Full wwPDB EM Validation Report

Jun 7, 2025 – 01:34 pm BST

PDB ID	:	8S82 / pdb_00008s82
EMDB ID	:	EMD-19790
Title	:	Restriction on Ku Inward Translocation Caps Telomere Ends
Authors	:	Mattarocci, S.; Baconnais, S.; Roisne-Hamelin, F.; Pobiega, S.; Alibert, O.; Morin, V.; Deshayes, A.; Veaute, X.; Ropars, V.; Mazon, G.; Busso, D.; Fernandez Varela, P.; Le Cam, E.; Charbonnier, J.; Cuniasse, P.; Marcand, S.
Deposited on	:	2024-03-05
Resolution	:	2.92 Å(reported)
Based on initial models	:	3UKG, 5Y58

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:

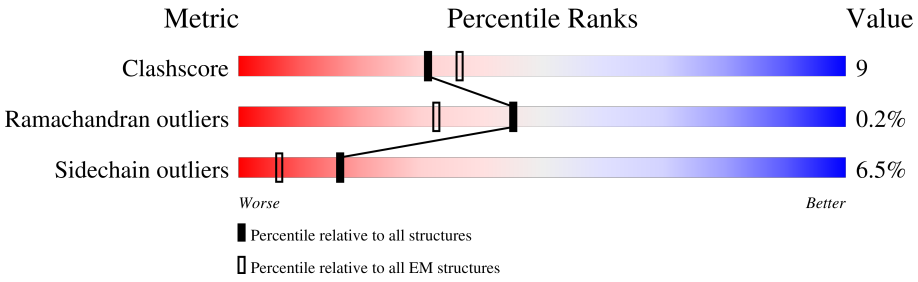
EMDB validation analysis	:	0.0.1.dev118
MolProbity	:	4-5-2 with Phenix2.0rc1
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.43.1

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 2.92 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	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

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	K	602	67% 24% 7%
2	L	629	10% 69% 22% 7%
3	D	21	5% 71% 29%
4	C	21	14% 52% 48%

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 10128 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 ATP-dependent DNA helicase II subunit 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	K	557	4616	2964	756	879	17	0	0

- Molecule 2 is a protein called ATP-dependent DNA helicase II subunit 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	L	587	4657	2934	773	927	23	0	0

- Molecule 3 is a DNA chain called DNA (5'-D(*GP*TP*GP*GP*TP*GP*TP*GP*TP*GP*GP*GP*TP*GP*TP*GP*TP*GP*TP*GP*T)-3').

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
3	D	21	441	210	78	133	20	0	0

- Molecule 4 is a DNA chain called DNA (5'-D(*AP*CP*AP*CP*AP*CP*AP*CP*AP*CP*CP*CP*AP*CP*AP*CP*AP*CP*CP*AP*C)-3').

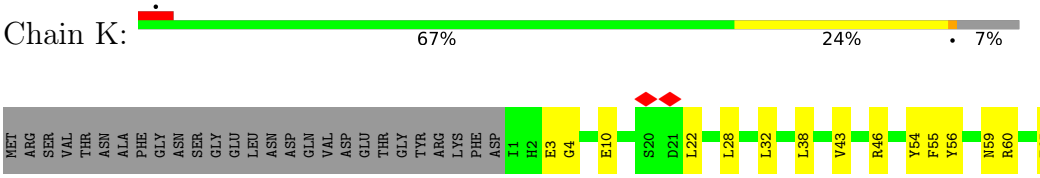
Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
4	C	21	414	198	81	115	20	0	0

