W O R L D W I D E

wwPDB
P R O T E I N   D A T A   B A N K

wwPDB EM Validation Summary Report (i)

Mar 9, 2024 – 10:29 AM EST

PDB ID	:	6NUW
EMDB ID	:	EMD-0523
Title	:	Yeast Ctf19 complex
Authors	:	Hinshaw, S.M.; Harrison, S.C.
Deposited on	:	2019-02-03
Resolution	:	4.25 Å(reported)

1   Overall quality at a glance   ⓘ

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

The reported resolution of this entry is 4.25 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.
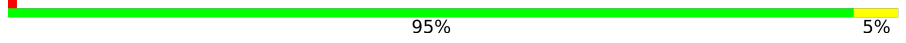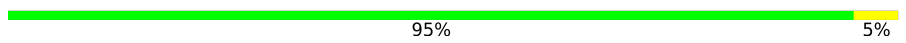
Metric	Percentile Ranks	Value
Clashscore		13
Ramachandran outliers		0.8%
Sidechain outliers		5.7%

Worse   *Better*

▮ Percentile relative to all structures

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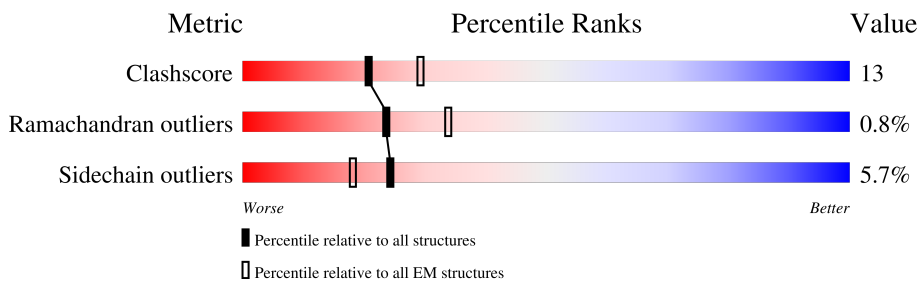
Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

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	B	248	6% — 62% / 35% · ·
2	C	371	· — 34% / 16% · 48%
3	D	369	· — 29% / 19% / 5% · 47%
4	E	461	6% — 54% / 23% · 20%
5	F	406	14% — 39% / 7% 53%
6	G	241	17% — 65% / 7% · 27%
7	I	330	11% — 41% / 10% 49%
8	H	773	· — 33% / 6% 61%

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Mol	Chain	Length	Quality of chain
8	Y	773	19% · 81%
9	J	153	24% 75% 20% · ·
10	X	126	· 95% 5%
11	M	75	95% 5%
12	U	23	87% 100%

2   Entry composition ⓘ

There are 12 unique types of molecules in this entry. The entry contains 16292 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 Inner kinetochore subunit IML3.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	B	244	Total 1962	C 1256	N 324	O 370	S 12	0	0

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	-2	SER	-	expression tag	UNP P38265
B	-1	ASN	-	expression tag	UNP P38265
B	0	ALA	-	expression tag	UNP P38265

- Molecule 2 is a protein called Inner kinetochore subunit MCM21.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	C	194	Total 1601	C 1039	N 261	O 297	S 4	0	0

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	-2	SER	-	expression tag	UNP Q06675
C	-1	ASN	-	expression tag	UNP Q06675
C	0	ALA	-	expression tag	UNP Q06675

- Molecule 3 is a protein called Inner kinetochore subunit CTF19.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	D	196	Total 1578	C 1011	N 277	O 280	S 10	0	0

- Molecule 4 is a protein called Inner kinetochore subunit CHL4.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	E	369	Total 2851	C 1848	N 492	O 500	S 11	0	0

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
E	-2	SER	-	expression tag	UNP P38907
E	-1	ASN	-	expression tag	UNP P38907
E	0	ALA	-	expression tag	UNP P38907

- Molecule 5 is a protein called Inner kinetochore subunit OKP1.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	F	190	Total 1360	C 835	N 247	O 273	S 5	0	0

- Molecule 6 is a protein called Inner kinetochore subunit NKP1.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	G	176	Total 1114	C 678	N 212	O 222	S 2	0	0

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
G	-2	SER	-	expression tag	UNP Q12493
G	-1	ASN	-	expression tag	UNP Q12493
G	0	ALA	-	expression tag	UNP Q12493

- Molecule 7 is a protein called Inner kinetochore subunit AME1.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	I	168	Total 1295	C 807	N 231	O 253	S 4	0	0

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
I	325	HIS	-	expression tag	UNP P38313
I	326	HIS	-	expression tag	UNP P38313
I	327	HIS	-	expression tag	UNP P38313
I	328	HIS	-	expression tag	UNP P38313

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Chain	Residue	Modelled	Actual	Comment	Reference
I	329	HIS	-	expression tag	UNP P38313
I	330	HIS	-	expression tag	UNP P38313

- Molecule 8 is a protein called Inner kinetochore subunit CTF3,Inner kinetochore subunit CTF3.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	H	302	Total 1668	C 1026	N 319	O 322	S 1	0	0
8	Y	150	Total 746	C 446	N 150	O 150		0	0

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
H	-2	SER	-	expression tag	UNP Q12748
H	-1	ASN	-	expression tag	UNP Q12748
H	0	ALA	-	expression tag	UNP Q12748
Y	-2	SER	-	expression tag	UNP Q12748
Y	-1	ASN	-	expression tag	UNP Q12748
Y	0	ALA	-	expression tag	UNP Q12748

- Molecule 9 is a protein called Inner kinetochore subunit NKP2.

Mol	Chain	Residues	Atoms				AltConf	Trace
9	J	147	Total 997	C 618	N 184	O 195	0	0

- Molecule 10 is a protein called Inner kinetochore subunit Mcm22.

Mol	Chain	Residues	Atoms				AltConf	Trace
10	X	126	Total 630	C 378	N 126	O 126	0	0

- Molecule 11 is a protein called Inner kinetochore subunit Mcm16.

Mol	Chain	Residues	Atoms				AltConf	Trace
11	M	75	Total 375	C 225	N 75	O 75	0	0

- Molecule 12 is a protein called Unknown (unassigned).

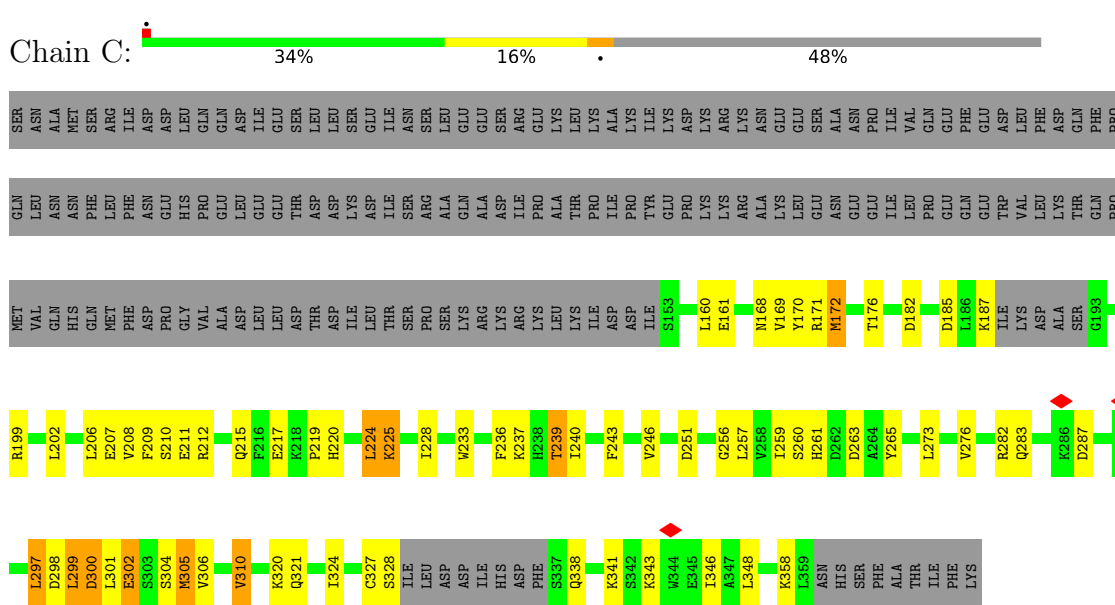| Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
12	U	23	115	69	23	23	0	0

