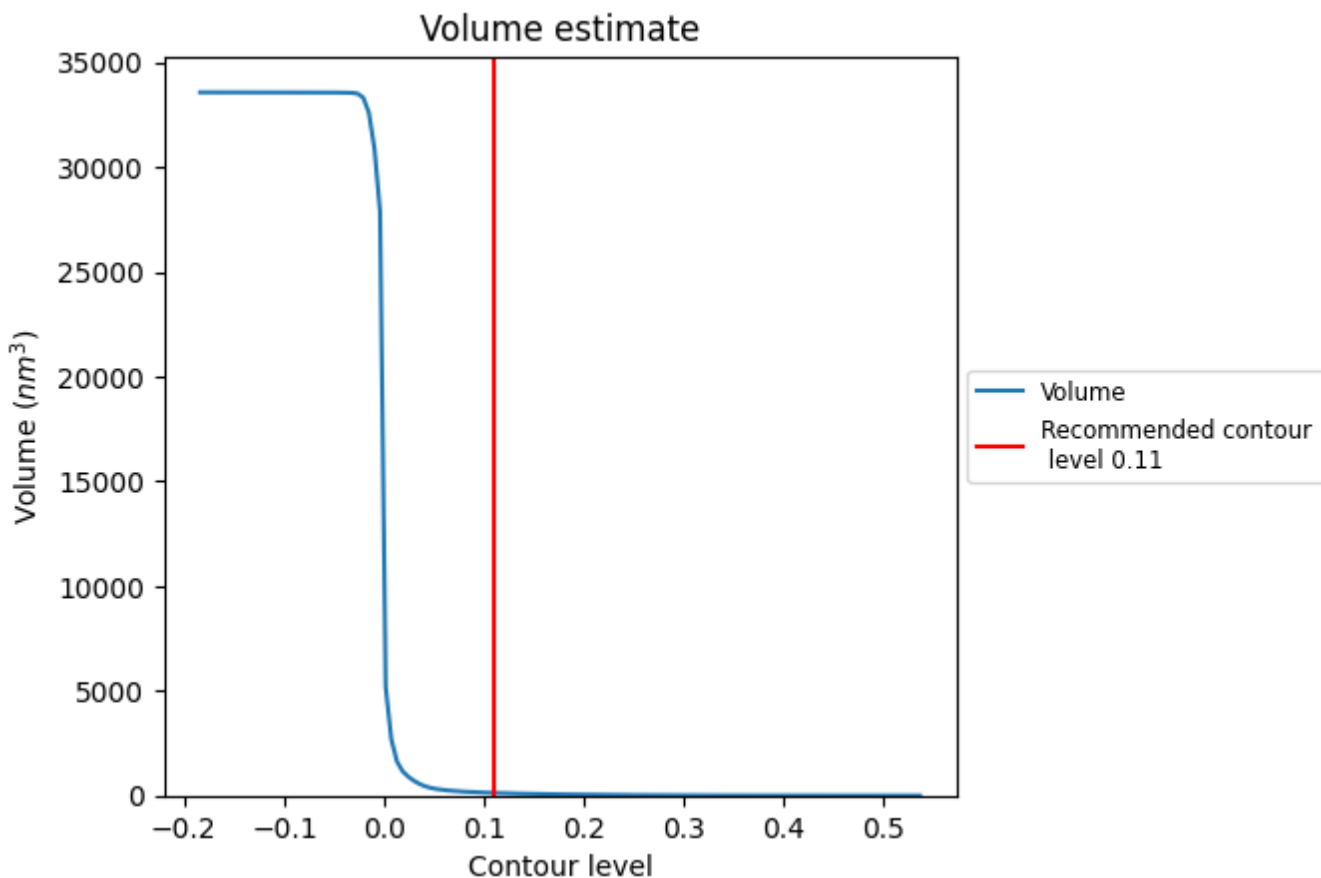
The volume at the recommended contour level is 125 nm^3; this corresponds to an approximate mass of 113 kDa.

