Full wwPDB EM Validation Report ⓘ

Feb 24, 2024 – 08:57 AM EST

PDB ID	:	7KPV
EMDB ID	:	EMD-22989
Title	:	Structure of kinase and Central lobes of yeast CKM
Authors	:	Li, Y.C.; Chao, T.C.; Kim, H.J.; Cholko, T.; Chen, S.F.; Nakanishi, K.; Chang, C.E.; Murakami, K.; Garcia, B.A.; Boyer, T.G.; Tsai, K.L.
Deposited on	:	2020-11-12
Resolution	:	3.80 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 ⓘ symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

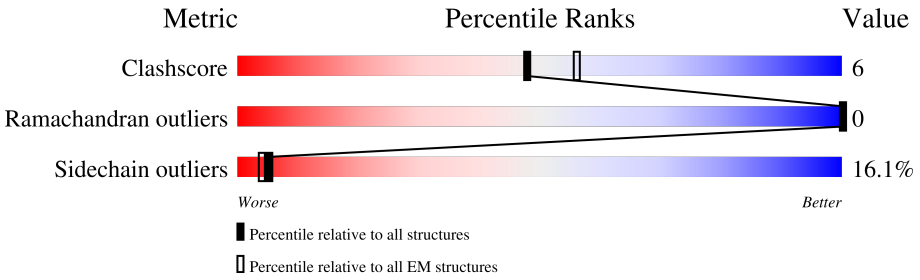
EMDB validation analysis	:	0.0.1.dev70
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 3.80 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for >=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	555	33% 47% 15% • 36%
2	B	323	22% 68% 20% • 10%
3	C	1427	14% 25% 8% • 66%
4	D	1420	15% 47% 13% • 38%

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 16449 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 Meiotic mRNA stability protein kinase SSN3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	357	2952	1919	512	507	14	0	0

- Molecule 2 is a protein called RNA polymerase II holoenzyme cyclin-like subunit.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	290	2436	1591	404	429	12	0	0

- Molecule 3 is a protein called Mediator of RNA polymerase II transcription subunit 12.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	C	487	4049	2618	679	735	17	0	0

- Molecule 4 is a protein called Mediator of RNA polymerase II transcription subunit 13.

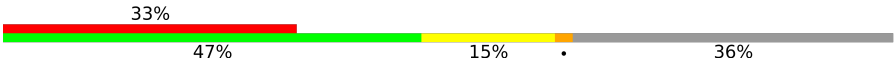
Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	D	876	7012	4530	1176	1272	34	0	0

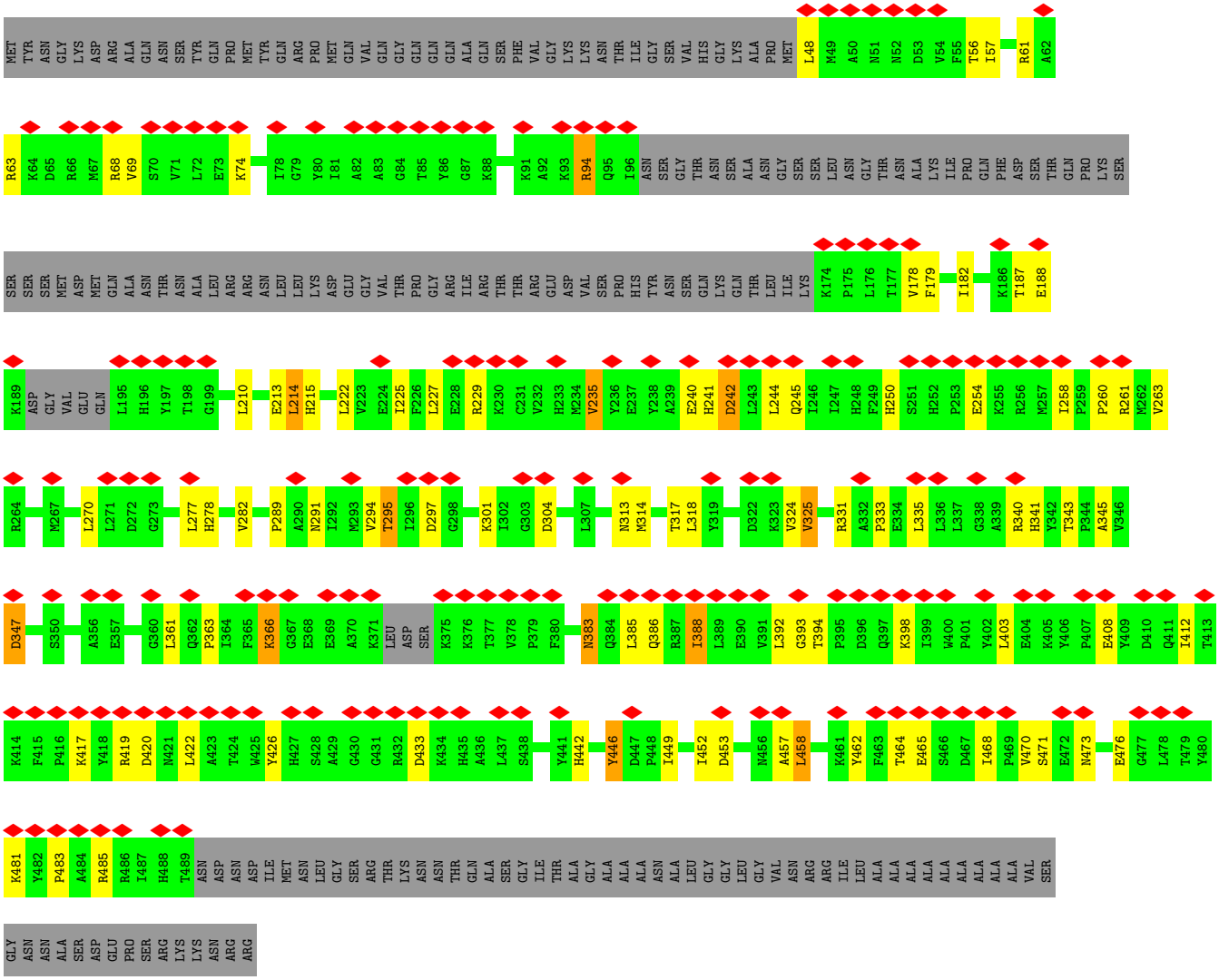
3 Residue-property plots (i)

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

• Molecule 1: Meiotic mRNA stability protein kinase SSN3

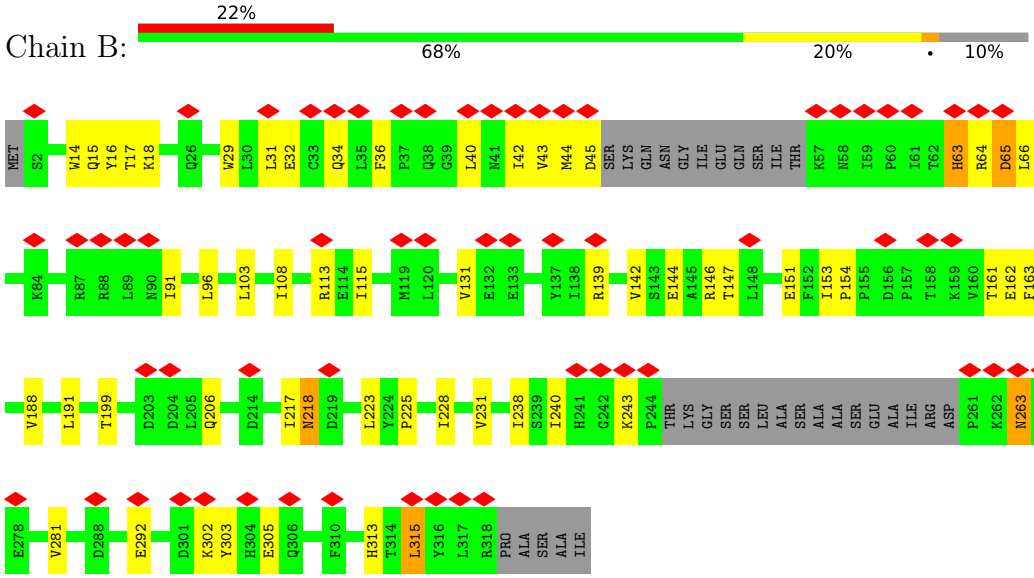
Chain A:





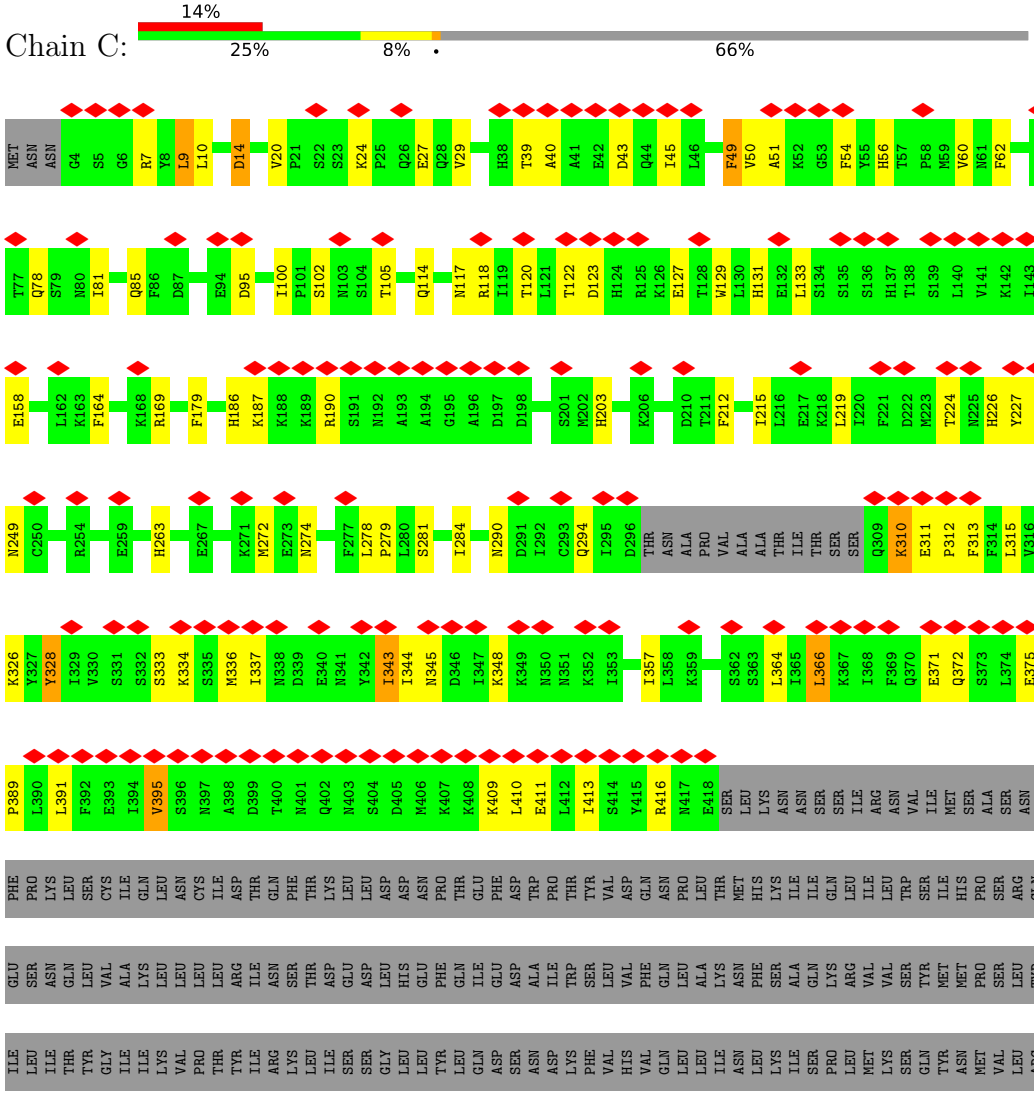
• Molecule 2: RNA polymerase II holoenzyme cyclin-like subunit