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.
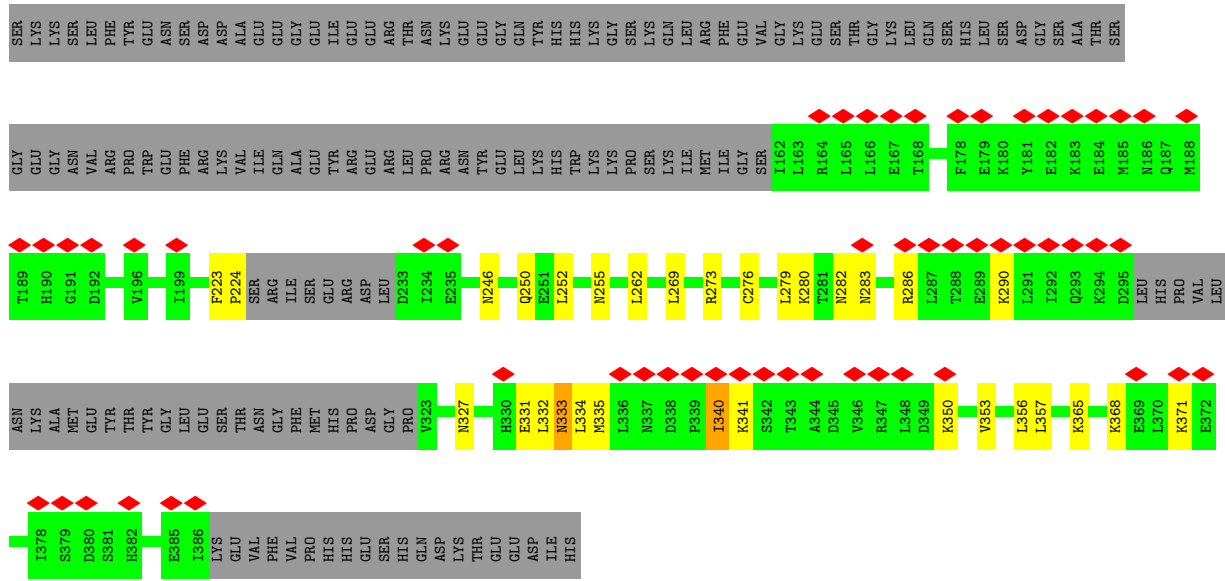
- Molecule 1: Inner kinetochore subunit IML3

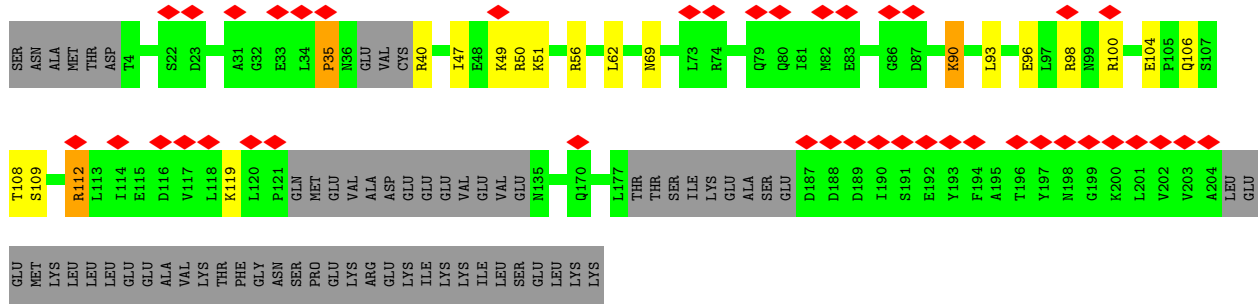- Molecule 2: Inner kinetochore subunit MCM21
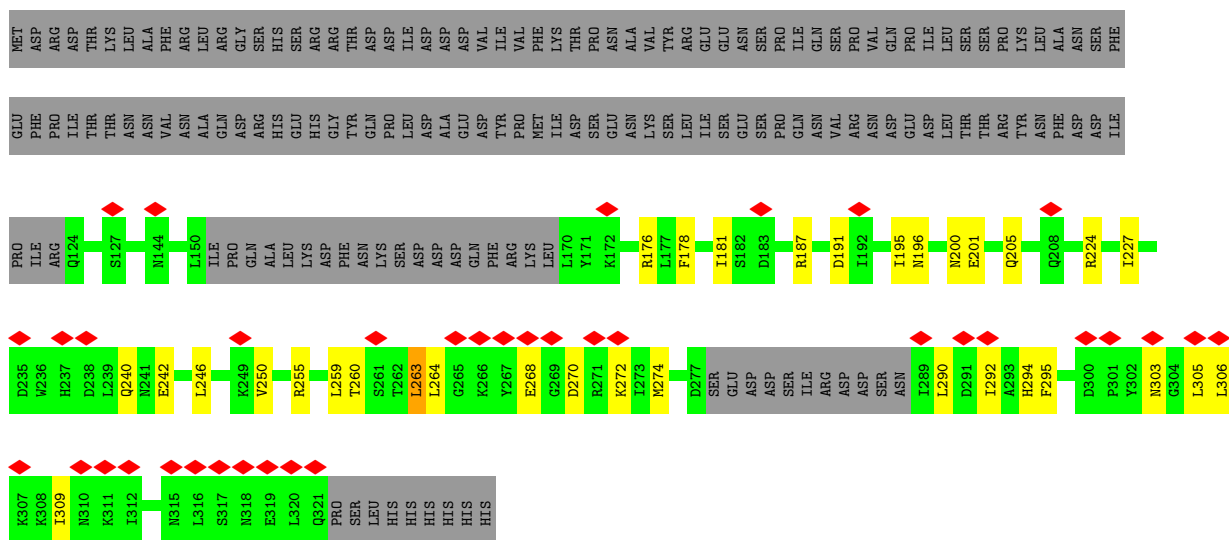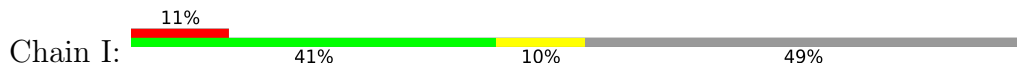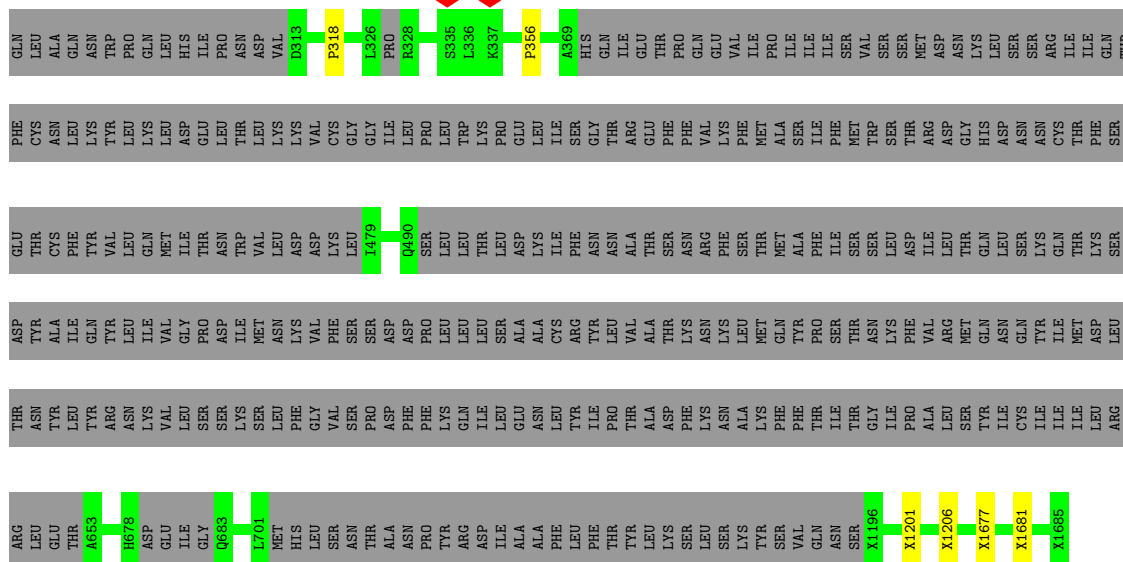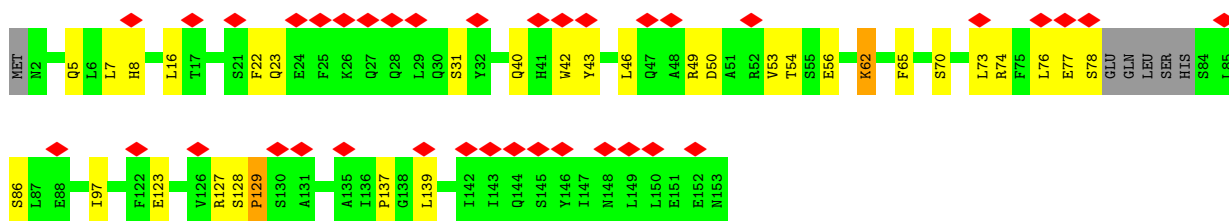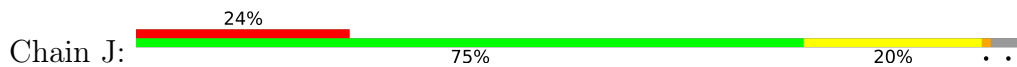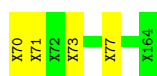