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   ⓘ
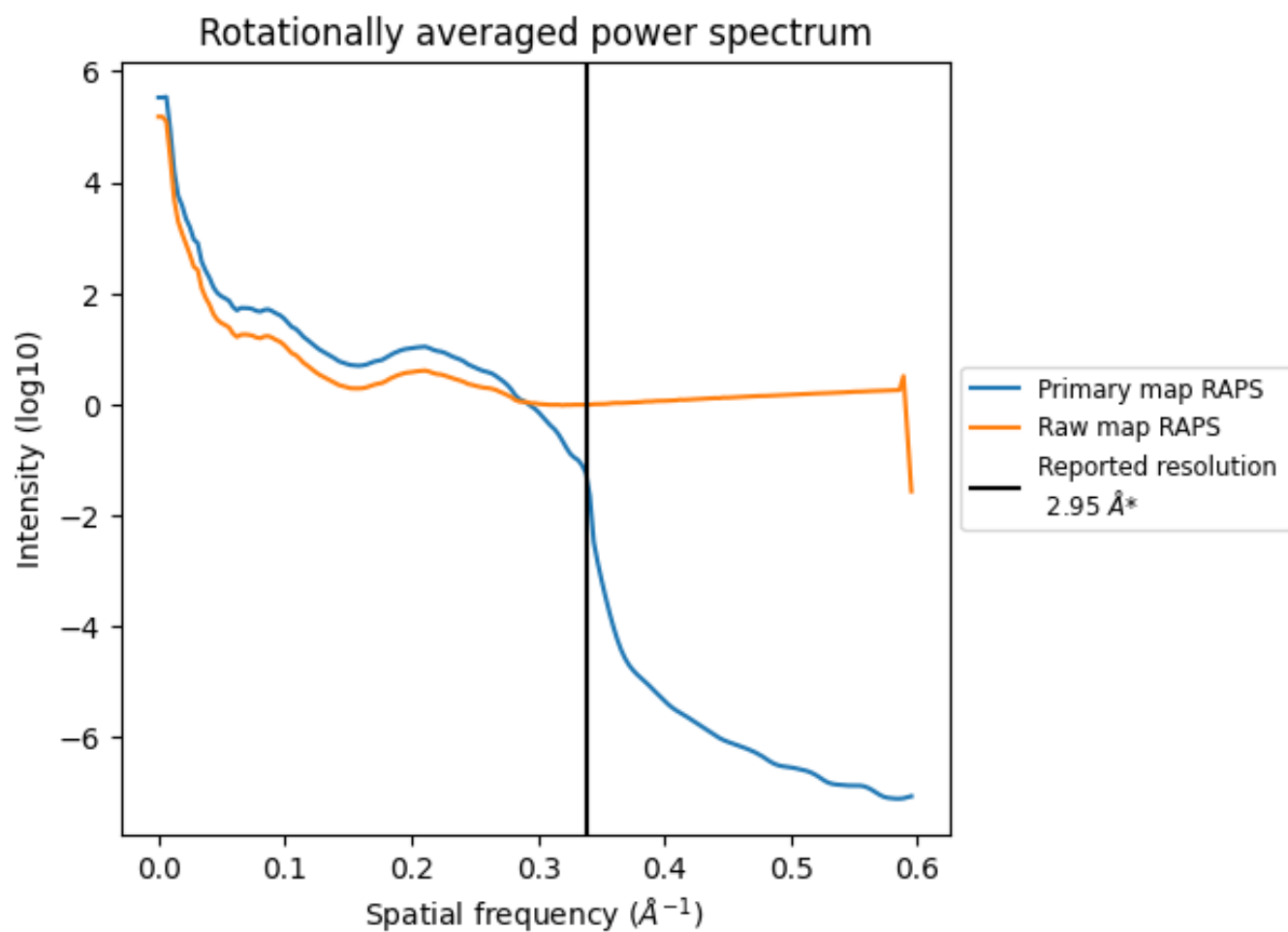
*Reported resolution corresponds to spatial frequency of 0.339 $Å^{-1}$