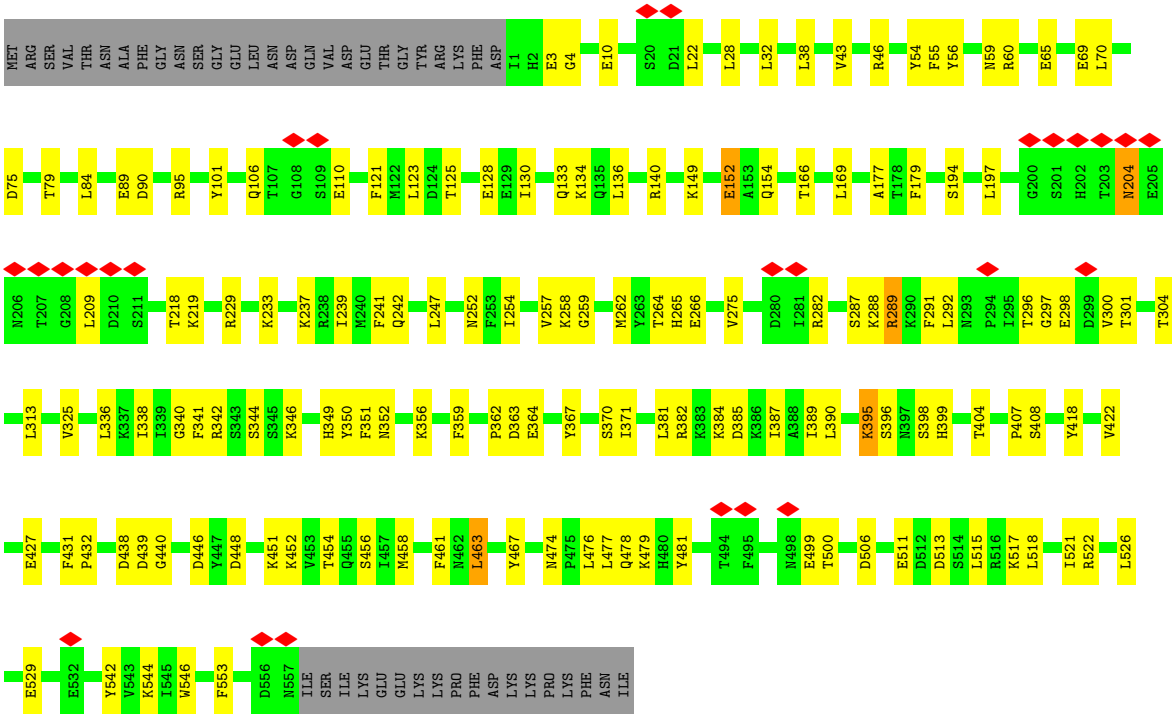
3 Residue-property plots (i)

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: ATP-dependent DNA helicase II subunit 1

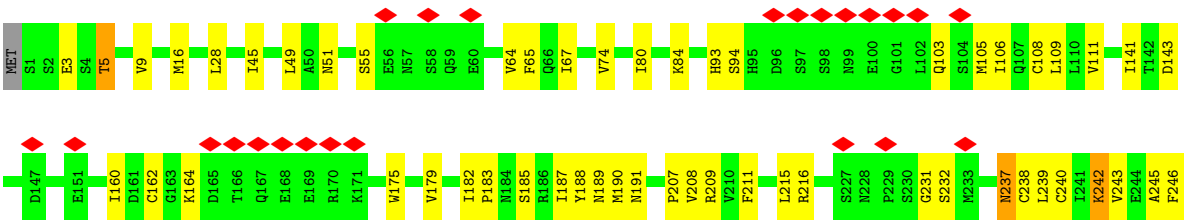
Chain K:

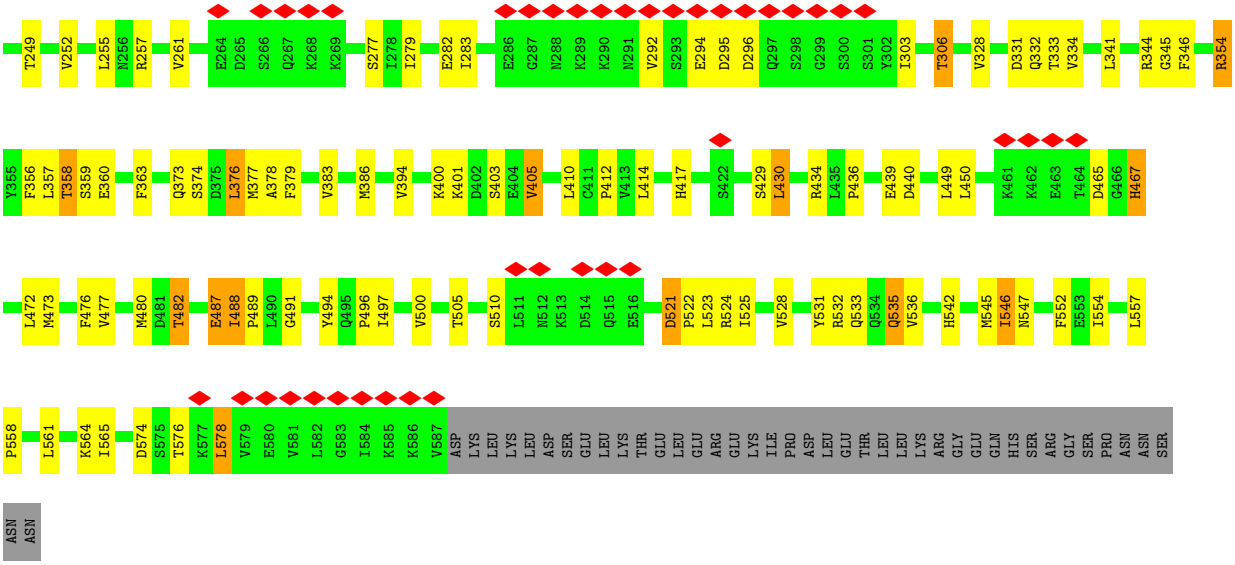




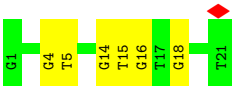
• Molecule 2: ATP-dependent DNA helicase II subunit 2