- Molecule 3: Inner kinetochore subunit CTF19

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

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

ASP ARG LYS ARG V125 E126 R127 I128 N129 G130 L131 T132 N133 L134 Q135 K136 E137 L138 D143 L147 L148 N149 M150 N151 L152 R153 L154 S155 Y156 P163 H164 L165 Q166 V167 S168 V169 Q170 S171 R172 D173 ARG VAL HIS N177 E181 V182 L183 V184 V185 N186 Y187 K188 N192 T193 M194

N195 P196 F197 E198 I199 Q200 F201 LYS MET PHE TYR LYS GLU ASP S210 T211 L212 L213 K214 W215 E216 I217 L218 R219 R225 L226 K229 Q230 L231 L232 A233 T234 R235 N236 F237 Q238 K239 C240 L241 L242 S243 L244 Y245 E246 F247 I250 K251 S252 L261 L264 R267 K268

C271 Y272 LEU MET ASN ASN SER ASP S279 L280 R284 VAL ILE ARG GLY ARG LEU THR THR ILE LYS LEU Q297 I301 I302 T303 M304 E307 R308 G309 K310 N313 C314 P317 MET SER LYS ILE SER ILE ALA LEU TRP LYS GLY GLY GLU ARG PHE N333 D338 E339

I345 L354 K355 C358 L362 F363 P364 ASP MET TYR ALA ARG

• Molecule 4: Inner kinetochore subunit CHL4

Chain E:

6%

54%   23%   •   20%

SER ASN ALA MET SER ASN GLU LEU ARG LEU GLU ASP ASN TYR VAL PRO THR SER D16 T17 L18 V19 V20 F21 K22 Q23 L24 M25 P28 V29 T30 V31 L32 Y33 L37 S38 W39 K42 PHE GLY GLY SER PHE ASP GLY D50 I51 Y52 L53 L54 T55 E56 L60 L61 I62 E63

K64 R67 R68 V72 N73 R74 I75 L76 Y77 W80 PRO ASP GLY L84 I92 D93 C94 H95 L96 M97 I98 S99 K100 P101 W106 L107 V120 F128 L132 K138 I139 Y140 H141 M146 F147 K148 H149 P150 S151 L152 P153 V154 L155 R158 I159 Q160 L161 F162

L167 PHE LEU SER THR PRO ASN ILE GLY SER ILE ASN LYS GLU SER LEU TYR ASN LYS LEU ASP LYS PHE GLN G191 K192 P193 P199 Y200 A203 F204 P205 L206 N207 S208 P209 I210 I211 F212 H213 S214 V215 D218 A221 S233 E234 R235 E236 T237 I238 Q244 K245 V248

K249 S250 N253 I254 L258 G259 P260 S261 R262 F263 A264 E265 S266 M267 G268 E271 C272 Y273 A274 N277 P282 L283 H284 G291 K295 R300 E301 F302 D303 F313 Y314 G315 K316 E317 E318 P319 E320 N329 F333 S336 ALA ASN GLY VAL MET ASP GLN LYS

TYR ASN ASP LEU LYS GLU PHE ASN GLU HIS VAL HIS ASN ILE ARG GLY LYS ASN GLU SER GLY GLU PRO VAL TYR ILE S374 L379 V380 T388 L389 K390 N391 R396 I397 I400 K401 L402 K403 F404 M407 D408 I409 G412 L413 H414 D418 I422 N423

I424 D425 L431 T441 I442 F447 A453 K454 GLY LEU LEU

• Molecule 5: Inner kinetochore subunit OKP1

Chain F:

14%

39%   7%   53%

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

• Molecule 6: Inner kinetochore subunit NKP1

Chain G:

17%
65%
7%
27%

• Molecule 7: Inner kinetochore subunit AME1

Chain I:

11%
41%
10%
49%

• Molecule 8: Inner kinetochore subunit CTF3,Inner kinetochore subunit CTF3

Chain H:

• Molecule 8: Inner kinetochore subunit CTF3,Inner kinetochore subunit CTF3

Chain Y:

GLN LEU ALA GLN ASN TRP PRO GLN LEU HIS ILE PRO ASN ASP VAL **D313** **P318** **L326** **PRO** **R328** **S335** **L336** **K337** **P356** **A369** HIS GLN ILE GLU THR PRO GLN VAL GLU VAL ILE PRO ILE ILE SER VAL SER SER MET ASP ASN LYS SER ARG ILE ILE GLN THR

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

GLU THR CYS PHE TYR VAL LEU GLN MET ILE THR ASN VAL LEU ASP ASP LYS LEU **I479** **Q490** SER LEU LEU THR LEU ASP LYS ILE PHE ASN ASN ALA THR SER ASN ARG PHE SER THR ALA PHE ILE PHE SER SER LEU ASP ILE LEU THR GLN LEU SER LYS GLN THR LYS SER

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

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

ARG LEU GLU THR **A653** **H678** ASP GLU ILE GLY **Q683** **L701** MET HIS LEU SER ASN THR ALA ASN PRO TYR ARG ASP ILE ALA PHE LEU PHE THR TYR LEU LYS SER LEU SER TYR SER VAL GLN ASN SER **X1196** **X1201** **X1206** **X1677** **X1681** **X1685**

• Molecule 9: Inner kinetochore subunit NKP2

24%

Chain J:

75%   20%

MET **N2** **Q5** **L6** **L7** **H8** **L16** **T17** **S21** **F22** **Q23** **E24** **F25** **K26** **Q27** **Q28** **L29** **Q30** **S31** **Y32** **Q40** **H41** **W42** **Y43** **L46** **Q47** **A48** **R49** **D50** **A51** **R52** **V53** **T54** **S55** **E56** **K62** **F65** **S70** **L73** **R74** **F75** **L76** **E77** **S78** GLU GLN LEU SER HIS **S84** **L85**

S86 **L87** **E88** **I97** **F122** **E123** **V126** **R127** **S128** **P129** **S130** **A131** **A135** **I136** **P137** **G138** **L139** **I142** **I143** **Q144** **S145** **Y146** **I147** **N148** **L149** **L150** **E151** **E152** **N153**

• Molecule 10: Inner kinetochore subunit Mcm22

Chain X:

95%   5%

X71 **X72** **X105** **X109** **X119** **X123** **X124** **X125** **X129** **X208**

• Molecule 11: Inner kinetochore subunit Mcm16

Chain M:

95%   5%

X70 **X71** **X72** **X73** **X77** **X164**

• Molecule 12: Unknown (unassigned)

87%

Chain U:

100%

X1 **X2** **X3** **X4** **X5** **X6** **X7** **X8** **X9** **X10** **X11** **X12** **X13** **X14** **X15** **X16** **X17** **X20** **X21** **X22** **X23**