8 Fourier-Shell correlation ⓘ

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

8.1 FSC ⓘ
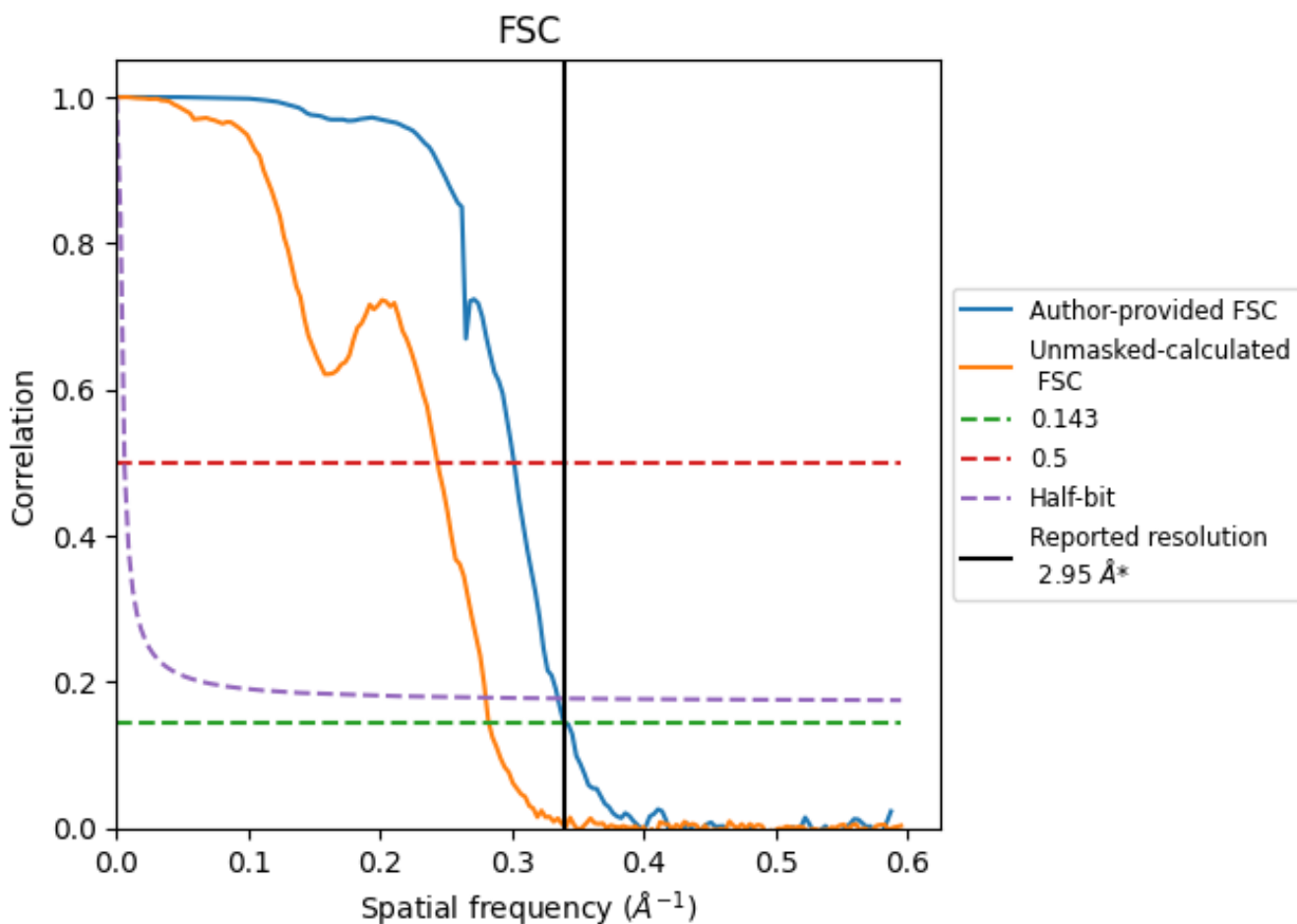
*Reported resolution corresponds to spatial frequency of 0.339 Å^{-1}

8.2 Resolution estimates (i)

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.95	-	-
Author-provided FSC curve	2.94	3.32	2.99
Unmasked-calculated*	3.54	4.11	3.57

*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 3.54 differs from the reported value 2.95 by more than 10 %

9 Map-model fit (i)

This section contains information regarding the fit between EMDB map EMD-27480 and PDB model 8DK1. Per-residue inclusion information can be found in section 3 on page 7.