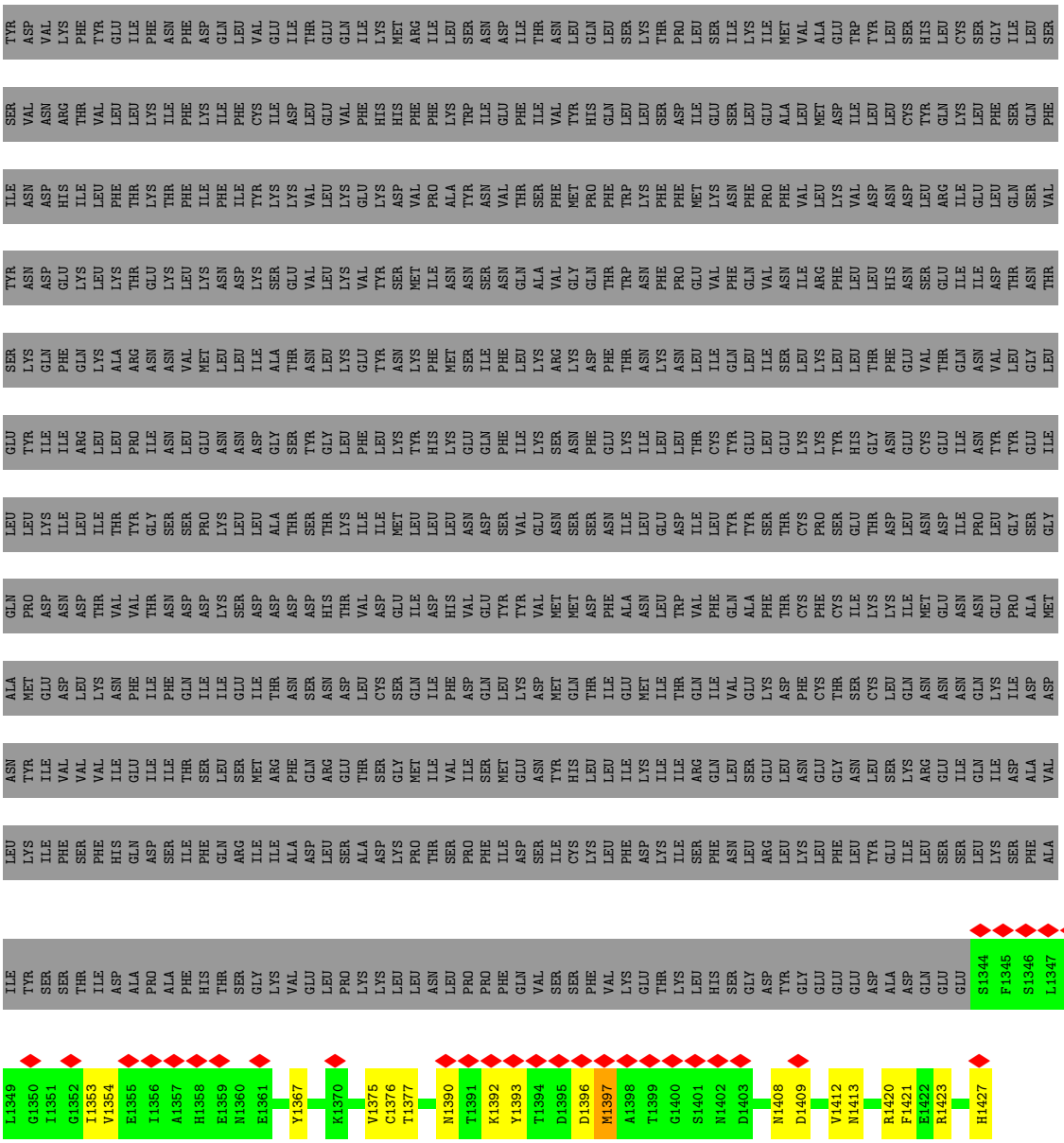
Chain B:



• Molecule 3: Mediator of RNA polymerase II transcription subunit 12

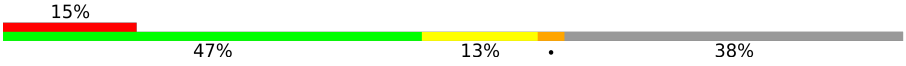
Chain C:

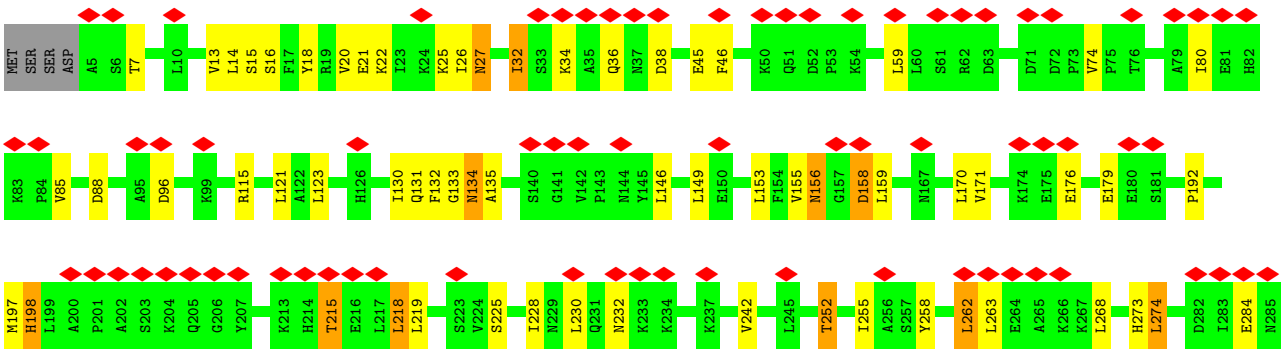


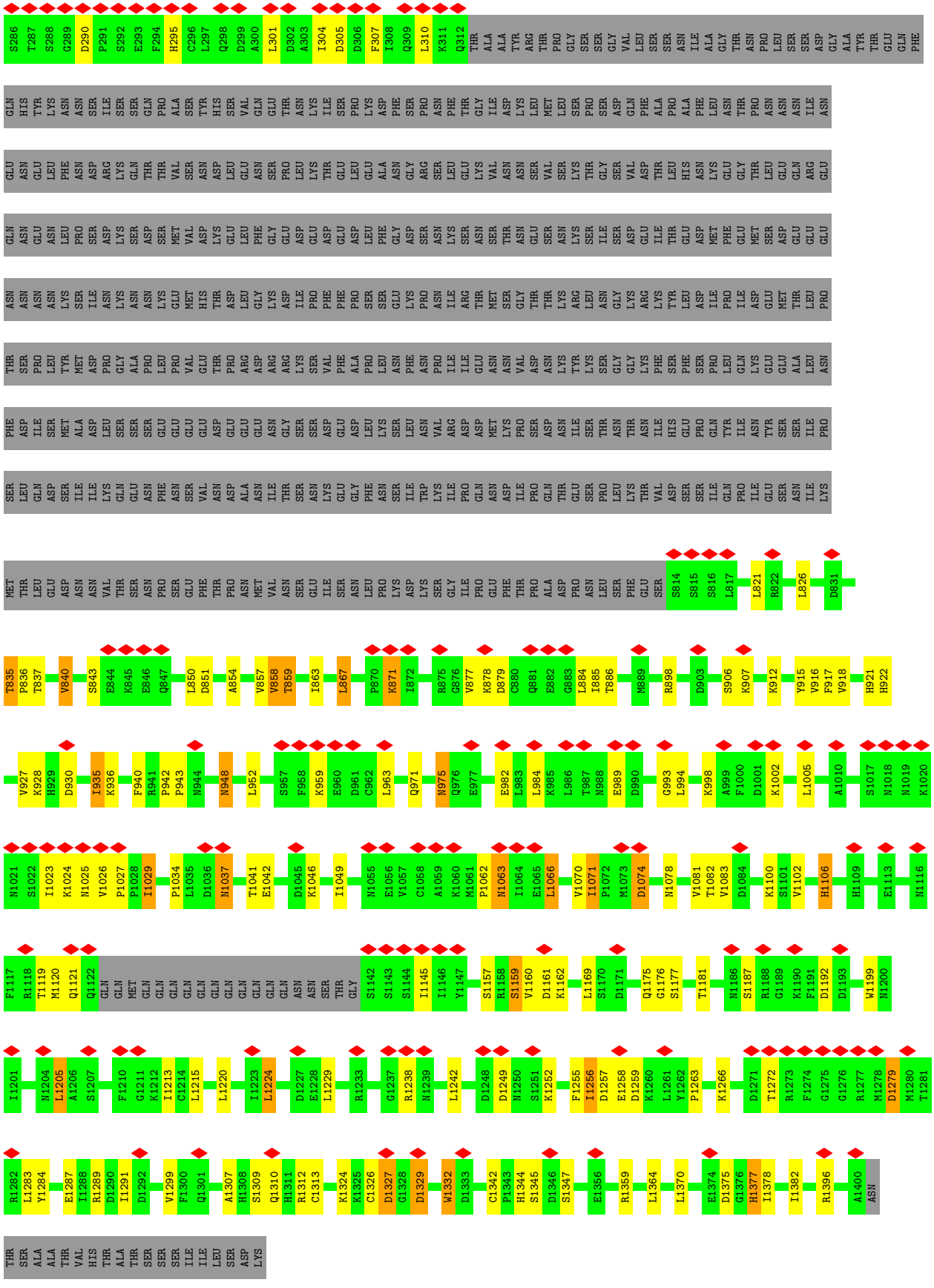


• Molecule 4: Mediator of RNA polymerase II transcription subunit 13

Chain D:






S286 T287 S288 G289 D290 P291 S292 E293 F294 H295 C296 L297 Q298 D299 A300 L301 D302 A303 I304 D305 D306 F307 I308 Q309 L310 K311 Q312 THR ALA ALA TYR ARG THR PRO GLY SER SER SER GLY VAL LEU SER SER ASN ILE ALA GLY THR ASN PRO LEU SER SER SER ASP GLY ALA TYR THR GLU GLN PHE
GLN HIS TYR LYS ASN ASN SER ILE SER SER GLN PRO ALA SER TYR HIS SER VAL GLN GLU THR ASN LYS ILE SER PRO LYS ASP PHE SER PRO ASN PHE THR GLY ILE ASP LYS LEU MET LEU SER PRO SER ASP GLN PHE ALA PRO ALA PHE LEU ASN THR ASN PRO ASN ASN ASN LEU ASN
GLU ASN GLU LEU PHE ASN ASP ARG LYS GLN THR THR VAL SER ASN ASP LEU GLU ASN SER LEU PRO LEU LYS THR GLU LEU GLU ALA ASN GLY ARG SER LEU GLU LYS VAL ASN ASN SER VAL SER LYS THR GLY SER VAL ASP THR LEU HIS ASN LYS GLU GLY THR LEU GLU GLN ARG GLU
GLN ASN GLU ASN LEU PRO SER ASP LYS SER ASP SER MET VAL ASP LYS GLU LEU PHE GLY GLU ASP LEU PHE GLY ASP SER ASN SER THR ASN GLU SER ASN LYS SER ILE SER ASP GLU ILE THR GLU ASP GLU ILE PHE GLY ASP SER ASN THR ASN LYS SER ASP GLU GLU GLU
ASN ASN ASN ASN LYS SER ILE ASN LYS ASN LYS GLU MET HIS THR ASP LEU GLY LYS ASP ILE PRO PHE PHE PRO SER SER GLU LYS PRO ASN ILE ARG THR MET SER GLY THR THR LYS ARG LEU ASN GLY LYS ARG LYS TYR LEU ASP ILE PRO ILE ASP GLU MET THR LEU PRO
THR SER PRO LEU TYR MET ASP PRO GLY ALA PRO PRO LEU PRO VAL GLU THR PRO ARG ASP ARG ARG LYS SER VAL PHE ALA PRO LEU ASN PHE ASN PRO ILE ILE GLU GLU ASN VAL ASP ASN LYS TYR LYS SER GLY GLY LYS PHE SER PHE SER PRO LEU GLN LYS GLU GLU ASN LEU
PHE ASP ILE SER MET ALA ASP LEU SER SER SER GLU GLU GLU ASP GLU GLU GLU GLU ASN GLY SER SER ASP GLU ASP ASN ILE SER THR ASN THR ASN ILE HIS GLU PRO GLN TYR ILE ASN TYR SER SER ILE PRO
SER LEU GLN ASP SER GLU GLN ASN ASP ALA ASN ILE THR SER ASN LYS GLU GLY PHE ASN SER ILE TRP LYS ILE PRO GLN ASN ASP ILE PRO GLN THR GLU SER PRO LEU LYS THR VAL ASP SER SER ILE GLU GLN PRO ILE GLU SER ASN LEU ASN
MET THR LEU GLU ASP ASN ASN VAL THR SER ASN PRO SER GLU PHE THR PRO ASN MET VAL ASN SER GLU ILE SER ASN LEU PRO LYS ASP LYS SER GLY ILE PRO GLU PHE THR PRO ALA ASP PRO ASN LEU SER PHE GLU SER S814 S815 S816 L817 L821 R822 L826 D831
T835 P836 T837 V840 S843 E844 K845 E846 Q847 L850 D851 A854 V857 V858 T859 I863 L867 P870 K871 I872 R875 G876 V877 K878 D879 C880 Q881 E882 G883 L884 I885 T886 M889 R898 D903 S906 K907 K912 Y915 V916 F917 V918 H921 H922
V927 K928 H929 D930 I935 K936 F940 R941 P942 P943 N944 N948 L952 S957 P958 K959 E960 D961 C962 L963 Q971 N975 Q976 E977 E982 L983 L984 K985 L986 T987 N988 E989 D990 G993 L994 K998 A999 F1000 D1001 K1002 L1005 A1010 S1017 N1018 N1019 K1020
N1021 S1022 I1023 K1024 N1025 V1026 P1027 P1028 I1029 P1034 L1035 D1036 N1037 T1041 E1042 D1045 K1046 I1049 N1055 E1056 V1057 C1058 A1059 K1060 M1061 P1062 N1063 I1064 E1065 L1066 V1070 I1071 P1072 M1073 D1074 N1078 V1081 T1082 V1083 D1084 K1100 S1101 V1102 H1106 H1109 E1113 N1116
F1117 R1118 T1119 M1120 Q1121 Q1122 GLN GLN MET GLN GLN GLN GLN GLN GLN GLN GLN GLN GLN ASN SER THR GLY S1142 S1143 S1144 I1145 I1146 Y1147 S1157 R1158 S1159 V1160 D1161 K1162 L1169 S1170 D1171 Q1175 G1176 S1177 T1181 N1186 S1187 R1188 G1189 K1190 F1191 D1192 D1193 W1199 N1200
I1201 N1204 L1205 A1206 S1207 F1210 G1211 K1212 I1213 C1214 L1215 L1220 I1223 L1224 D1227 E1228 L1229 R1233 G1237 R1238 N1239 L1242 D1248 D1249 N1250 S1251 K1252 F1255 I1256 D1257 E1258 D1259 K1260 L1261 Y1262 P1263 K1266 D1271 T1272 R1273 F1274 G1275 G1276 R1277 M1278 D1279 M1280 T1281
R1282 L1283 Y1284 E1287 I1288 R1289 D1290 I1291 D1292 V1299 F1300 Q1301 A1307 H1308 S1309 Q1310 H1311 R1312 C1313 K1324 K1325 C1326 D1327 G1328 D1329 W1332 D1333 C1342 P1343 H1344 S1345 D1346 S1347 E1356 R1359 L1364 L1370 E1374 D1375 G1376 H1377 I1378 I1382 R1396 A1400 ASN
THR SER ALA ALA THR VAL HIS THR ALA THR SER SER SER ILE ILE LEU SER ASP LYS

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	31534	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	65	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K2 QUANTUM (4k x 4k)	Depositor
Maximum map value	0.117	Depositor
Minimum map value	-0.059	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.003	Depositor
Recommended contour level	0.029	Depositor
Map size (Å)	410.88, 410.88, 410.88	wwPDB
Map dimensions	384, 384, 384	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.07, 1.07, 1.07	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	0.28	0/3030	0.53	0/4098
2	B	0.30	0/2505	0.49	0/3407
3	C	0.30	0/4155	0.50	0/5619
4	D	0.30	0/7183	0.55	0/9753
All	All	0.29	0/16873	0.53	0/22877

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	2952	0	2987	39	0
2	B	2436	0	2430	27	0
3	C	4049	0	4021	64	0
4	D	7012	0	7104	90	0
All	All	16449	0	16542	208	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 6.