WORLDWIDE
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PROTEIN DATA BANK

4 Experimental information ⓘ

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	119469	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI POLARA 300	Depositor
Voltage (kV)	300	Depositor
Electron dose $(e^-/\text{Å}^2)$	47	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	0.175	Depositor
Minimum map value	-0.096	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.004	Depositor
Recommended contour level	0.03	Depositor
Map size (Å)	373.92, 373.92, 373.92	wwPDB
Map dimensions	304, 304, 304	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.23, 1.23, 1.23	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	B	0.76	1/2002 (0.0%)	0.83	2/2713 (0.1%)
2	C	0.79	0/1630	0.87	1/2190 (0.0%)
3	D	0.52	0/1598	0.77	1/2146 (0.0%)
4	E	0.74	1/2912 (0.0%)	0.88	6/3943 (0.2%)
5	F	0.36	0/1367	0.65	2/1845 (0.1%)
6	G	0.36	0/1115	0.62	2/1513 (0.1%)
7	I	0.37	0/1303	0.76	1/1754 (0.1%)
8	H	0.46	0/1674	0.74	16/2316 (0.7%)
8	Y	0.37	0/556	0.51	2/768 (0.3%)
9	J	0.36	0/1006	0.65	3/1371 (0.2%)
All	All	0.59	2/15163 (0.0%)	0.77	36/20559 (0.2%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
2	C	0	1
3	D	0	6
4	E	0	8
6	G	0	1
8	H	0	2
All	All	0	18

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	E	106	TRP	CB-CG	-7.07	1.37	1.50
1	B	5	TRP	CB-CG	-5.75	1.39	1.50

The worst 5 of 36 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	E	260	PRO	CA-N-CD	-8.54	99.54	111.50
9	J	129	PRO	N-CA-CB	7.12	111.85	103.30
9	J	46	LEU	CA-CB-CG	6.74	130.81	115.30
8	H	184	PRO	N-CA-CB	6.51	111.11	103.30
5	F	340	ILE	CG1-CB-CG2	-6.17	97.82	111.40

There are no chirality outliers.

5 of 18 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	C	310	VAL	Peptide
3	D	147	LEU	Peptide
3	D	149	ASN	Peptide
3	D	167	VAL	Peptide
3	D	197	PHE	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	B	1962	0	1968	54	0
2	C	1601	0	1618	88	0
3	D	1578	0	1614	125	0
4	E	2851	0	2789	94	0
5	F	1360	0	1181	14	0
6	G	1114	0	867	13	0
7	I	1295	0	1241	20	0
8	H	1668	0	945	18	0
8	Y	746	0	274	2	0
9	J	997	0	792	20	0
10	X	630	0	133	3	0
11	M	375	0	80	3	0
12	U	115	0	25	0	0
All	All	16292	0	13527	399	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 13.

The worst 5 of 399 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:D:234:THR:HA	3:D:235:ARG:CZ	1.41	1.47
3:D:134:LEU:CD2	3:D:150:MET:HE2	1.46	1.45
2:C:297:LEU:CD1	2:C:299:LEU:HD21	1.51	1.40
3:D:234:THR:HA	3:D:235:ARG:NH2	1.30	1.39
3:D:134:LEU:CD2	3:D:150:MET:CE	2.01	1.39

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	B	242/248 (98%)	203 (84%)	38 (16%)	1 (0%)	34	72
2	C	188/371 (51%)	160 (85%)	28 (15%)	0	100	100
3	D	184/369 (50%)	139 (76%)	43 (23%)	2 (1%)	14	52
4	E	359/461 (78%)	275 (77%)	78 (22%)	6 (2%)	9	44
5	F	184/406 (45%)	167 (91%)	16 (9%)	1 (0%)	29	68
6	G	168/241 (70%)	151 (90%)	16 (10%)	1 (1%)	25	65
7	I	162/330 (49%)	150 (93%)	12 (7%)	0	100	100
8	H	290/773 (38%)	242 (83%)	45 (16%)	3 (1%)	15	54
8	Y	103/773 (13%)	91 (88%)	12 (12%)	0	100	100
9	J	143/153 (94%)	121 (85%)	20 (14%)	2 (1%)	11	47
All	All	2023/4125 (49%)	1699 (84%)	308 (15%)	16 (1%)	24	60

5 of 16 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
9	J	129	PRO

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Mol	Chain	Res	Type
4	E	295	LYS
8	H	209	ILE
4	E	264	ALA
6	G	35	PRO

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	B	219/223 (98%)	209 (95%)	10 (5%)	27	54
2	C	183/349 (52%)	169 (92%)	14 (8%)	13	39
3	D	176/344 (51%)	154 (88%)	22 (12%)	4	22
4	E	291/418 (70%)	281 (97%)	10 (3%)	37	61
5	F	120/378 (32%)	114 (95%)	6 (5%)	24	51
6	G	72/221 (33%)	68 (94%)	4 (6%)	21	49
7	I	133/314 (42%)	128 (96%)	5 (4%)	33	58
8	H	47/685 (7%)	44 (94%)	3 (6%)	17	44
9	J	73/143 (51%)	72 (99%)	1 (1%)	67	80
All	All	1314/3075 (43%)	1239 (94%)	75 (6%)	24	48

5 of 75 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
5	F	286	ARG
8	H	86	ILE
5	F	333	ASN
6	G	112	ARG
3	D	127	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 28 such sidechains are listed below:

Mol	Chain	Res	Type
4	E	391	ASN
9	J	5	GLN
5	F	255	ASN
7	I	205	GLN
5	F	250	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 ⓘ

The following chains have linkage breaks:

Mol	Chain	Number of breaks
10	X	2
8	Y	1
11	M	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	Y	1213:UNK	C	1667:UNK	N	26.06

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Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	X	129:UNK	C	136:UNK	N	14.95
1	M	128:UNK	C	149:UNK	N	10.69
1	X	168:UNK	C	175:UNK	N	9.72

6 Map visualisation (i)

This section contains visualisations of the EMDB entry EMD-0523. These allow visual inspection of the internal detail of the map and identification of artifacts.

No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections (i)

6.1.1 Primary map

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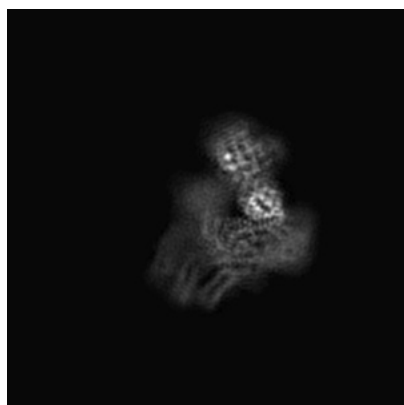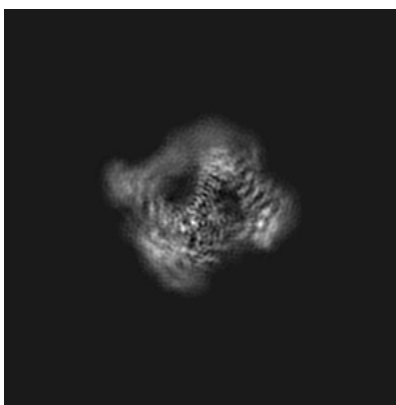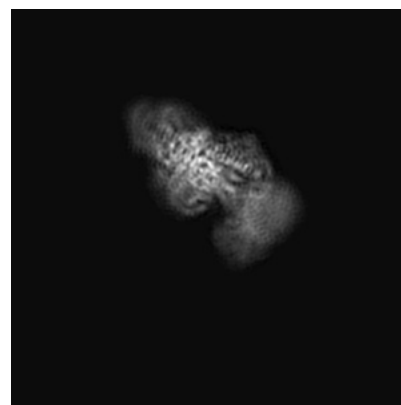
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