9.1 Map-model overlay (i)

| X | Y | Z |
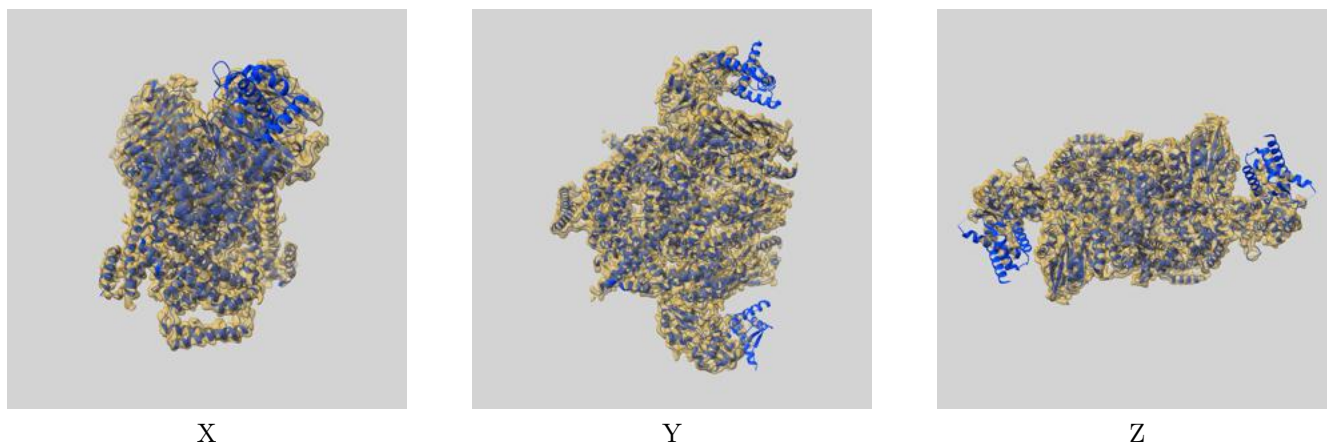
The images above show the 3D surface view of the map at the recommended contour level 0.11 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2   Q-score mapped to coordinate model (i)

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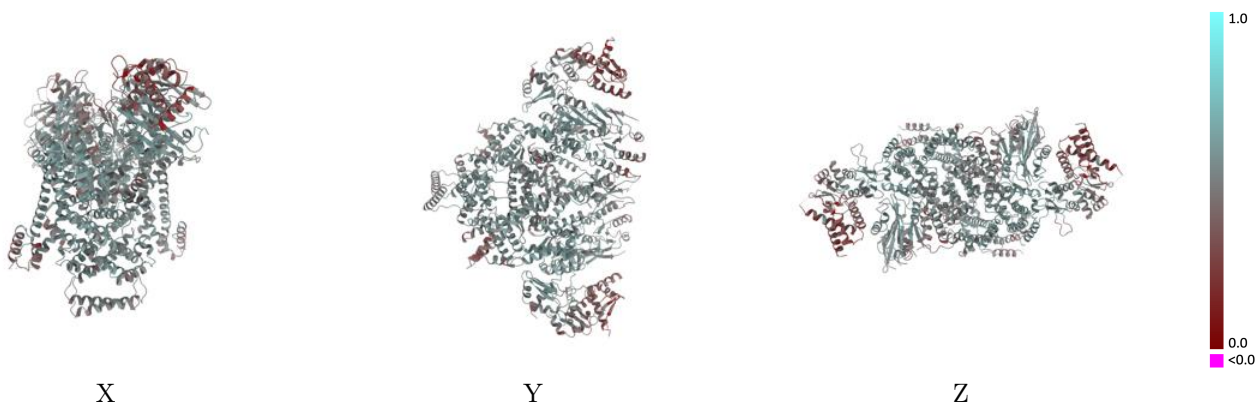
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

9.3   Atom inclusion mapped to coordinate model (i)

X   Y   Z
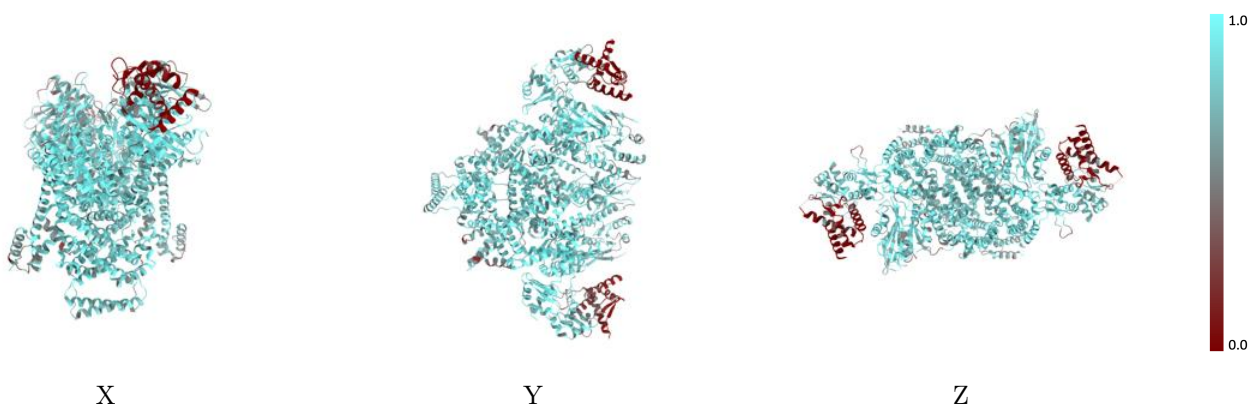
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.11).