All (208) 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:C:102:SER:CB	3:C:1413:ASN:HD21	1.60	1.13
3:C:102:SER:HB2	3:C:1413:ASN:HD21	1.05	1.09
3:C:311:GLU:CG	3:C:312:PRO:HD3	1.88	1.03
3:C:311:GLU:HG3	3:C:312:PRO:CD	1.88	1.02
3:C:311:GLU:HG3	3:C:312:PRO:HD3	0.99	0.98
3:C:100:ILE:CG2	3:C:1408:ASN:HD21	1.80	0.95
3:C:102:SER:HB2	3:C:1413:ASN:ND2	1.84	0.92
3:C:1413:ASN:HD22	4:D:1284:TYR:HE2	1.15	0.92
3:C:334:LYS:HD3	3:C:345:ASN:HD22	1.36	0.89
3:C:310:LYS:H	3:C:310:LYS:CE	1.88	0.86
3:C:102:SER:CB	3:C:1413:ASN:ND2	2.41	0.81
3:C:310:LYS:H	3:C:310:LYS:HE2	1.47	0.79
3:C:334:LYS:HD3	3:C:345:ASN:ND2	1.99	0.77
2:B:65:ASP:N	2:B:65:ASP:OD1	2.19	0.73
3:C:100:ILE:CG2	3:C:1408:ASN:ND2	2.51	0.73
4:D:198:HIS:HE1	4:D:262:LEU:HD11	1.54	0.72
3:C:100:ILE:HG23	3:C:1408:ASN:HD21	1.55	0.71
4:D:198:HIS:CE1	4:D:262:LEU:HD11	2.27	0.69
3:C:102:SER:HB3	3:C:1413:ASN:HD21	1.52	0.69
3:C:311:GLU:OE2	3:C:312:PRO:HG3	1.93	0.69
4:D:198:HIS:CE1	4:D:262:LEU:CD1	2.76	0.69
2:B:66:LEU:O	2:B:67:HIS:ND1	2.27	0.68
4:D:198:HIS:HE1	4:D:262:LEU:CD1	2.08	0.67
4:D:262:LEU:N	4:D:262:LEU:HD13	2.09	0.67
2:B:63:HIS:CE1	2:B:66:LEU:HB2	2.29	0.67
4:D:1024:LYS:O	4:D:1027:PRO:HD2	1.94	0.66
1:A:363:PRO:HG2	1:A:366:LYS:HB3	1.76	0.65
2:B:66:LEU:O	2:B:67:HIS:CG	2.49	0.65
3:C:1413:ASN:ND2	4:D:1284:TYR:HE2	1.90	0.65
3:C:311:GLU:CG	3:C:312:PRO:CD	2.64	0.63
4:D:262:LEU:HD13	4:D:262:LEU:H	1.63	0.62
4:D:290:ASP:HB2	4:D:295:HIS:HB2	1.82	0.61
3:C:14:ASP:N	3:C:14:ASP:OD1	2.33	0.61
3:C:310:LYS:H	3:C:310:LYS:HE3	1.65	0.61
3:C:343:ILE:O	3:C:343:ILE:HG13	1.99	0.60
3:C:315:LEU:O	3:C:319:ILE:HB	2.02	0.60
3:C:100:ILE:HG21	3:C:1408:ASN:OD1	2.02	0.60
1:A:245:GLN:NE2	1:A:483:PRO:O	2.35	0.59
2:B:78:CYS:HA	2:B:81:LEU:HD23	1.84	0.59
4:D:156:ASN:OD1	4:D:156:ASN:N	2.34	0.59
4:D:262:LEU:HD22	4:D:262:LEU:C	2.22	0.59
4:D:1255:PHE:HB2	4:D:1332:TRP:HE1	1.67	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:96:ASP:N	4:D:96:ASP:OD1	2.37	0.58
4:D:1005:LEU:HD21	4:D:1049:ILE:HG23	1.86	0.57
4:D:1037:ASN:N	4:D:1037:ASN:OD1	2.35	0.57
4:D:1062:PRO:O	4:D:1063:ASN:ND2	2.38	0.57
3:C:45:ILE:O	3:C:49:PHE:HB2	2.03	0.57
1:A:343:THR:HG23	1:A:345:ALA:H	1.70	0.57
4:D:1342:CYS:HG	4:D:1347:SER:HG	1.51	0.56
4:D:948:ASN:N	4:D:948:ASN:OD1	2.38	0.56
4:D:262:LEU:HD22	4:D:262:LEU:O	2.06	0.55
4:D:14:LEU:HB3	4:D:898:ARG:HH21	1.72	0.55
3:C:102:SER:HB3	3:C:1413:ASN:ND2	2.17	0.55
4:D:1287:GLU:OE2	4:D:1289:ARG:NH2	2.40	0.54
4:D:1344:HIS:ND1	4:D:1345:SER:O	2.40	0.54
3:C:279:PRO:HG3	3:C:357:ILE:HD11	1.89	0.54
2:B:146:ARG:HD3	2:B:153:ILE:HG23	1.89	0.54
3:C:133:LEU:O	3:C:169:ARG:NH1	2.41	0.54
1:A:297:ASP:OD1	1:A:473:ASN:ND2	2.41	0.54
4:D:27:ASN:N	4:D:27:ASN:OD1	2.40	0.54
4:D:1029:ILE:O	4:D:1066:LEU:HA	2.08	0.53
1:A:383:ASN:OD1	1:A:383:ASN:N	2.40	0.53
4:D:146:LEU:HD21	4:D:170:LEU:HD12	1.89	0.53
3:C:310:LYS:HE2	3:C:310:LYS:N	2.20	0.53
4:D:18:TYR:HA	4:D:898:ARG:HA	1.90	0.53
2:B:63:HIS:ND1	2:B:66:LEU:HB2	2.24	0.53
3:C:1420:ARG:NH1	4:D:915:TYR:OH	2.42	0.53
4:D:215:THR:O	4:D:218:LEU:HB3	2.09	0.53
4:D:837:THR:OG1	4:D:1396:ARG:NH1	2.42	0.52
4:D:1042:GLU:OE1	4:D:1046:LYS:NZ	2.42	0.52
3:C:1393:TYR:OH	3:C:1397:MET:SD	2.68	0.52
4:D:1074:ASP:N	4:D:1074:ASP:OD1	2.43	0.52
1:A:56:THR:OG1	1:A:57:ILE:N	2.37	0.52
3:C:333:SER:OG	3:C:334:LYS:N	2.43	0.52
1:A:222:LEU:HD21	1:A:225:ILE:HD11	1.92	0.51
3:C:409:LYS:HG3	3:C:413:ILE:HD13	1.91	0.51
4:D:1159:SER:OG	4:D:1161:ASP:OD1	2.29	0.51
4:D:1326:CYS:SG	4:D:1327:ASP:N	2.83	0.51
3:C:123:ASP:O	3:C:127:GLU:HB3	2.11	0.51
4:D:854:ALA:O	4:D:858:VAL:HB	2.11	0.51
4:D:198:HIS:CE1	4:D:262:LEU:HD13	2.46	0.50
4:D:928:LYS:NZ	4:D:930:ASP:OD2	2.43	0.50
1:A:244:LEU:HG	1:A:289:PRO:HB2	1.94	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:1034:PRO:HA	4:D:1071:ILE:O	2.12	0.50
2:B:206:GLN:NE2	3:C:62:PHE:O	2.44	0.50
3:C:1413:ASN:ND2	4:D:1284:TYR:CE2	2.74	0.50
4:D:1106:HIS:ND1	4:D:1175:GLN:OE1	2.45	0.49
1:A:61:ARG:NH2	2:B:162:GLU:OE1	2.45	0.49
4:D:192:PRO:HD3	4:D:274:LEU:HD12	1.94	0.49
4:D:1026:VAL:N	4:D:1027:PRO:CD	2.75	0.49
3:C:1376:CYS:SG	3:C:1377:THR:N	2.85	0.49
4:D:1375:ASP:N	4:D:1375:ASP:OD1	2.44	0.49
3:C:375:GLU:O	3:C:409:LYS:NZ	2.46	0.49
4:D:1279:ASP:N	4:D:1279:ASP:OD1	2.45	0.49
1:A:347:ASP:N	1:A:347:ASP:OD1	2.44	0.49
2:B:217:ILE:O	2:B:218:ASN:ND2	2.27	0.49
3:C:272:MET:O	3:C:326:LYS:NZ	2.44	0.48
1:A:68:ARG:NH1	1:A:227:LEU:O	2.45	0.48
4:D:1029:ILE:HG12	4:D:1066:LEU:HB3	1.94	0.48
1:A:242:ASP:OD1	1:A:245:GLN:N	2.46	0.48
1:A:74:LYS:HG3	1:A:94:ARG:HH22	1.78	0.48
4:D:115:ARG:NH1	4:D:225:SER:OG	2.40	0.47
4:D:921:HIS:O	4:D:922:HIS:ND1	2.47	0.47
4:D:301:LEU:HA	4:D:304:ILE:HG22	1.95	0.47
4:D:1220:LEU:HD21	4:D:1382:ILE:HG23	1.96	0.47
4:D:1377:HIS:CE1	4:D:1378:ILE:HG13	2.50	0.47
2:B:225:PRO:HD2	2:B:228:ILE:HD12	1.97	0.47
2:B:263:ASN:N	2:B:263:ASN:OD1	2.47	0.47
4:D:1176:GLY:HA3	4:D:1205:LEU:HD11	1.96	0.47
1:A:449:ILE:HD12	3:C:43:ASP:HB2	1.97	0.47
2:B:17:THR:OG1	2:B:18:LYS:N	2.48	0.47
2:B:144:GLU:HA	2:B:147:THR:HG22	1.97	0.47
3:C:117:ASN:N	3:C:117:ASN:OD1	2.47	0.46
4:D:1258:GLU:HG3	4:D:1329:ASP:HB3	1.97	0.46
4:D:14:LEU:HD22	4:D:898:ARG:HD2	1.98	0.46
4:D:132:PHE:HB3	4:D:135:ALA:HB3	1.97	0.46
4:D:859:THR:O	4:D:859:THR:OG1	2.34	0.46
3:C:311:GLU:N	3:C:312:PRO:CD	2.78	0.46
4:D:262:LEU:CD2	4:D:263:LEU:O	2.63	0.46
4:D:131:GLN:HG2	4:D:133:GLY:H	1.81	0.46
4:D:262:LEU:CD1	4:D:262:LEU:N	2.76	0.46
1:A:182:ILE:HG12	1:A:235:VAL:HG12	1.98	0.45
3:C:1354:VAL:HG23	4:D:878:LYS:HE2	1.98	0.45
2:B:243:LYS:HG3	3:C:81:ILE:HG21	1.98	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:1078:ASN:HB3	4:D:1081:VAL:HG23	1.98	0.45
4:D:936:LYS:HA	4:D:936:LYS:HD2	1.84	0.45
4:D:942:PRO:HA	4:D:943:PRO:HD3	1.86	0.45
1:A:260:PRO:HA	1:A:263:VAL:HG12	1.97	0.45
1:A:325:VAL:HG21	1:A:335:LEU:HD22	1.98	0.45
3:C:1409:ASP:OD1	3:C:1409:ASP:N	2.43	0.45
1:A:291:ASN:OD1	1:A:291:ASN:N	2.49	0.45
1:A:442:HIS:HB3	1:A:452:ILE:HG21	1.99	0.45
2:B:68:TYR:HB3	2:B:113:ARG:HH22	1.82	0.45
4:D:15:SER:OG	4:D:16:SER:N	2.50	0.45
4:D:158:ASP:OD1	4:D:158:ASP:N	2.49	0.45
2:B:15:GLN:NE2	2:B:223:LEU:O	2.49	0.45
3:C:311:GLU:CD	3:C:312:PRO:N	2.70	0.45
3:C:313:PHE:CD1	3:C:313:PHE:O	2.70	0.45
3:C:376:VAL:HG12	3:C:378:ILE:HG22	1.99	0.45
4:D:1224:LEU:O	4:D:1312:ARG:NH1	2.50	0.44
1:A:313:ASN:OD1	1:A:313:ASN:N	2.50	0.44
2:B:31:LEU:O	2:B:34:GLN:NE2	2.50	0.44
3:C:39:THR:OG1	3:C:40:ALA:N	2.49	0.44
2:B:161:THR:HA	2:B:164:GLU:HB3	2.00	0.44
4:D:134:ASN:N	4:D:134:ASN:OD1	2.50	0.44
4:D:262:LEU:C	4:D:262:LEU:CD2	2.86	0.44
1:A:240:GLU:HB2	1:A:295:THR:HA	2.00	0.44
1:A:333:PRO:HG2	1:A:446:TYR:HB3	2.00	0.43
4:D:1252:LYS:HD3	4:D:1307:ALA:HB1	1.99	0.43
2:B:238:ILE:HD13	2:B:238:ILE:HA	1.90	0.43
3:C:100:ILE:HG22	3:C:1408:ASN:HD21	1.75	0.43
4:D:971:GLN:O	4:D:975:ASN:HB2	2.18	0.43
4:D:252:THR:HG21	4:D:1160:VAL:HG12	2.01	0.43
4:D:835:THR:HG23	4:D:836:PRO:HD3	2.01	0.43
3:C:244:LEU:HD21	3:C:284:ILE:HD11	2.00	0.43
4:D:1169:LEU:O	4:D:1177:SER:HA	2.19	0.43
1:A:471:SER:OG	1:A:473:ASN:O	2.36	0.43
2:B:40:LEU:HD13	2:B:315:LEU:HD23	2.00	0.43
4:D:907:LYS:HB3	4:D:1299:VAL:HB	2.00	0.43
1:A:393:GLY:O	1:A:446:TYR:OH	2.31	0.43
1:A:452:ILE:HG12	1:A:457:ALA:HB2	2.01	0.43
2:B:32:GLU:OE1	2:B:64:ARG:HD2	2.19	0.43
1:A:250:HIS:HB3	1:A:361:LEU:HD21	2.00	0.42
3:C:328:TYR:HD1	3:C:328:TYR:HA	1.78	0.42
1:A:242:ASP:OD2	1:A:485:ARG:NH2	2.53	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:317:THR:OG1	1:A:318:LEU:N	2.52	0.42
1:A:341:HIS:CD2	3:C:54:PHE:HB3	2.54	0.42
3:C:154:ARG:O	3:C:158:GLU:HB2	2.19	0.42
2:B:240:ILE:HD11	3:C:78:GLN:HB3	2.01	0.42
4:D:14:LEU:HB2	4:D:1256:ILE:HG23	2.01	0.42
1:A:426:TYR:HE2	1:A:433:ASP:HA	1.84	0.42
3:C:409:LYS:HD2	3:C:409:LYS:HA	1.84	0.42
4:D:871:LYS:HE2	4:D:871:LYS:HB2	1.75	0.42
2:B:153:ILE:HD12	2:B:154:PRO:HD2	2.02	0.42
4:D:1157:SER:HB2	4:D:1220:LEU:HB2	2.02	0.42
4:D:1257:ASP:OD2	4:D:1266:LYS:NZ	2.53	0.42
1:A:340:ARG:HG3	3:C:51:ALA:HA	2.01	0.41
4:D:984:LEU:O	4:D:993:GLY:N	2.49	0.41
1:A:394:THR:HG21	1:A:417:LYS:HG3	2.02	0.41
2:B:115:ILE:HD13	2:B:115:ILE:HA	1.88	0.41
1:A:458:LEU:HD12	1:A:458:LEU:HA	1.87	0.41
2:B:108:ILE:HD13	2:B:108:ILE:HA	1.88	0.41
3:C:114:GLN:NE2	3:C:1390:ASN:OD1	2.43	0.41
3:C:152:LYS:HG3	3:C:155:GLN:HB2	2.03	0.41
4:D:840:VAL:HG11	4:D:850:LEU:HD21	2.01	0.41
1:A:385:LEU:HD12	1:A:385:LEU:HA	1.92	0.41
4:D:1192:ASP:N	4:D:1192:ASP:OD1	2.54	0.41
1:A:74:LYS:O	1:A:94:ARG:NH2	2.52	0.41
2:B:70:LYS:HD2	2:B:70:LYS:HA	1.74	0.41
3:C:372:GLN:HG2	3:C:375:GLU:H	1.86	0.41
4:D:32:ILE:N	4:D:88:ASP:OD2	2.51	0.41
3:C:9:LEU:HD22	3:C:9:LEU:HA	1.82	0.41
4:D:867:LEU:H	4:D:867:LEU:HG	1.58	0.41
1:A:277:LEU:HD12	1:A:277:LEU:HA	1.94	0.41
1:A:291:ASN:HD22	1:A:304:ASP:HB3	1.86	0.41
1:A:385:LEU:HA	1:A:388:ILE:HG22	2.02	0.41
3:C:366:LEU:HD21	3:C:395:VAL:HG11	2.02	0.41
3:C:386:ILE:HG13	3:C:389:PRO:HD2	2.03	0.41
4:D:821:LEU:HD13	4:D:821:LEU:HA	1.93	0.41
4:D:935:ILE:HG12	4:D:940:PHE:HB2	2.02	0.41
4:D:984:LEU:HD12	4:D:984:LEU:HA	1.91	0.41
4:D:851:ASP:N	4:D:851:ASP:OD1	2.54	0.41
4:D:1121:GLN:H	4:D:1121:GLN:HG2	1.66	0.41
4:D:1309:SER:O	4:D:1309:SER:OG	2.33	0.40
4:D:21:GLU:HB3	4:D:159:LEU:HB3	2.03	0.40
1:A:214:LEU:HD12	1:A:214:LEU:HA	1.96	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:123:LEU:HD23	4:D:123:LEU:HA	1.88	0.40
3:C:105:THR:OG1	3:C:105:THR:O	2.40	0.40

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	349/555 (63%)	308 (88%)	41 (12%)	0	100	100
2	B	284/323 (88%)	259 (91%)	25 (9%)	0	100	100
3	C	481/1427 (34%)	448 (93%)	33 (7%)	0	100	100
4	D	870/1420 (61%)	782 (90%)	88 (10%)	0	100	100
All	All	1984/3725 (53%)	1797 (91%)	187 (9%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	317/474 (67%)	265 (84%)	52 (16%)	2	15
2	B	274/299 (92%)	235 (86%)	39 (14%)	3	21
3	C	460/1357 (34%)	383 (83%)	77 (17%)	2	15