6.2.1 Primary map
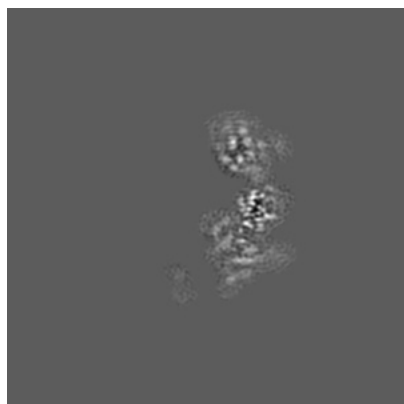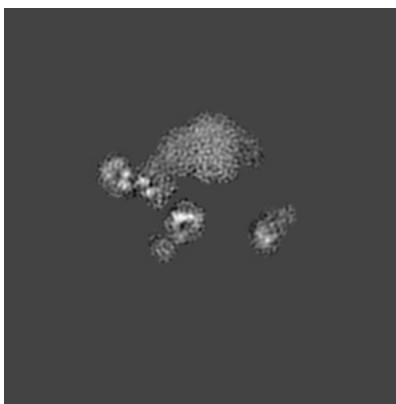
| X Index: 152 | Y Index: 152 | Z Index: 152 |
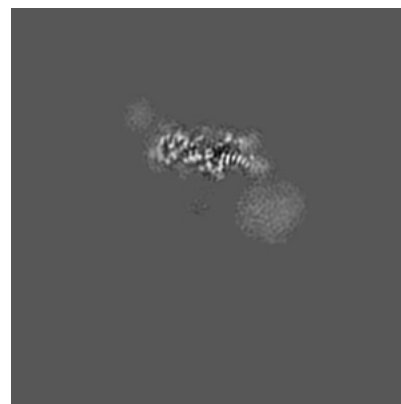
The images above show central slices of the map in three orthogonal directions.

6.3   Largest variance slices   ⓘ
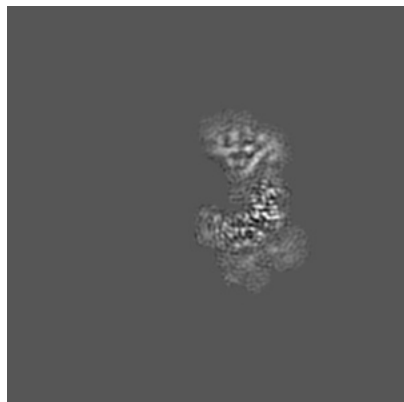
6.3.1   Primary map
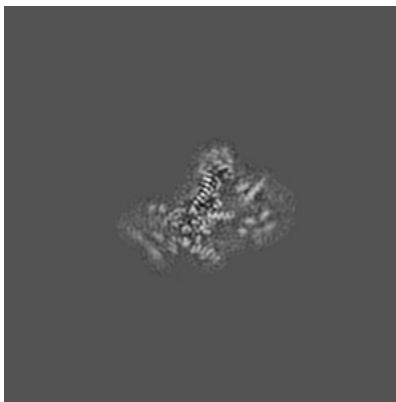
| X Index: 140 | Y Index: 188 | Z Index: 156 |
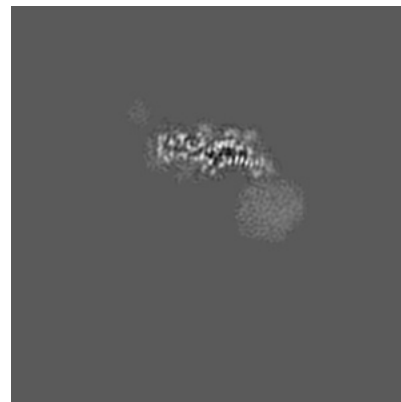
The images above show the largest variance slices of the map in three orthogonal directions.

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

6.4.1   Primary map

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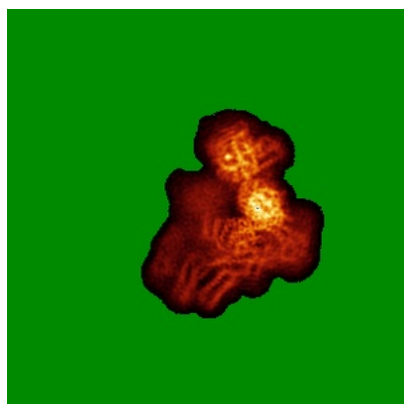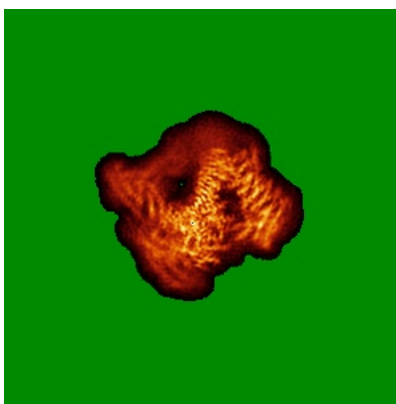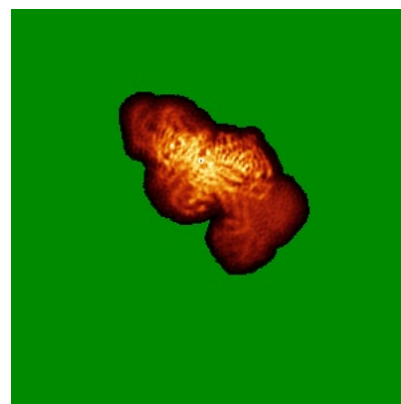
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5   Orthogonal surface views ⓘ

6.5.1   Primary map

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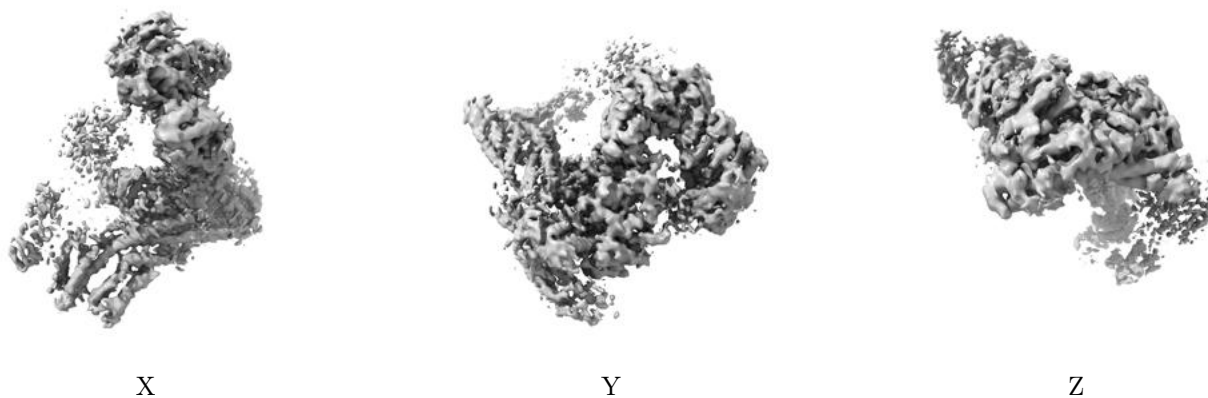
The images above show the 3D surface view of the map at the recommended contour level 0.03. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.6   Mask visualisation ⓘ