Chain L:

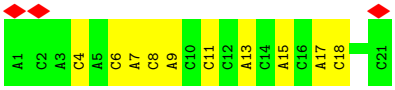




• Molecule 3: DNA (5’-D(*GP*TP*GP*GP*TP*GP*TP*GP*TP*GP*GP*GP*TP*GP*TP*GP*TP*GP*TP*GP*T)-3’)



• Molecule 4: DNA (5’-D(*AP*CP*AP*CP*AP*CP*AP*CP*AP*CP*CP*CP*AP*CP*AP*CP*AP*CP*CP*AP*C)-3’)



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	689183	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 ($e^-/Å^2$)	52	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	3000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	1.867	Depositor
Minimum map value	-1.377	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.021	Depositor
Recommended contour level	0.091	Depositor
Map size (Å)	336.384, 336.384, 336.384	wwPDB
Map dimensions	512, 512, 512	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.657, 0.657, 0.657	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	K	0.18	0/4716	0.41	0/6349
2	L	0.16	0/4734	0.41	0/6411
3	D	0.20	0/494	0.38	0/766
4	C	0.19	0/464	0.30	0/709
All	All	0.17	0/10408	0.41	0/14235

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	K	4616	0	4585	93	0
2	L	4657	0	4687	99	0
3	D	441	0	242	4	0
4	C	414	0	233	8	0
All	All	10128	0	9747	170	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 9.