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
4	D	793/1300 (61%)	665 (84%)	128 (16%)	2 16
All	All	1844/3430 (54%)	1548 (84%)	296 (16%)	5 16

All (296) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	48	LEU
1	A	63	ARG
1	A	69	VAL
1	A	94	ARG
1	A	178	VAL
1	A	179	PHE
1	A	187	THR
1	A	188	GLU
1	A	210	LEU
1	A	213	GLU
1	A	214	LEU
1	A	215	HIS
1	A	229	ARG
1	A	235	VAL
1	A	241	HIS
1	A	242	ASP
1	A	254	GLU
1	A	258	ILE
1	A	261	ARG
1	A	270	LEU
1	A	278	HIS
1	A	282	VAL
1	A	294	VAL
1	A	295	THR
1	A	301	LYS
1	A	314	MET
1	A	324	VAL
1	A	325	VAL
1	A	331	ARG
1	A	347	ASP
1	A	366	LYS
1	A	383	ASN
1	A	386	GLN
1	A	388	ILE
1	A	392	LEU
1	A	398	LYS

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Mol	Chain	Res	Type
1	A	403	LEU
1	A	408	GLU
1	A	412	ILE
1	A	419	ARG
1	A	420	ASP
1	A	422	LEU
1	A	446	TYR
1	A	453	ASP
1	A	458	LEU
1	A	462	TYR
1	A	464	THR
1	A	465	GLU
1	A	468	ILE
1	A	470	VAL
1	A	476	GLU
1	A	481	LYS
2	B	14	TRP
2	B	16	TYR
2	B	29	TRP
2	B	36	PHE
2	B	42	ILE
2	B	43	VAL
2	B	44	MET
2	B	45	ASP
2	B	63	HIS
2	B	65	ASP
2	B	68	TYR
2	B	80	PHE
2	B	81	LEU
2	B	91	ILE
2	B	96	LEU
2	B	103	LEU
2	B	131	VAL
2	B	139	ARG
2	B	142	VAL
2	B	151	GLU
2	B	163	PHE
2	B	168	LEU
2	B	171	LEU
2	B	177	VAL
2	B	188	VAL
2	B	191	LEU

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Mol	Chain	Res	Type
2	B	199	THR
2	B	218	ASN
2	B	231	VAL
2	B	263	ASN
2	B	269	GLN
2	B	274	ARG
2	B	281	VAL
2	B	292	GLU
2	B	302	LYS
2	B	303	TYR
2	B	305	GLU
2	B	313	HIS
2	B	315	LEU
3	C	7	ARG
3	C	9	LEU
3	C	10	LEU
3	C	14	ASP
3	C	20	VAL
3	C	24	LYS
3	C	27	GLU
3	C	29	VAL
3	C	49	PHE
3	C	50	VAL
3	C	56	HIS
3	C	60	VAL
3	C	72	HIS
3	C	73	GLU
3	C	85	GLN
3	C	95	ASP
3	C	118	ARG
3	C	120	THR
3	C	122	THR
3	C	129	TRP
3	C	131	HIS
3	C	149	HIS
3	C	153	ARG
3	C	164	PHE
3	C	179	PHE
3	C	186	HIS
3	C	187	LYS
3	C	190	ARG
3	C	203	HIS

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Mol	Chain	Res	Type
3	C	212	PHE
3	C	215	ILE
3	C	219	LEU
3	C	224	THR
3	C	226	HIS
3	C	227	TYR
3	C	228	ASN
3	C	232	GLN
3	C	244	LEU
3	C	249	ASN
3	C	263	HIS
3	C	274	ASN
3	C	278	LEU
3	C	281	SER
3	C	290	ASN
3	C	294	GLN
3	C	310	LYS
3	C	317	THR
3	C	319	ILE
3	C	323	LEU
3	C	328	TYR
3	C	336	MET
3	C	337	ILE
3	C	343	ILE
3	C	344	ILE
3	C	348	LYS
3	C	364	LEU
3	C	366	LEU
3	C	371	GLU
3	C	376	VAL
3	C	378	ILE
3	C	381	THR
3	C	387	TYR
3	C	391	LEU
3	C	395	VAL
3	C	410	LEU
3	C	411	GLU
3	C	416	ARG
3	C	1353	ILE
3	C	1367	TYR
3	C	1375	VAL
3	C	1392	LYS

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Mol	Chain	Res	Type
3	C	1396	ASP
3	C	1397	MET
3	C	1412	VAL
3	C	1421	PHE
3	C	1423	ARG
3	C	1427	HIS
4	D	7	THR
4	D	13	VAL
4	D	20	VAL
4	D	22	LYS
4	D	25	LYS
4	D	26	ILE
4	D	27	ASN
4	D	32	ILE
4	D	34	LYS
4	D	36	GLN
4	D	38	ASP
4	D	45	GLU
4	D	46	PHE
4	D	59	LEU
4	D	74	VAL
4	D	80	ILE
4	D	85	VAL
4	D	121	LEU
4	D	130	ILE
4	D	134	ASN
4	D	149	LEU
4	D	153	LEU
4	D	155	VAL
4	D	156	ASN
4	D	158	ASP
4	D	171	VAL
4	D	176	GLU
4	D	179	GLU
4	D	197	MET
4	D	198	HIS
4	D	215	THR
4	D	218	LEU
4	D	219	LEU
4	D	228	ILE
4	D	230	LEU
4	D	232	ASN

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Mol	Chain	Res	Type
4	D	242	VAL
4	D	252	THR
4	D	255	ILE
4	D	258	TYR
4	D	262	LEU
4	D	268	LEU
4	D	273	HIS
4	D	274	LEU
4	D	284	GLU
4	D	305	ASP
4	D	307	PHE
4	D	310	LEU
4	D	826	LEU
4	D	835	THR
4	D	840	VAL
4	D	843	SER
4	D	857	VAL
4	D	858	VAL
4	D	859	THR
4	D	863	ILE
4	D	867	LEU
4	D	871	LYS
4	D	877	VAL
4	D	879	ASP
4	D	884	LEU
4	D	885	ILE
4	D	886	THR
4	D	906	SER
4	D	912	LYS
4	D	916	VAL
4	D	917	PHE
4	D	918	VAL
4	D	927	VAL
4	D	935	ILE
4	D	948	ASN
4	D	952	LEU
4	D	959	LYS
4	D	963	LEU
4	D	975	ASN
4	D	982	GLU
4	D	989	GLU
4	D	994	LEU

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Mol	Chain	Res	Type
4	D	998	LYS
4	D	1002	LYS
4	D	1023	ILE
4	D	1025	ASN
4	D	1029	ILE
4	D	1037	ASN
4	D	1041	THR
4	D	1063	ASN
4	D	1066	LEU
4	D	1070	VAL
4	D	1071	ILE
4	D	1074	ASP
4	D	1082	THR
4	D	1083	VAL
4	D	1100	LYS
4	D	1102	VAL
4	D	1106	HIS
4	D	1119	THR
4	D	1120	MET
4	D	1145	ILE
4	D	1159	SER
4	D	1162	LYS
4	D	1181	THR
4	D	1187	SER
4	D	1199	TRP
4	D	1205	LEU
4	D	1213	ILE
4	D	1215	LEU
4	D	1224	LEU
4	D	1229	LEU
4	D	1238	ARG
4	D	1242	LEU
4	D	1249	ASP
4	D	1256	ILE
4	D	1259	ASP
4	D	1263	PRO
4	D	1272	THR
4	D	1279	ASP
4	D	1283	LEU
4	D	1291	ILE
4	D	1310	GLN
4	D	1313	CYS

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Mol	Chain	Res	Type
4	D	1324	LYS
4	D	1327	ASP
4	D	1329	ASP
4	D	1332	TRP
4	D	1359	ARG
4	D	1364	LEU
4	D	1370	LEU
4	D	1377	HIS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
2	B	63	HIS
3	C	345	ASN
3	C	1413	ASN
4	D	177	ASN
4	D	198	HIS

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

There are no ligands in this entry.

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

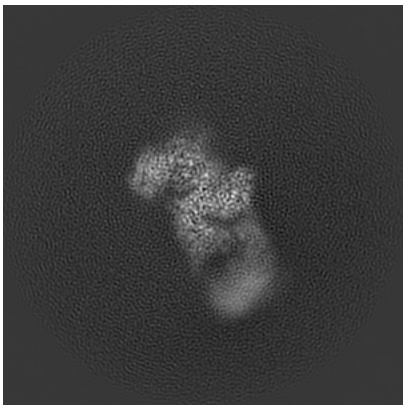
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-22989. These allow visual inspection of the internal detail of the map and identification of artifacts.

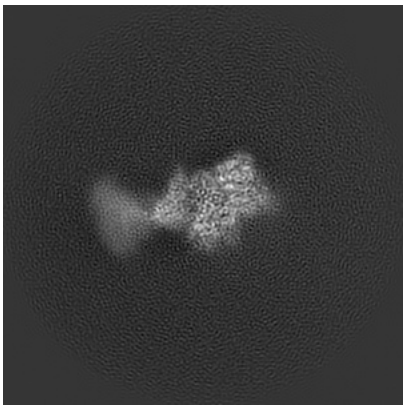
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

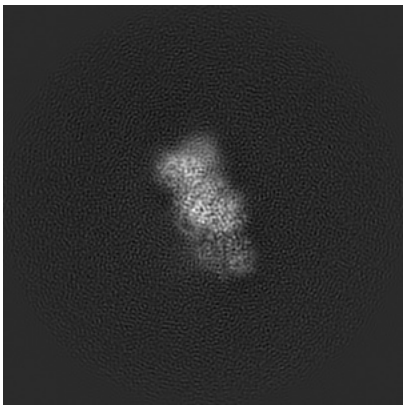
6.1.1 Primary map



X

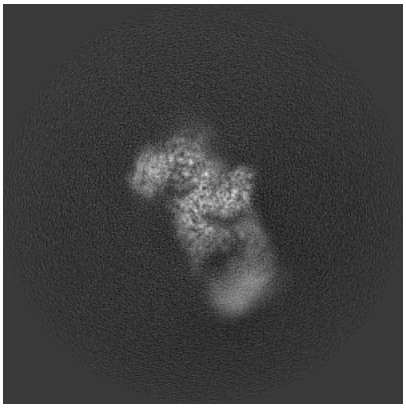


Y

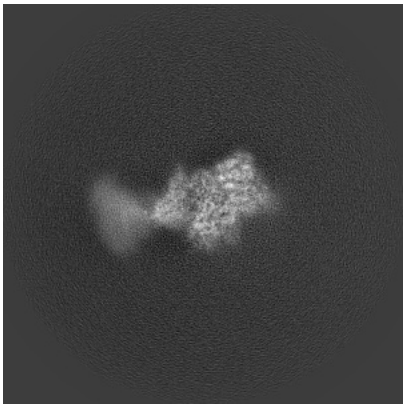


Z

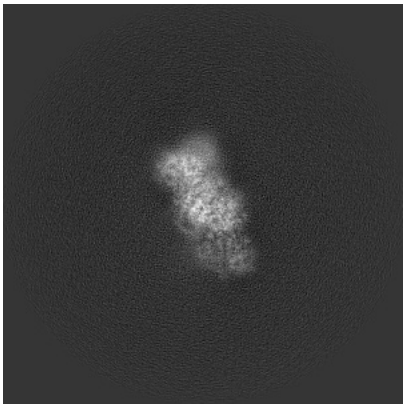
6.1.2 Raw map



X



Y

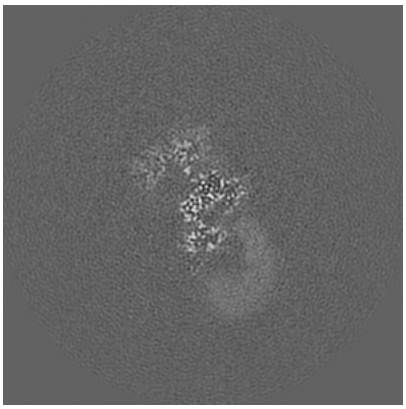


Z

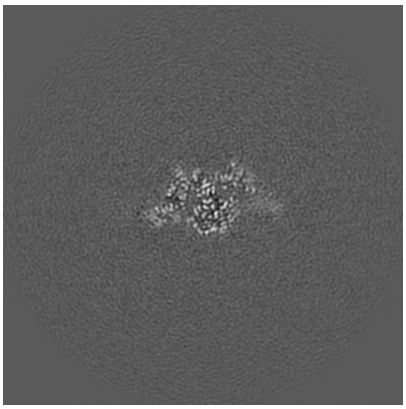
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