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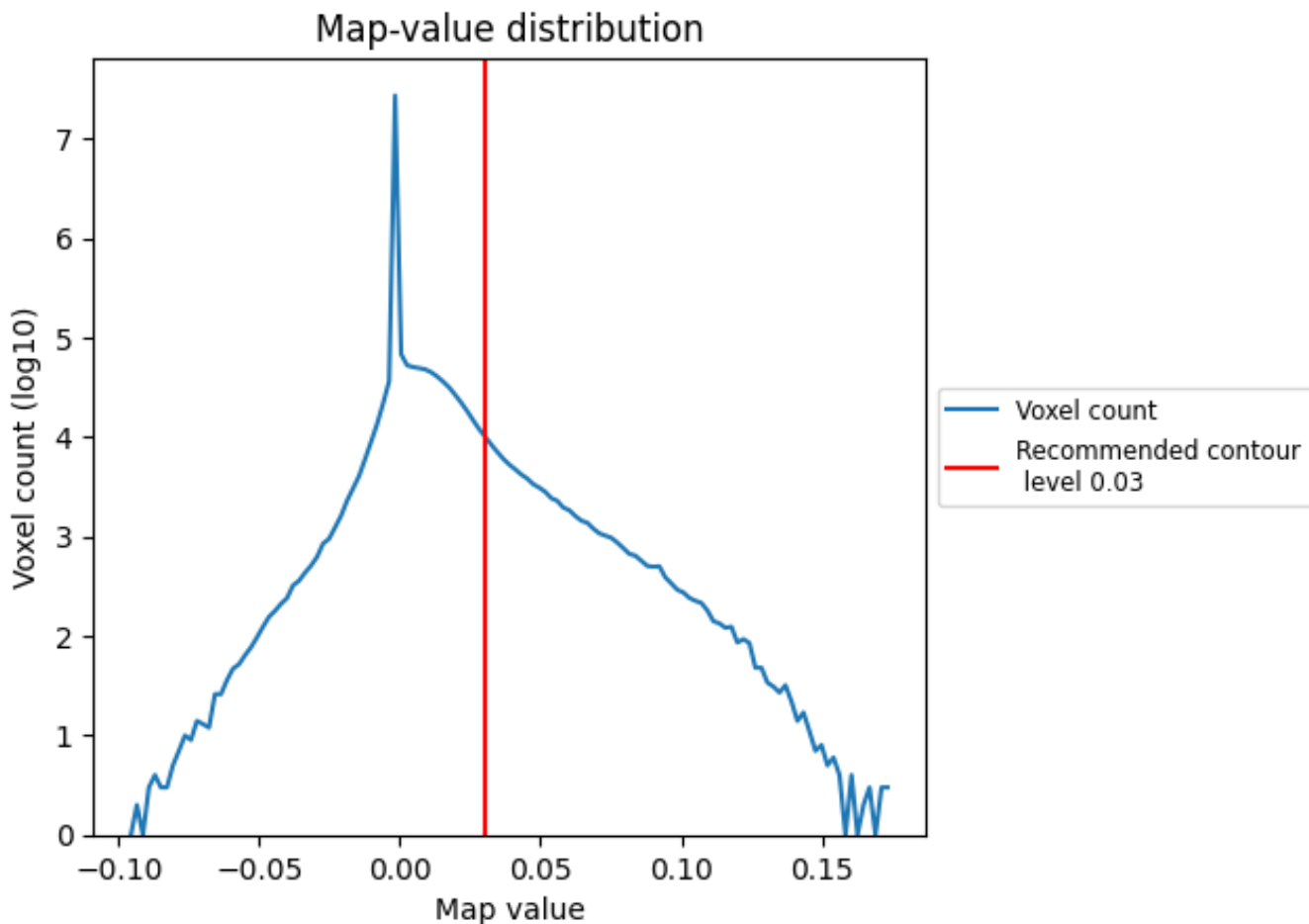
The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

7.2 Volume estimate (i)
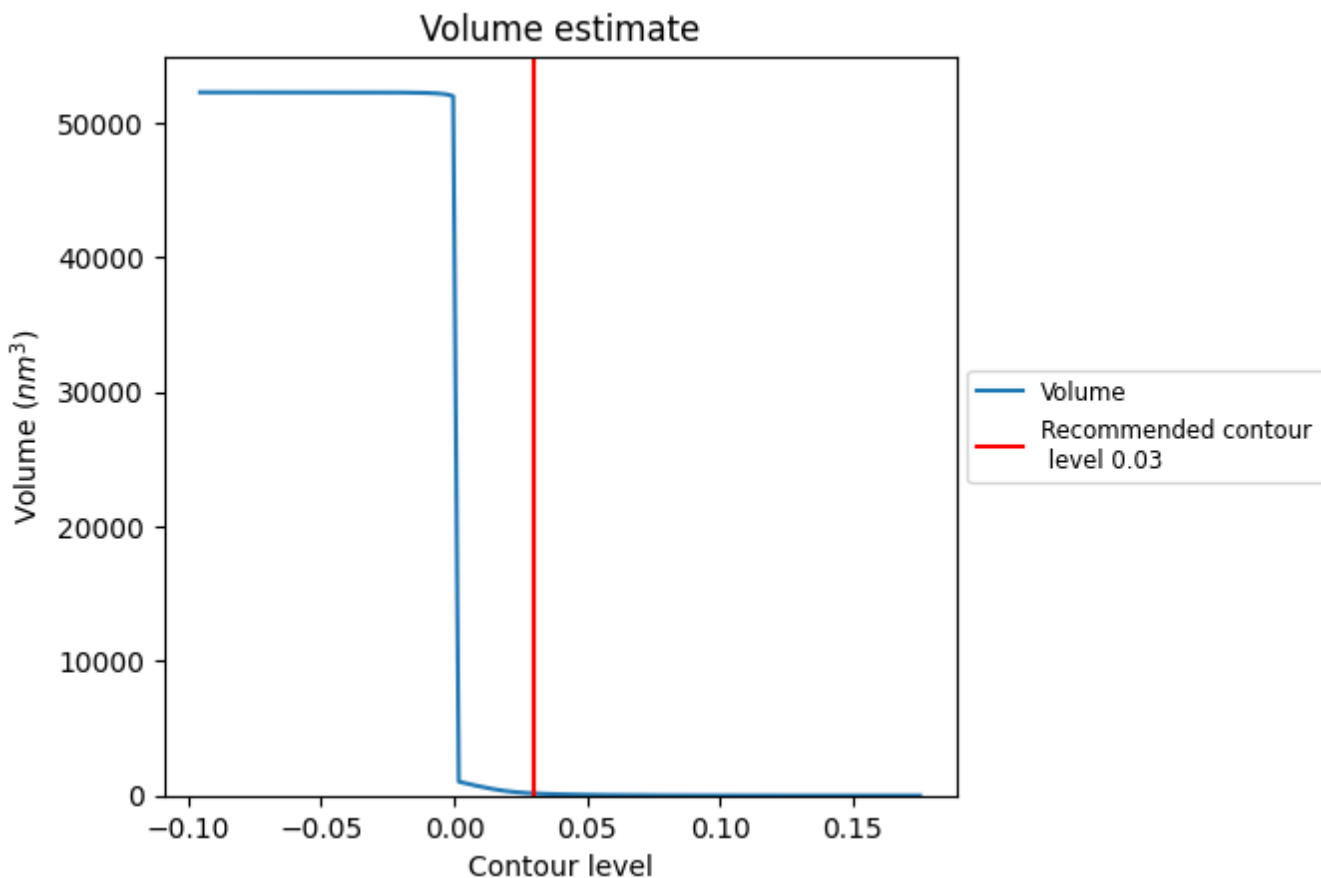
The volume at the recommended contour level is 161 nm^3; this corresponds to an approximate mass of 146 kDa.