All (170) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:K:439:ASP:HB3	2:L:376:LEU:HD22	1.73	0.70
2:L:189:ASN:OD1	2:L:191:ASN:ND2	2.25	0.70
1:K:289:ARG:HG2	2:L:279:ILE:HG22	1.74	0.69
2:L:51:ASN:HB3	2:L:103:GLN:HE21	1.58	0.68
1:K:75:ASP:OD1	1:K:133:GLN:NE2	2.27	0.66
1:K:60:ARG:NH1	1:K:101:TYR:O	2.29	0.66
1:K:342:ARG:NH1	2:L:482:THR:O	2.28	0.66
2:L:434:ARG:NH2	2:L:440:ASP:OD2	2.29	0.65
1:K:474:ASN:HB3	1:K:477:LEU:HB2	1.79	0.65
1:K:258:LYS:HG3	1:K:363:ASP:HB2	1.78	0.64
3:D:4:DG:H2"	3:D:5:DT:H5"	1.79	0.64
1:K:467:TYR:OH	2:L:436:PRO:O	2.07	0.64
1:K:395:LYS:HE3	1:K:396:SER:H	1.63	0.63
1:K:463:LEU:HD13	2:L:345:GLY:HA3	1.80	0.63
2:L:535:GLN:HE22	2:L:558:PRO:HD3	1.63	0.63
1:K:515:LEU:HD23	1:K:518:LEU:HD12	1.81	0.63
1:K:399:HIS:NE2	4:C:8:DC:OP2	2.29	0.63
1:K:479:LYS:NZ	2:L:332:GLN:O	2.28	0.62
2:L:232:SER:OG	2:L:238:CYS:SG	2.57	0.62
1:K:239:ILE:HD11	1:K:242:GLN:HB2	1.80	0.62
1:K:204:ASN:ND2	1:K:209:LEU:O	2.33	0.61
2:L:358:THR:O	2:L:358:THR:OG1	2.17	0.61
2:L:179:VAL:O	2:L:185:SER:OG	2.19	0.60
2:L:182:ILE:HD12	2:L:183:PRO:HD2	1.83	0.60
1:K:513:ASP:OD1	1:K:517:LYS:NZ	2.36	0.59
4:C:6:DC:H2'	4:C:7:DA:C8	2.39	0.58
1:K:364:GLU:HB2	1:K:371:ILE:HG13	1.86	0.57
1:K:448:ASP:OD1	1:K:452:LYS:NZ	2.37	0.57
1:K:287:SER:O	1:K:289:ARG:HB2	2.05	0.57
2:L:245:ALA:HA	2:L:363:PHE:O	2.04	0.57
1:K:362:PRO:HB2	1:K:371:ILE:HG12	1.86	0.56
1:K:166:THR:HG21	1:K:197:LEU:HA	1.86	0.56
1:K:340:GLY:HA2	2:L:480:MET:HG2	1.88	0.56
1:K:32:LEU:HD21	1:K:55:PHE:HZ	1.71	0.56
2:L:16:MET:HE1	2:L:94:SER:HA	1.87	0.56
3:D:15:DT:H2"	3:D:16:DG:C8	2.41	0.56
1:K:46:ARG:HH12	4:C:4:DC:H4'	1.71	0.56
2:L:3:GLU:OE2	2:L:505:THR:OG1	2.23	0.55
1:K:382:ARG:NH1	1:K:408:SER:O	2.35	0.55
1:K:90:ASP:OD1	1:K:95:ARG:NH2	2.39	0.55
2:L:211:PHE:HB3	2:L:245:ALA:HB3	1.89	0.55
2:L:482:THR:O	2:L:482:THR:OG1	2.25	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:L:295:ASP:OD1	2:L:296:ASP:N	2.40	0.54
1:K:350:TYR:HD1	2:L:357:LEU:HD11	1.73	0.53
1:K:292:LEU:HA	1:K:300:VAL:HG11	1.90	0.53
2:L:105:MET:O	2:L:108:CYS:HB3	2.09	0.53
1:K:247:LEU:HB3	2:L:476:PHE:CZ	2.43	0.52
1:K:439:ASP:OD1	1:K:440:GLY:N	2.40	0.52
1:K:264:THR:OG1	1:K:265:HIS:N	2.43	0.52
1:K:304:THR:HG22	2:L:261:VAL:HG22	1.91	0.52
1:K:367:TYR:O	1:K:370:SER:OG	2.20	0.51
1:K:458:MET:HG3	2:L:346:PHE:CD2	2.45	0.51
1:K:526:LEU:O	1:K:529:GLU:HG2	2.10	0.51
2:L:522:PRO:HG2	2:L:523:LEU:HD22	1.92	0.51
1:K:292:LEU:HD21	1:K:297:GLY:HA2	1.93	0.51
1:K:55:PHE:HE1	1:K:70:LEU:HB2	1.75	0.50
1:K:432:PRO:HA	2:L:207:PRO:HG3	1.93	0.50
2:L:574:ASP:OD1	2:L:576:THR:OG1	2.30	0.49
2:L:488:ILE:HD13	2:L:524:ARG:NH1	2.27	0.49
2:L:216:ARG:HA	2:L:239:LEU:O	2.12	0.49
1:K:387:ILE:HD13	1:K:404:THR:HG23	1.95	0.49
2:L:400:LYS:HB2	2:L:403:SER:HB2	1.94	0.49
2:L:528:VAL:HG22	2:L:561:LEU:HD11	1.94	0.49
2:L:358:THR:HG23	2:L:434:ARG:HG2	1.93	0.49
2:L:552:PHE:CE1	2:L:554:ILE:HG13	2.47	0.49
1:K:325:VAL:HG13	2:L:536:VAL:HG21	1.93	0.49
1:K:123:LEU:HD12	1:K:169:LEU:HD12	1.94	0.49
1:K:346:LYS:HE2	2:L:487:GLU:HB3	1.94	0.49
1:K:342:ARG:HD3	2:L:523:LEU:HD21	1.95	0.48
1:K:194:SER:HA	1:K:218:THR:HG21	1.95	0.48
1:K:275:VAL:HG11	1:K:282:ARG:HH11	1.79	0.48
2:L:379:PHE:HE2	2:L:429:SER:HA	1.77	0.48
1:K:266:GLU:HB3	1:K:477:LEU:HD11	1.96	0.47
2:L:255:LEU:HB3	2:L:533:GLN:NE2	2.28	0.47
2:L:488:ILE:HD13	2:L:524:ARG:HH11	1.79	0.47
2:L:249:THR:O	2:L:360:GLU:HB3	2.14	0.47
1:K:458:MET:HG3	2:L:346:PHE:CG	2.49	0.47
2:L:450:LEU:H	2:L:450:LEU:HD12	1.79	0.47
2:L:106:ILE:HG21	2:L:141:ILE:HD13	1.95	0.47
2:L:383:VAL:HG22	2:L:430:LEU:HD22	1.96	0.47
2:L:93:HIS:O	2:L:93:HIS:ND1	2.49	0.47
2:L:521:ASP:O	2:L:564:LYS:NZ	2.48	0.47
1:K:28:LEU:HD11	1:K:55:PHE:HE2	1.80	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:L:160:ILE:HG13	2:L:188:TYR:HB2	1.97	0.46
2:L:525:ILE:HG22	2:L:564:LYS:HD3	1.97	0.46
1:K:341:PHE:CE2	2:L:477:VAL:HA	2.51	0.46