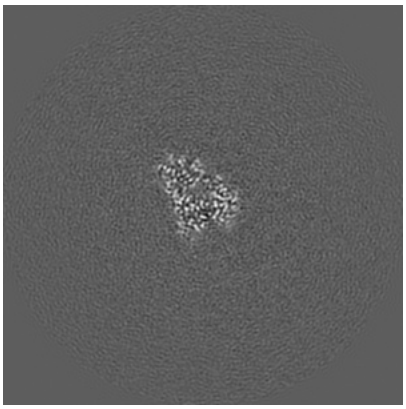
6.2.1 Primary map



X Index: 192

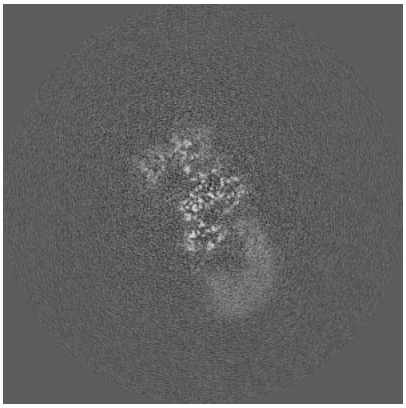


Y Index: 192

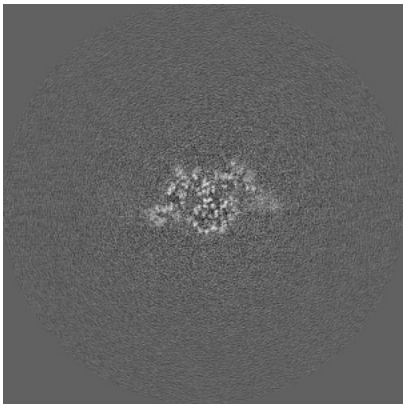


Z Index: 192

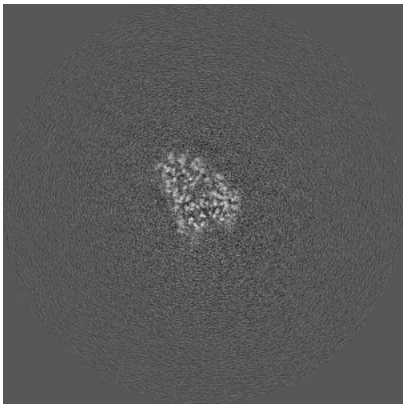
6.2.2 Raw map



X Index: 192



Y Index: 192

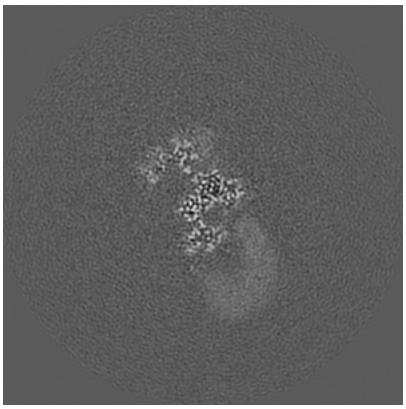


Z Index: 192

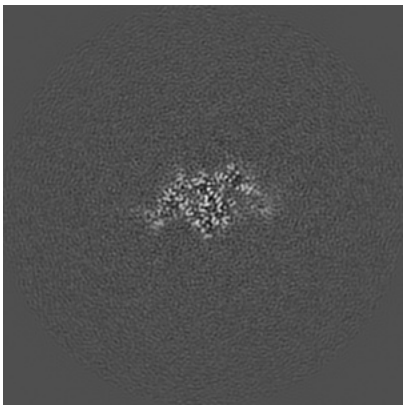
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

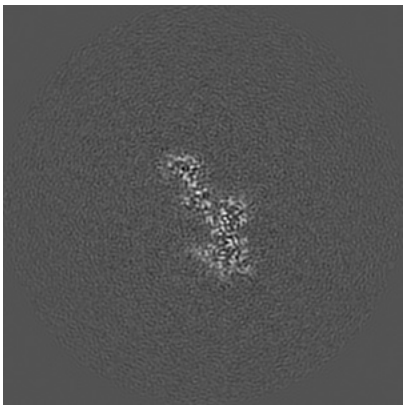
6.3.1 Primary map



X Index: 193

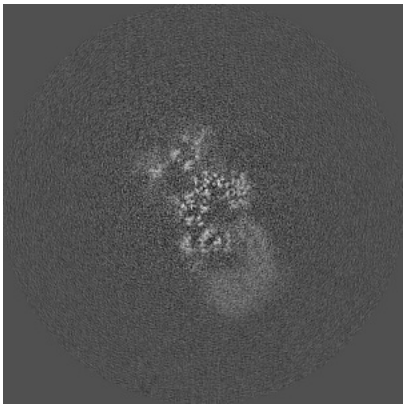


Y Index: 189

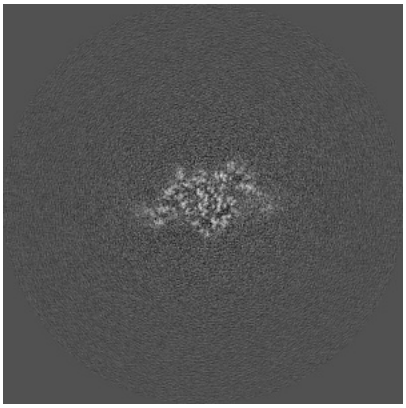


Z Index: 219

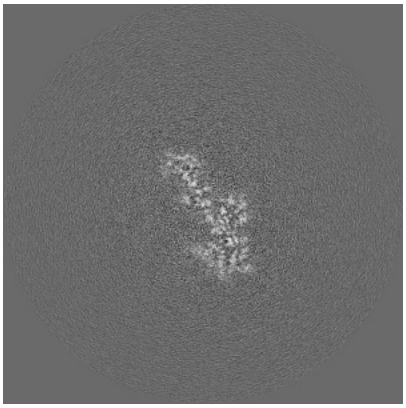
6.3.2 Raw map



X Index: 188



Y Index: 190

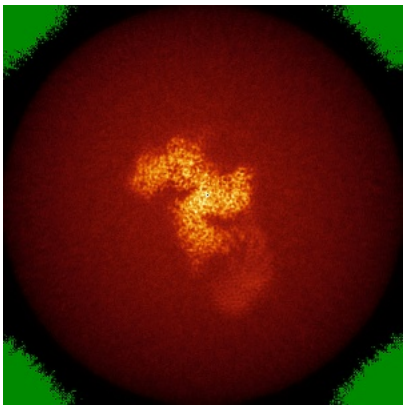


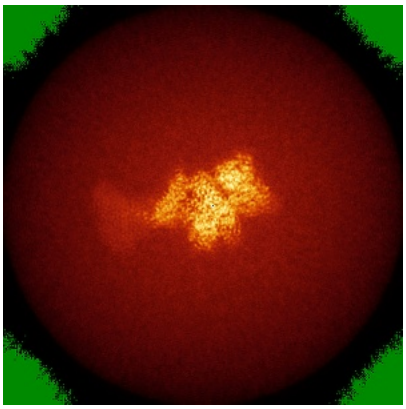
Z Index: 219

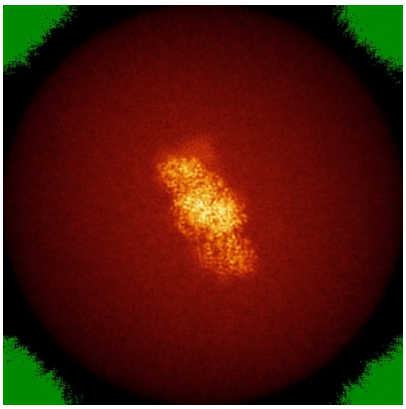
The images above show the largest variance slices of the map in three orthogonal directions.

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

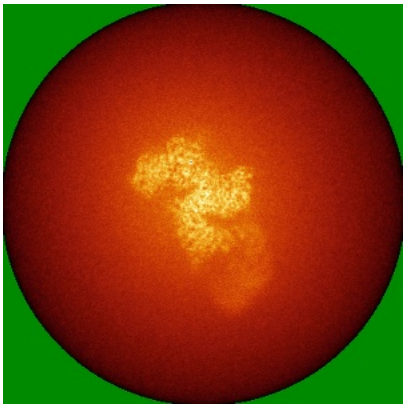
6.4.1 Primary map

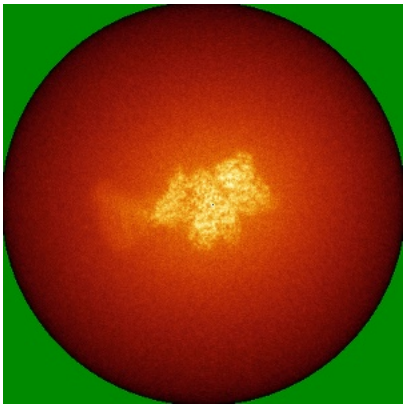

X

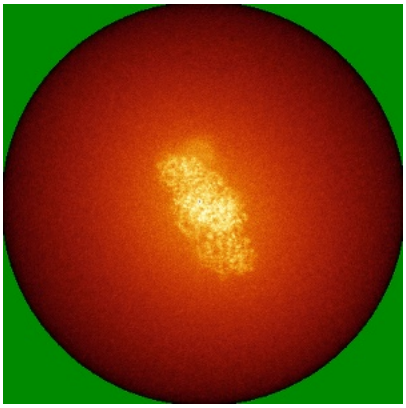

Y


Z

6.4.2 Raw map


X


Y


Z

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

6.5 Orthogonal surface views (i)

6.5.1 Primary map

X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.029. 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.