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 ⓘ

Rotationally averaged power spectrum
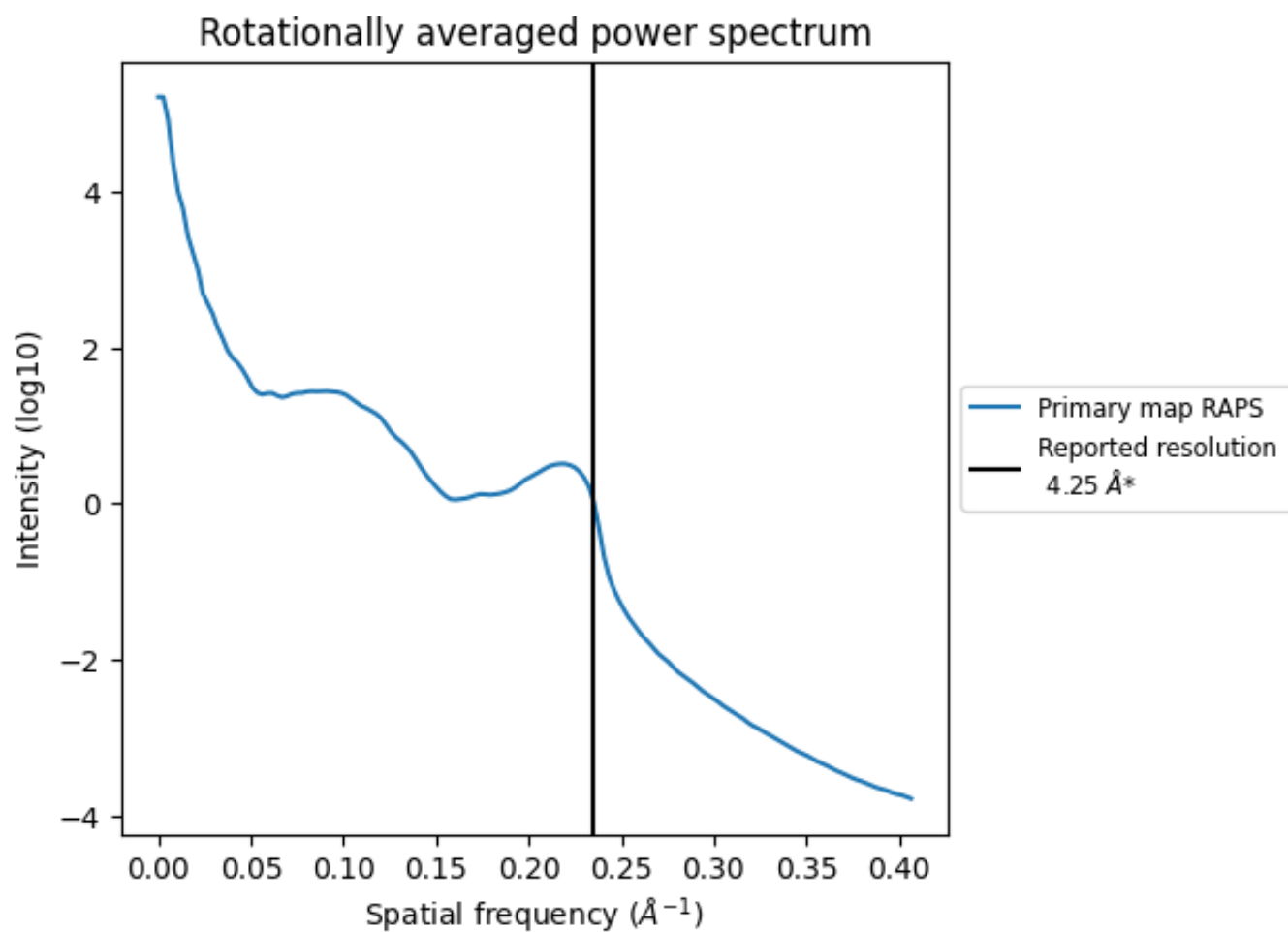
*Reported resolution corresponds to spatial frequency of 0.235 Å^{-1}

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)
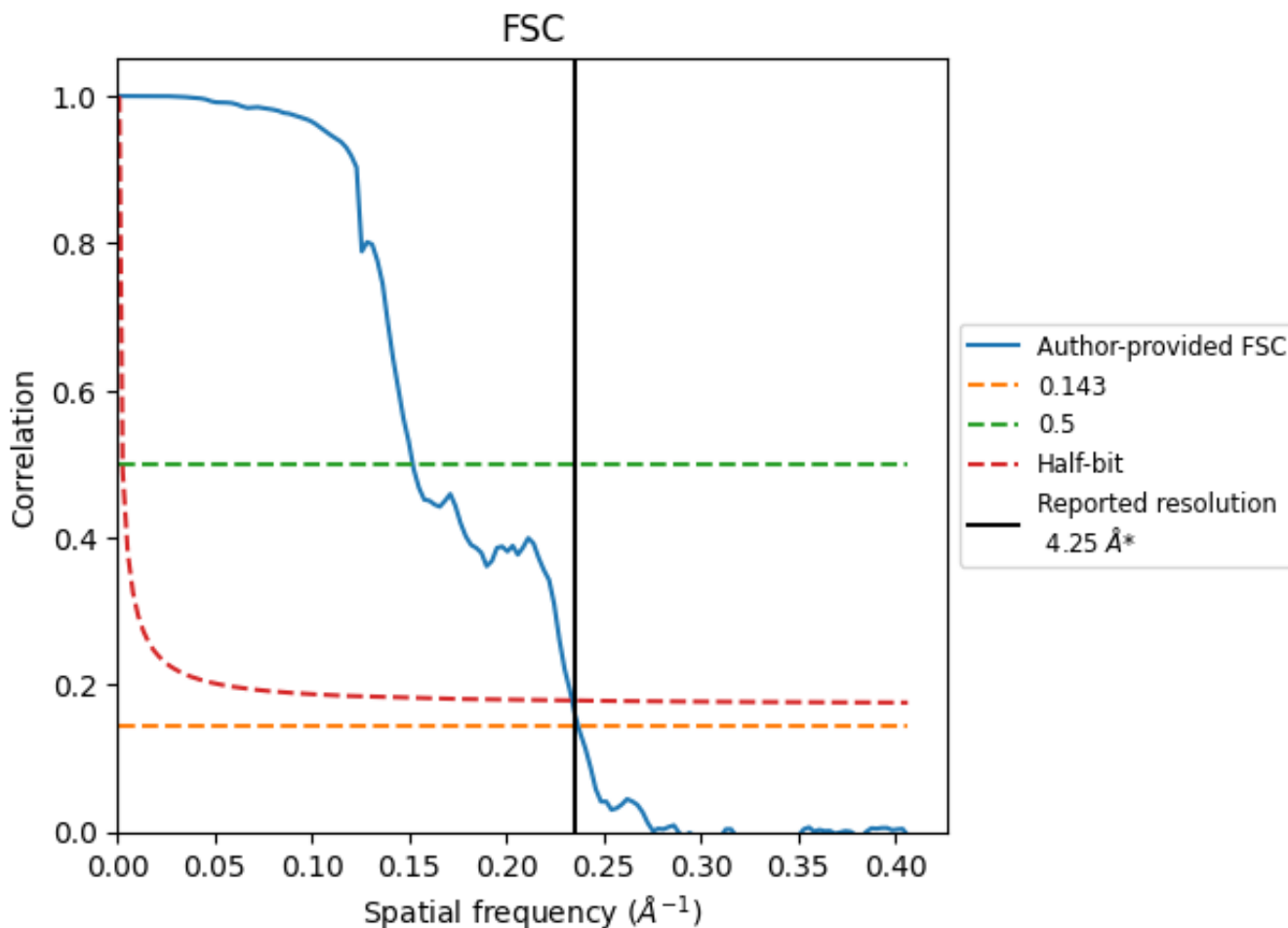
*Reported resolution corresponds to spatial frequency of 0.235 Å^{-1}

8.2   Resolution estimates ⓘ

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	4.25	-	-
Author-provided FSC curve	4.22	6.58	4.28
Unmasked-calculated*	-	-	-

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

9　Map-model fit　ⓘ

This section contains information regarding the fit between EMDB map EMD-0523 and PDB model 6NUW. Per-residue inclusion information can be found in section 3 on page 8.