9.4　Atom inclusion　ⓘ
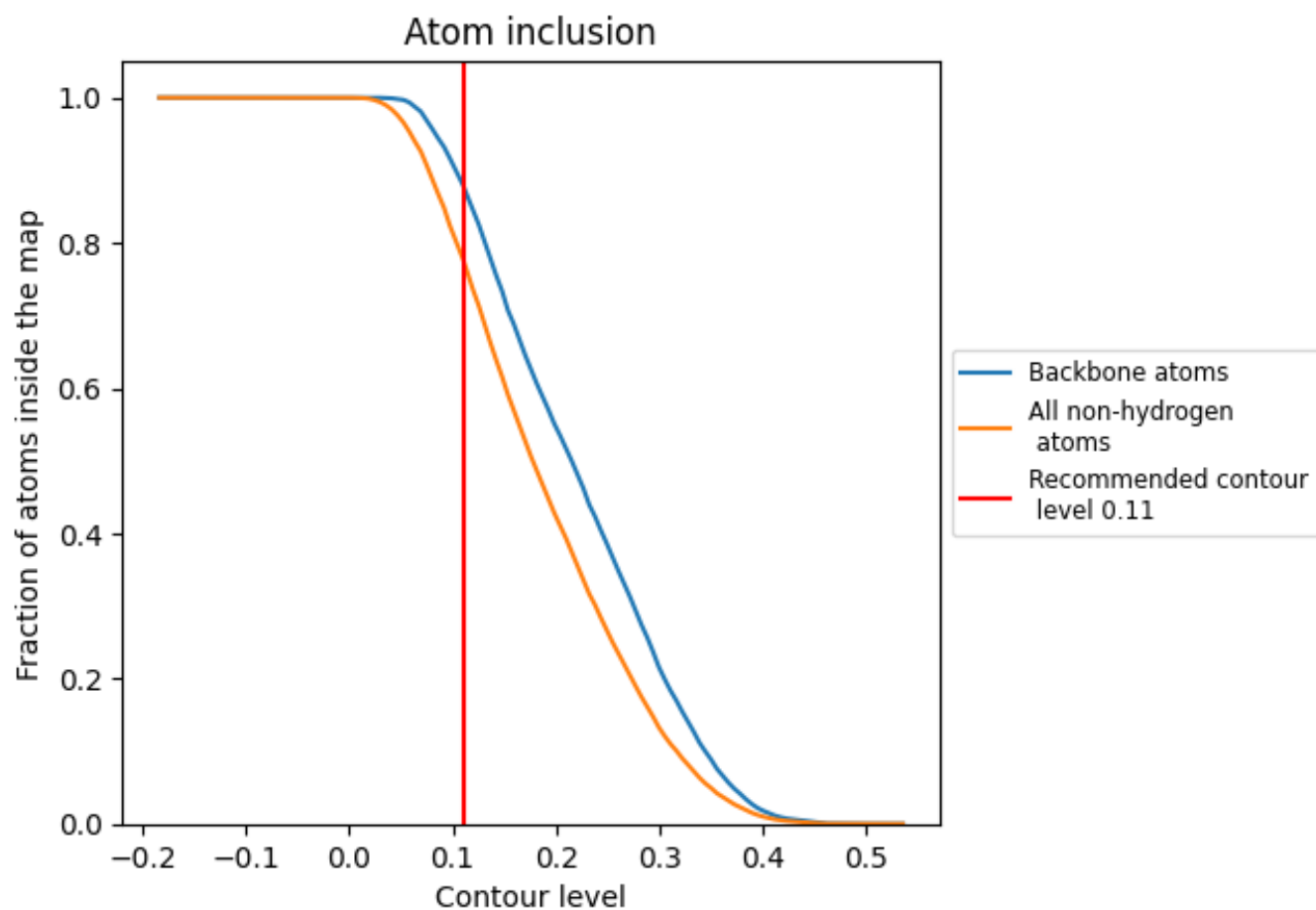
At the recommended contour level, 88% of all backbone atoms, 78% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary ⓘ

The table lists the average atom inclusion at the recommended contour level (0.11) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7777	0.5060
A	0.8732	0.5320
B	0.8739	0.5350
C	0.8142	0.5210
D	0.8135	0.5200
E	0.3708	0.3610
F	0.8871	0.5530
G	0.3708	0.3610
H	0.8871	0.5580

1.0

0.0
<0.0