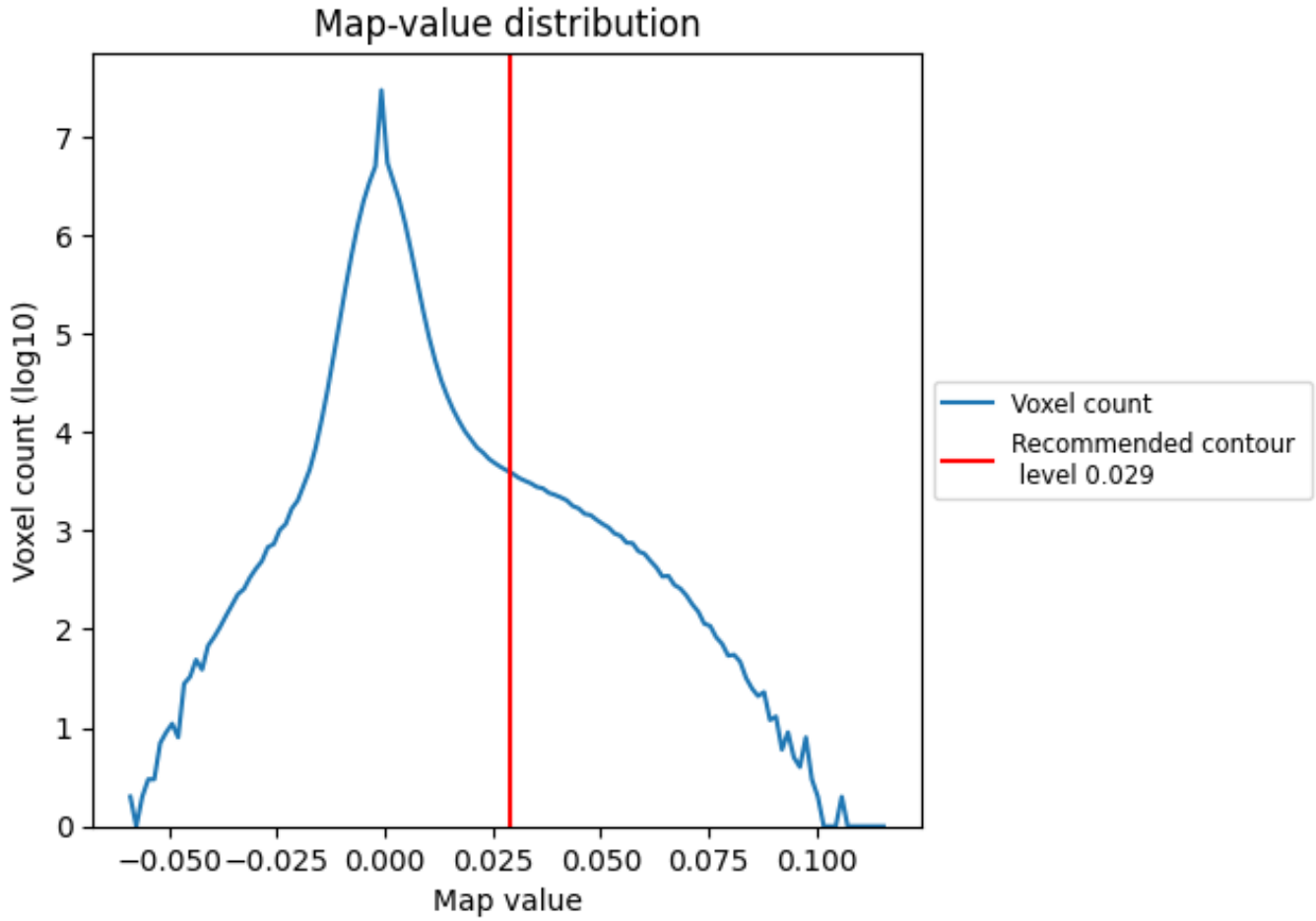
6.6 Mask visualisation (i)

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

7 Map analysis

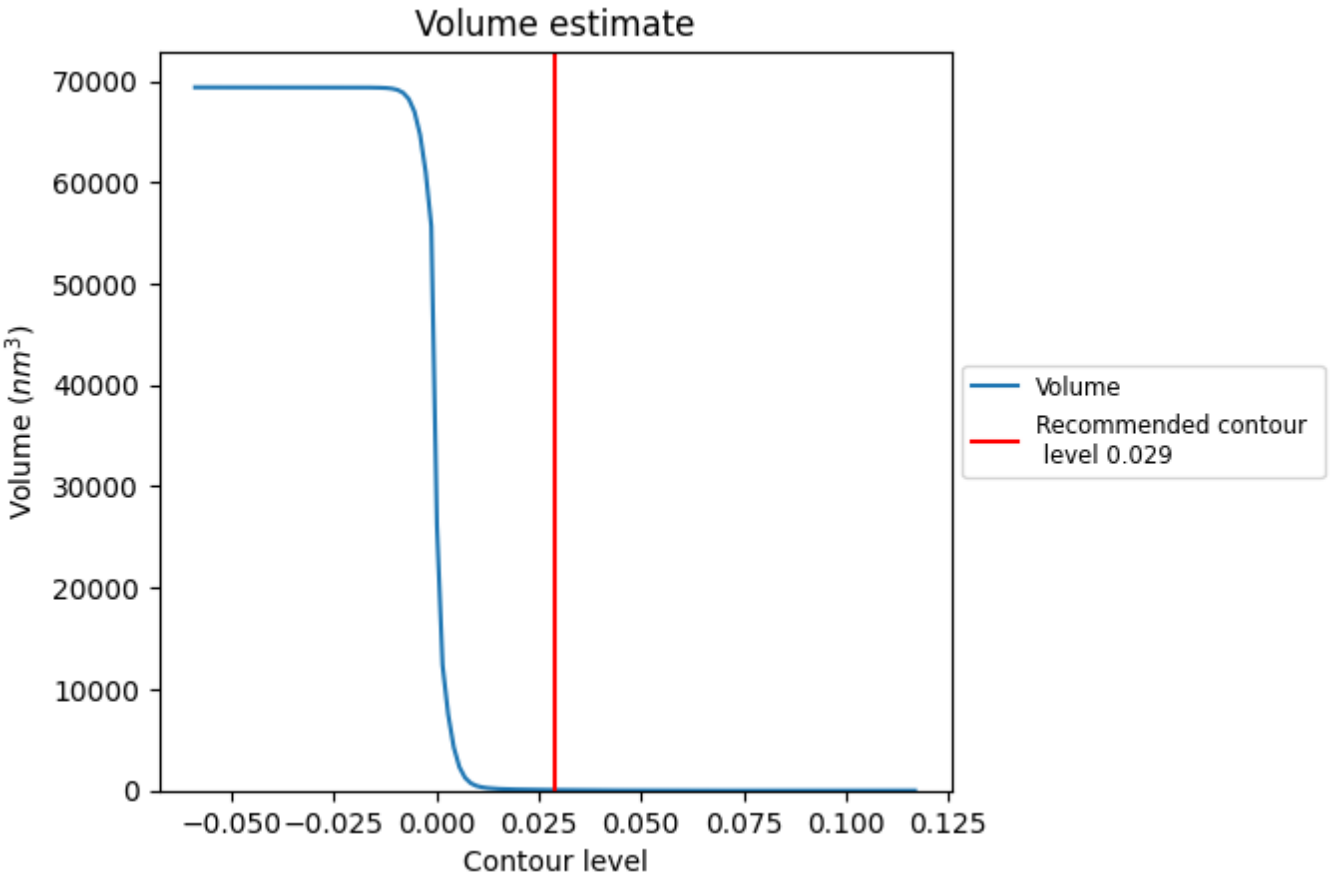
This section contains the results of statistical analysis of the map.

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.

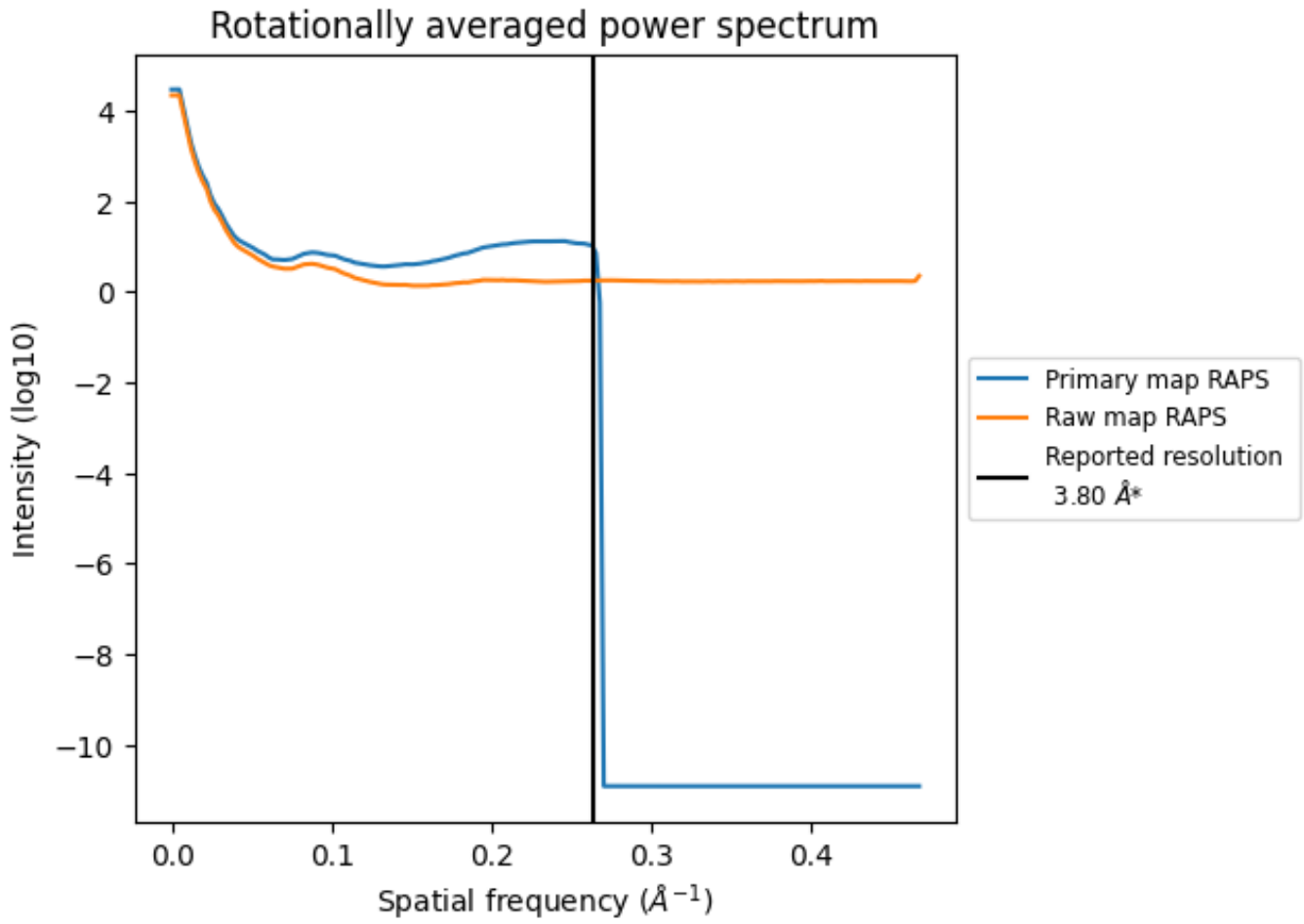
7.2 Volume estimate



The volume at the recommended contour level is 58 nm^3; this corresponds to an approximate mass of 53 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.