9.1　Map-model overlay　ⓘ

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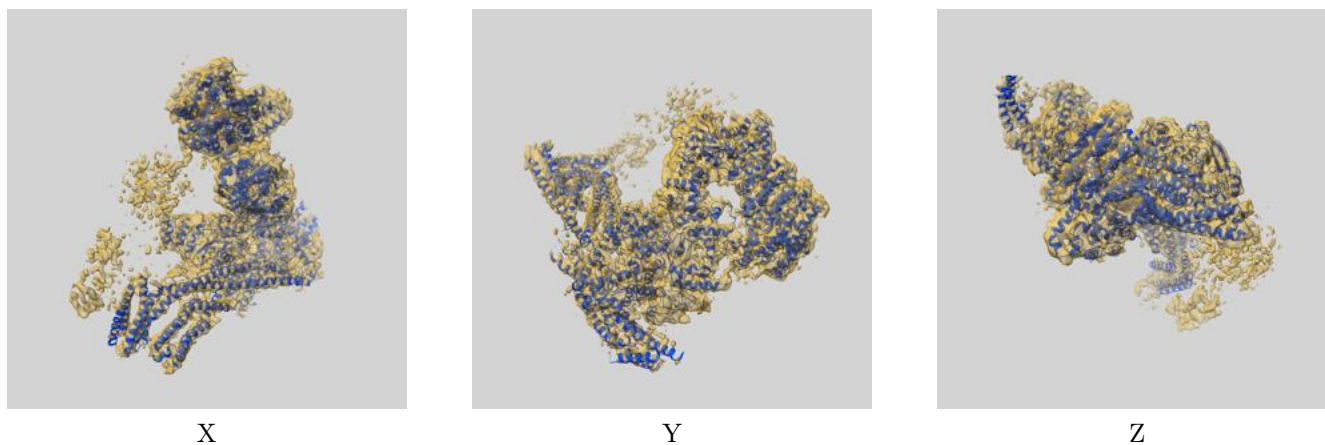
The images above show the 3D surface view of the map at the recommended contour level 0.03 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2   Q-score mapped to coordinate model   ⓘ
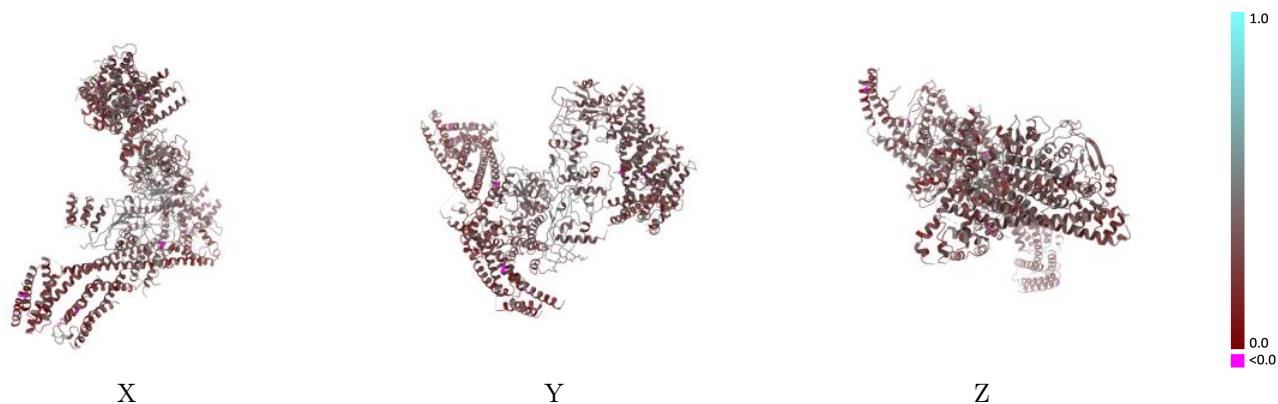
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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   ⓘ
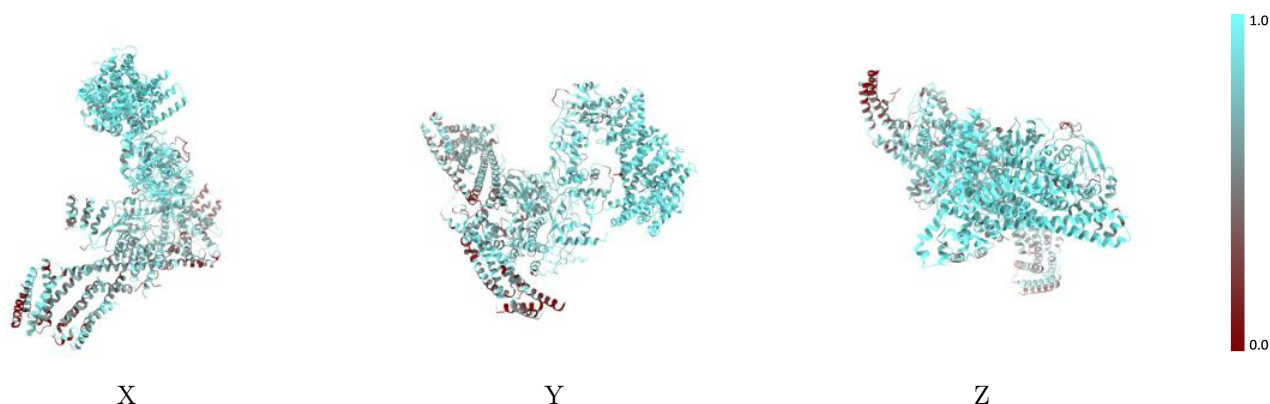
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.03).

9.4 Atom inclusion ⓘ
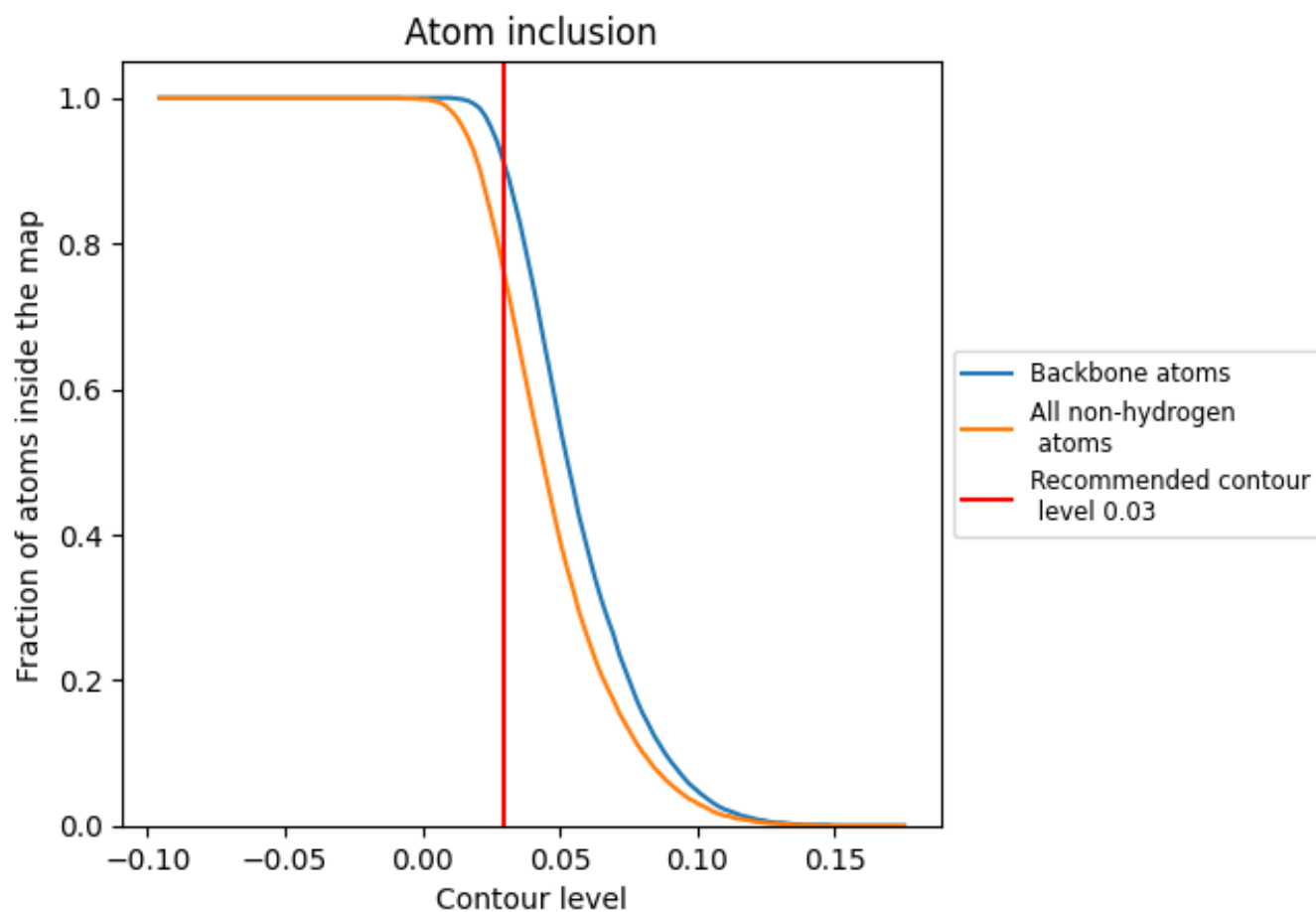
At the recommended contour level, 91% of all backbone atoms, 76% of all non-hydrogen atoms, are inside the map.

9.5   Map-model fit summary (i)

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

Chain	Atom inclusion	Q-score
All	0.7550	0.3420
B	0.8130	0.3820
C	0.7930	0.3810
D	0.7960	0.3560
E	0.7690	0.3960
F	0.5650	0.2940
G	0.6330	0.3020
H	0.9000	0.3400
I	0.5740	0.2670
J	0.5930	0.2740
M	0.9570	0.3370
U	0.1390	0.2250
X	0.9430	0.3200
Y	0.9520	0.3310

1.0

0.0
<0.0