1:K:431:PHE:CD1	1:K:432:PRO:HD2	2.50	0.46
4:C:17:DA:H2'	4:C:18:DC:C6	2.50	0.46
1:K:351:PHE:O	2:L:494:TYR:OH	2.30	0.46
1:K:10:GLU:HA	1:K:56:TYR:O	2.15	0.46
2:L:109:LEU:HD11	2:L:175:TRP:CH2	2.51	0.45
1:K:422:VAL:HG11	2:L:523:LEU:HB3	1.99	0.45
2:L:473:MET:O	2:L:477:VAL:HG13	2.16	0.45
2:L:215:LEU:HD12	2:L:341:LEU:HD13	1.98	0.45
2:L:143:ASP:N	2:L:143:ASP:OD1	2.50	0.45
2:L:414:LEU:O	2:L:491:GLY:HA2	2.16	0.45
1:K:125:THR:O	1:K:128:GLU:HG2	2.17	0.45
1:K:247:LEU:HG	1:K:338:ILE:HD12	1.99	0.45
1:K:177:ALA:HB1	1:K:233:LYS:HE2	2.00	0.44
1:K:342:ARG:HD2	1:K:389:ILE:HD11	1.99	0.44
1:K:106:GLN:OE1	1:K:106:GLN:N	2.47	0.44
2:L:55:SER:HB2	2:L:65:PHE:HB2	1.98	0.44
2:L:162:CYS:HA	2:L:190:MET:HB2	1.99	0.44
2:L:356:PHE:O	2:L:436:PRO:HD3	2.18	0.44
1:K:179:PHE:HE2	1:K:229:ARG:HB3	1.81	0.44
1:K:395:LYS:O	1:K:398:SER:OG	2.29	0.44
4:C:15:DA:C8	4:C:15:DA:H5'	2.53	0.44
1:K:395:LYS:HD3	3:D:18:DG:H2"	2.00	0.44
1:K:54:TYR:CD2	1:K:69:GLU:HB3	2.53	0.44
2:L:386:MET:HE2	2:L:412:PRO:HD3	1.99	0.44
3:D:14:DG:H2'	3:D:15:DT:H71	2.00	0.44
1:K:478:GLN:NE2	2:L:439:GLU:OE2	2.50	0.43
2:L:557:LEU:HD11	2:L:561:LEU:HD23	2.00	0.43
2:L:80:ILE:HD13	2:L:545:MET:HB3	2.00	0.43
1:K:262:MET:HA	1:K:262:MET:HE2	2.00	0.43
4:C:13:DA:H5"	4:C:13:DA:H8	1.83	0.43
1:K:336:LEU:HD22	1:K:390:LEU:HD23	1.99	0.43
2:L:410:LEU:HB3	2:L:430:LEU:HG	2.00	0.43
1:K:262:MET:HG2	1:K:359:PHE:HB2	2.00	0.43
1:K:350:TYR:CE1	2:L:354:ARG:HG2	2.54	0.43
2:L:331:ASP:O	2:L:334:VAL:HG12	2.18	0.43
1:K:362:PRO:HD3	2:L:449:LEU:HD21	1.99	0.43
1:K:427:GLU:HG3	2:L:252:VAL:HG12	1.99	0.43
2:L:574:ASP:CG	2:L:576:THR:HG1	2.25	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:K:477:LEU:HD22	1:K:481:TYR:HE1	1.84	0.43
2:L:242:LYS:HB3	2:L:242:LYS:HE3	1.78	0.43
1:K:149:LYS:NZ	1:K:154:GLN:OE1	2.52	0.43
1:K:59:ASN:ND2	1:K:110:GLU:OE1	2.52	0.42
1:K:476:LEU:HD11	2:L:405:VAL:H	1.84	0.42
1:K:344:SER:N	1:K:385:ASP:O	2.50	0.42
1:K:349:HIS:HB2	1:K:352:ASN:OD1	2.20	0.42
2:L:282:GLU:HG2	2:L:306:THR:HB	2.00	0.42
1:K:432:PRO:HG3	2:L:246:PHE:CD2	2.54	0.42
2:L:232:SER:HB3	2:L:240:CYS:HB3	2.00	0.42
2:L:277:SER:HB2	4:C:11:DC:H5'	2.01	0.42
1:K:461:PHE:CE1	1:K:521:ILE:HG23	2.54	0.42
1:K:438:ASP:OD2	2:L:373:GLN:NE2	2.52	0.42
2:L:528:VAL:HG21	2:L:565:ILE:HG21	2.01	0.42
2:L:532:ARG:NH1	2:L:535:GLN:OE1	2.52	0.42
1:K:259:GLY:HA2	1:K:359:PHE:O	2.19	0.42
2:L:5:THR:HG23	2:L:45:ILE:HD13	2.02	0.42
2:L:49:LEU:HD22	2:L:67:ILE:HD11	2.00	0.42
2:L:531:TYR:CD2	2:L:561:LEU:HD22	2.54	0.42
2:L:542:HIS:O	2:L:546:ILE:HG23	2.19	0.42
1:K:553:PHE:HB2	2:L:374:SER:HB3	2.00	0.42
1:K:241:PHE:CE2	1:K:259:GLY:HA3	2.55	0.42
2:L:344:ARG:HH21	2:L:394:VAL:HG11	1.85	0.42
2:L:377:MET:HG3	2:L:378:ALA:N	2.34	0.42
2:L:359:SER:OG	2:L:434:ARG:HB3	2.20	0.41
2:L:377:MET:HE3	2:L:377:MET:HB2	1.86	0.41
2:L:84:LYS:HD2	2:L:546:ILE:HA	2.02	0.41
2:L:465:ASP:HB2	2:L:467:HIS:CE1	2.55	0.41
1:K:456:SER:HB3	1:K:542:TYR:CE1	2.56	0.41
1:K:4:GLY:HA3	1:K:136:LEU:HD13	2.02	0.41
1:K:262:MET:HG3	1:K:418:TYR:HE1	1.84	0.41
1:K:546:TRP:CD2	2:L:239:LEU:HG	2.56	0.41
2:L:216:ARG:NH1	2:L:231:GLY:HA2	2.36	0.41
2:L:578:LEU:H	2:L:578:LEU:HG	1.66	0.41
2:L:488:ILE:HG13	2:L:489:PRO:HD2	2.02	0.41
1:K:22:LEU:HD12	1:K:22:LEU:HA	1.87	0.41
1:K:152:GLU:H	1:K:152:GLU:HG2	1.67	0.41
1:K:296:THR:HG22	1:K:298:GLU:H	1.85	0.41
2:L:417:HIS:CE1	2:L:496:PRO:HG3	2.56	0.41
1:K:3:GLU:OE2	1:K:140:ARG:NH2	2.52	0.41
1:K:54:TYR:HA	1:K:69:GLU:HA	2.03	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:K:288:LYS:HA	1:K:289:ARG:CB	2.51	0.40
2:L:106:ILE:HD13	2:L:141:ILE:HB	2.04	0.40
2:L:257:ARG:O	4:C:9:DA:H5'	2.21	0.40
1:K:381:LEU:C	1:K:407:PRO:HG3	2.46	0.40
1:K:522:ARG:NH1	2:L:237:ASN:O	2.55	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	K	555/602 (92%)	534 (96%)	21 (4%)	0	100	100
2	L	585/629 (93%)	559 (96%)	24 (4%)	2 (0%)	37	65
All	All	1140/1231 (93%)	1093 (96%)	45 (4%)	2 (0%)	45	72