7.3 Rotationally averaged power spectrum (i)

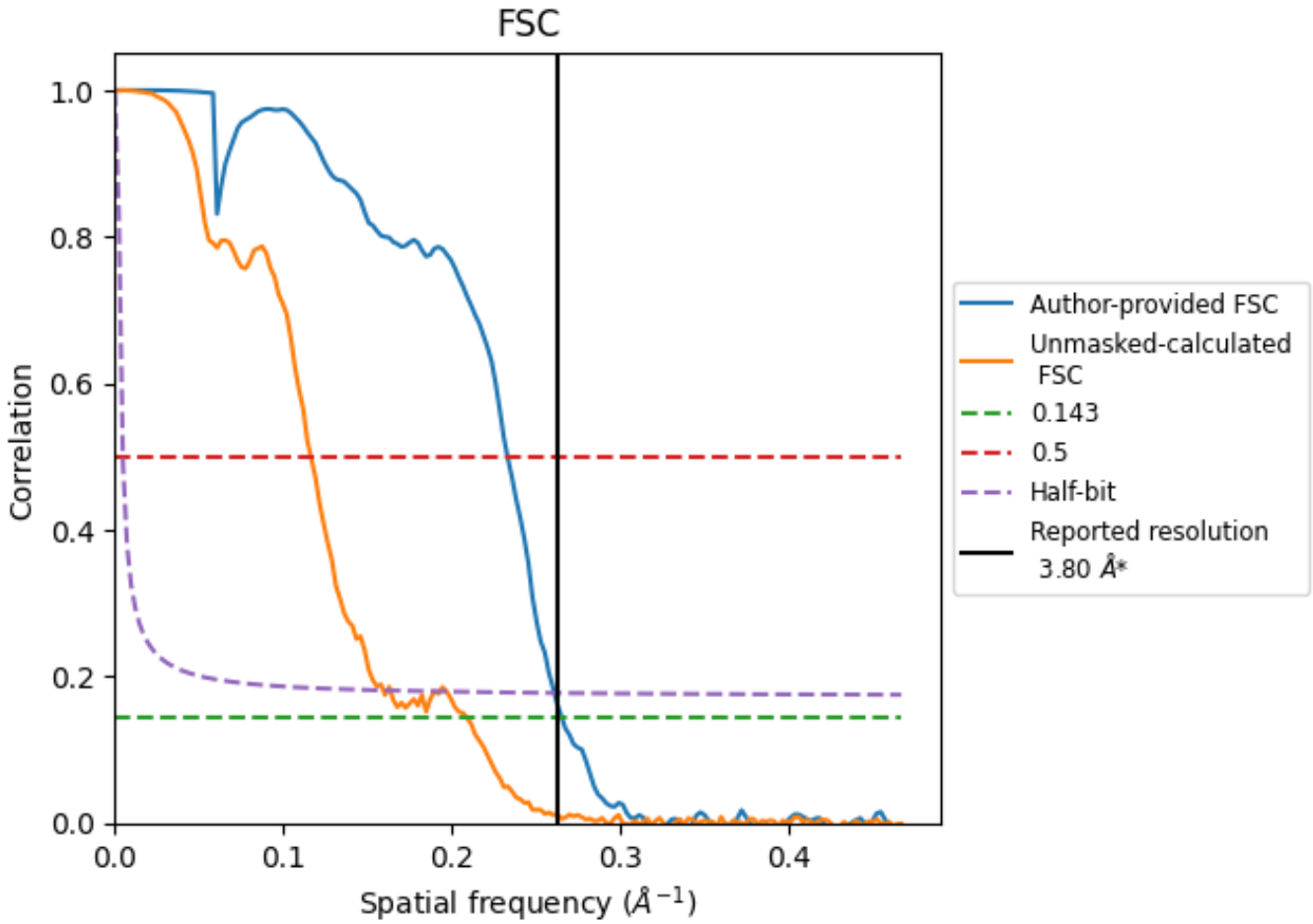


*Reported resolution corresponds to spatial frequency of 0.263 Å^{-1}

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 0.263 Å^{-1}

8.2 Resolution estimates (i)

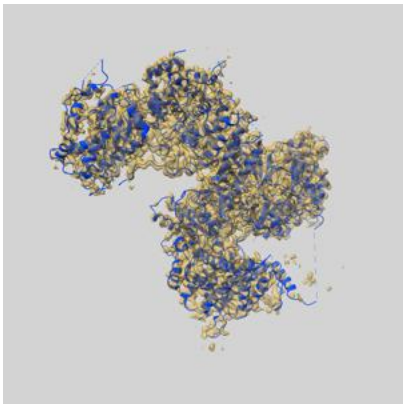
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.80	-	-
Author-provided FSC curve	3.77	4.28	3.83
Unmasked-calculated*	4.78	8.58	6.27

*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 4.78 differs from the reported value 3.8 by more than 10 %

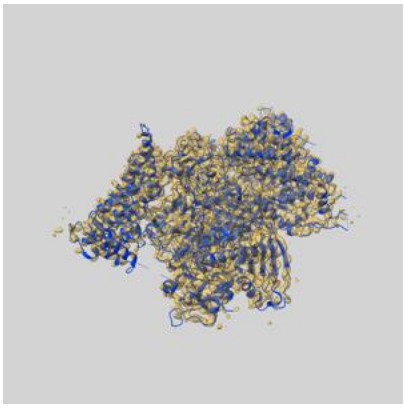
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-22989 and PDB model 7KPV. Per-residue inclusion information can be found in section 3 on page 4.

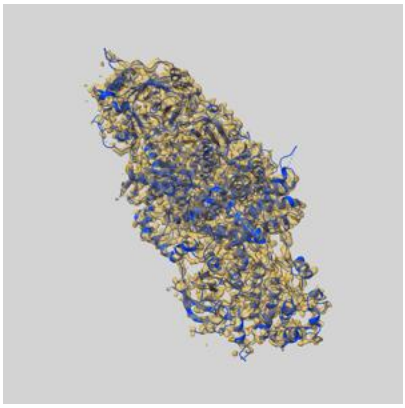
9.1 Map-model overlay



X



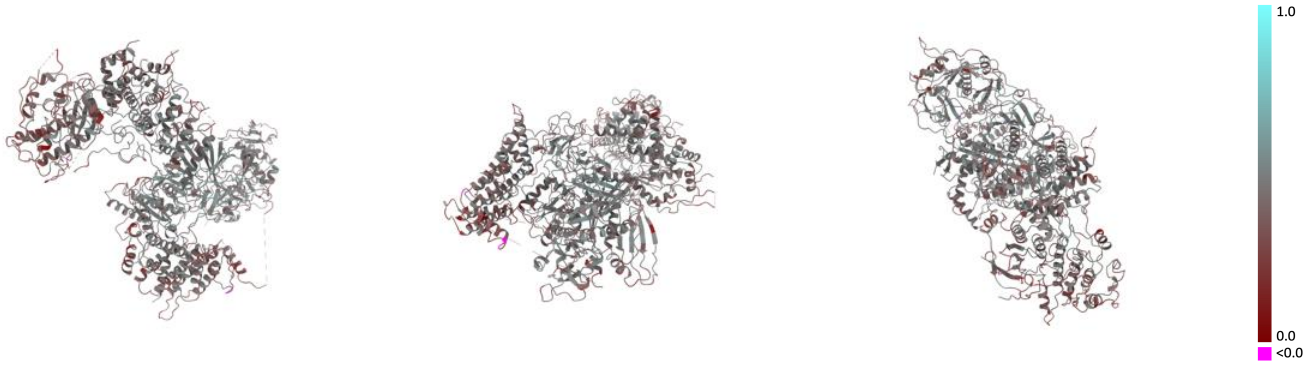
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.029 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.

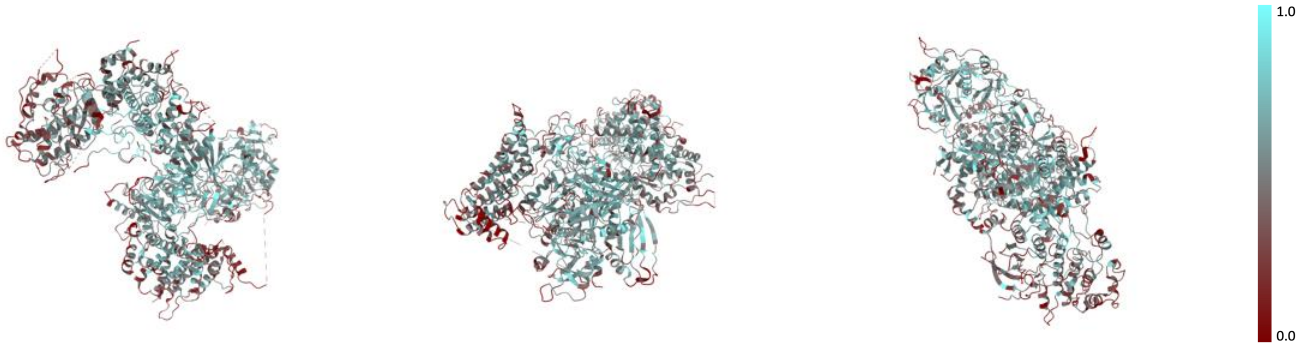
9.2 Q-score mapped to coordinate model (i)



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.

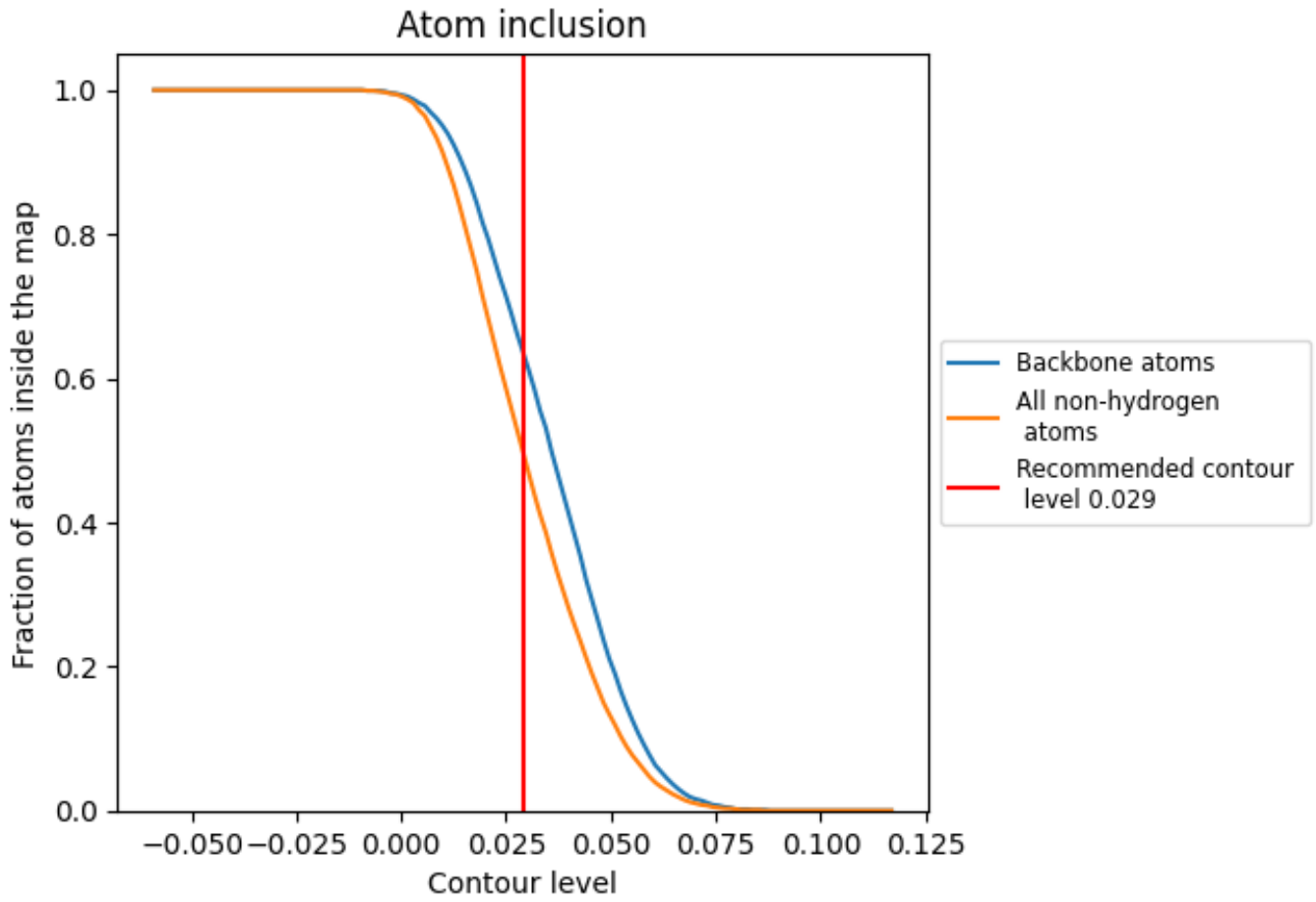
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.029).

9.4 Atom inclusion (i)



At the recommended contour level, 64% of all backbone atoms, 50% 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 (0.029) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.4970	0.4250
A	0.4000	0.3810
B	0.5450	0.4320
C	0.4440	0.4040
D	0.5500	0.4520