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	L	209	ARG
2	L	510	SER

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	K	518/559 (93%)	486 (94%)	32 (6%)	15	41
2	L	546/586 (93%)	509 (93%)	37 (7%)	13	36
All	All	1064/1145 (93%)	995 (94%)	69 (6%)	17	39

All (69) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	K	38	LEU
1	K	43	VAL
1	K	65	GLU
1	K	79	THR
1	K	84	LEU
1	K	89	GLU
1	K	121	PHE
1	K	130	ILE
1	K	134	LYS
1	K	152	GLU
1	K	204	ASN
1	K	219	LYS
1	K	237	LYS
1	K	252	ASN
1	K	254	ILE
1	K	257	VAL
1	K	289	ARG
1	K	291	PHE
1	K	301	THR
1	K	313	LEU
1	K	356	LYS
1	K	384	LYS
1	K	395	LYS
1	K	446	ASP
1	K	451	LYS
1	K	454	THR
1	K	463	LEU
1	K	499	GLU
1	K	500	THR
1	K	506	ASP
1	K	511	GLU
1	K	544	LYS
2	L	5	THR
2	L	9	VAL
2	L	28	LEU

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Mol	Chain	Res	Type
2	L	64	VAL
2	L	74	VAL
2	L	111	VAL
2	L	164	LYS
2	L	187	ILE
2	L	208	VAL
2	L	237	ASN
2	L	242	LYS
2	L	243	VAL
2	L	283	ILE
2	L	292	VAL
2	L	294	GLU
2	L	303	ILE
2	L	306	THR
2	L	328	VAL
2	L	333	THR
2	L	354	ARG
2	L	358	THR
2	L	376	LEU
2	L	401	LYS
2	L	405	VAL
2	L	430	LEU
2	L	467	HIS
2	L	472	LEU
2	L	482	THR
2	L	487	GLU
2	L	488	ILE
2	L	497	ILE
2	L	500	VAL
2	L	521	ASP
2	L	535	GLN
2	L	546	ILE
2	L	547	ASN
2	L	578	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (10) such sidechains are listed below:

Mol	Chain	Res	Type
1	K	133	GLN
1	K	204	ASN
1	K	283	GLN
1	K	323	GLN

Continued on next page...

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Mol	Chain	Res	Type
1	K	397	ASN
2	L	103	GLN
2	L	191	ASN
2	L	535	GLN
2	L	542	HIS
2	L	547	ASN

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 oligosaccharides 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.

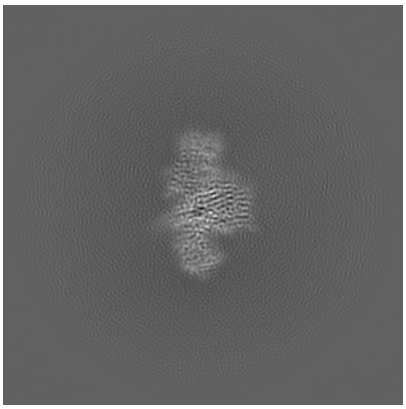
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-19790. These allow visual inspection of the internal detail of the map and identification of artifacts.

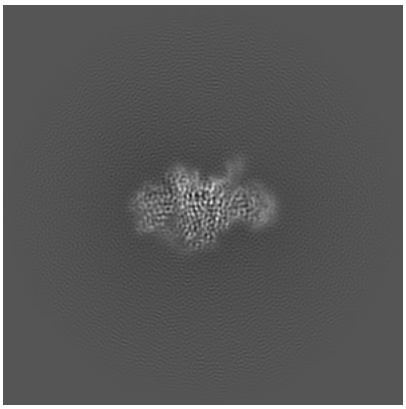
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

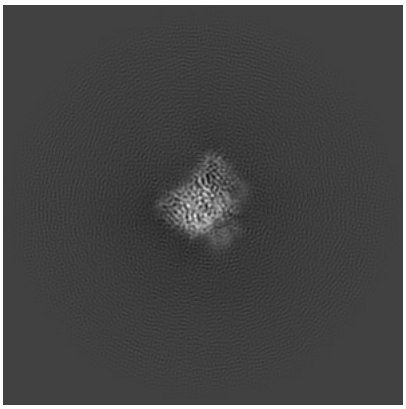
6.1.1 Primary map



X

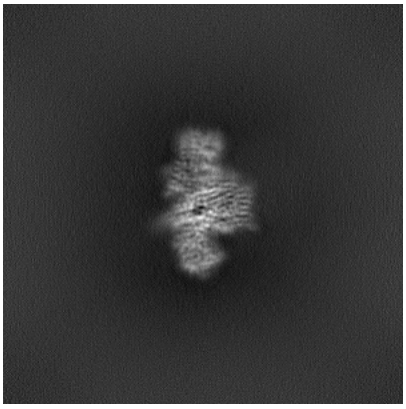


Y

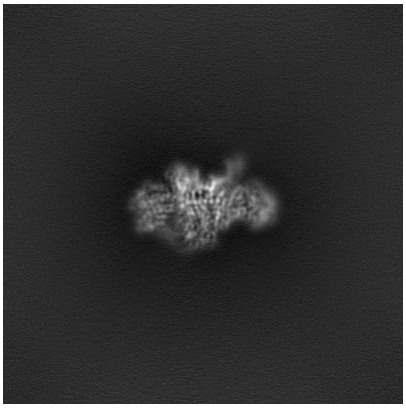


Z

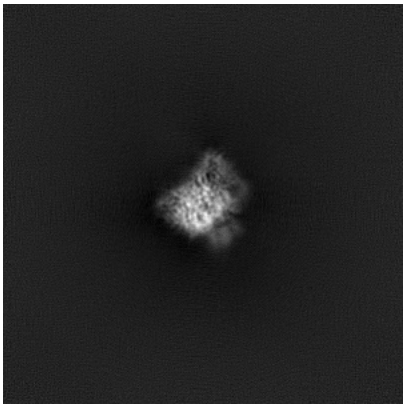
6.1.2 Raw map



X



Y

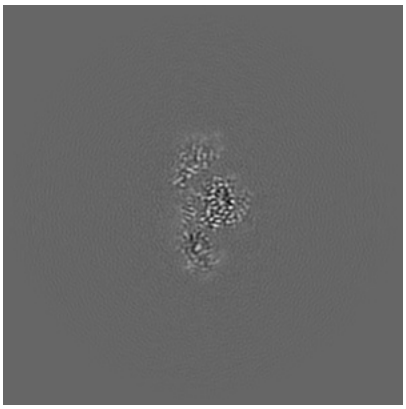


Z

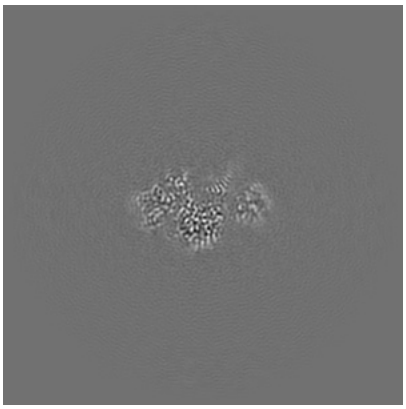
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

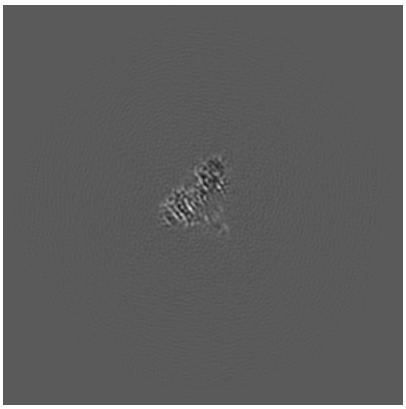
6.2.1 Primary map



X Index: 256

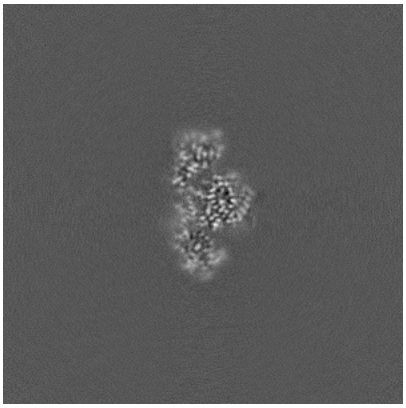


Y Index: 256

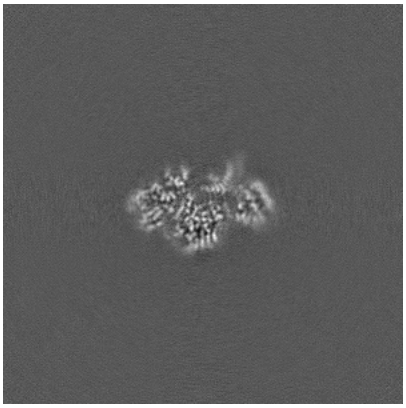


Z Index: 256

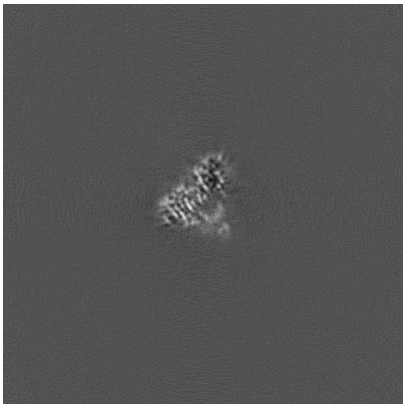
6.2.2 Raw map



X Index: 256



Y Index: 256

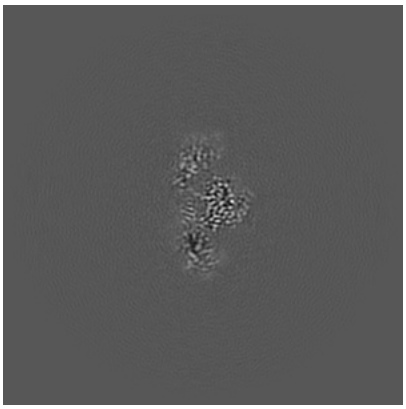


Z Index: 256

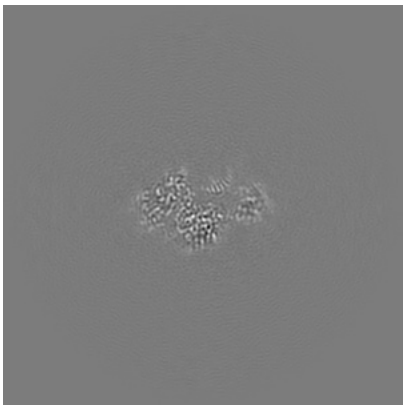
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

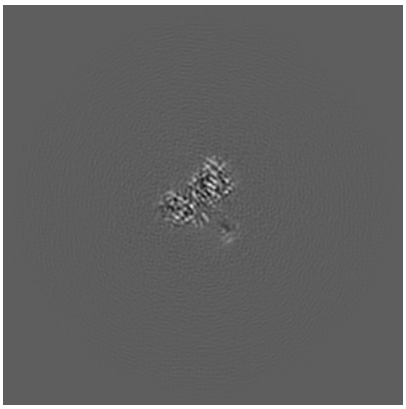
6.3.1 Primary map



X Index: 257

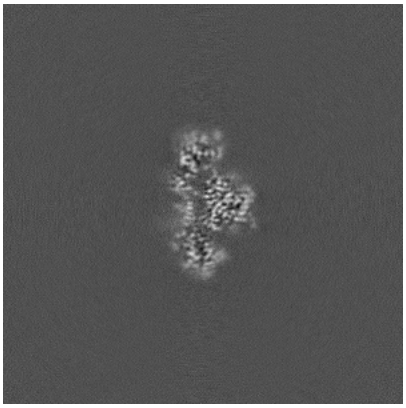


Y Index: 254

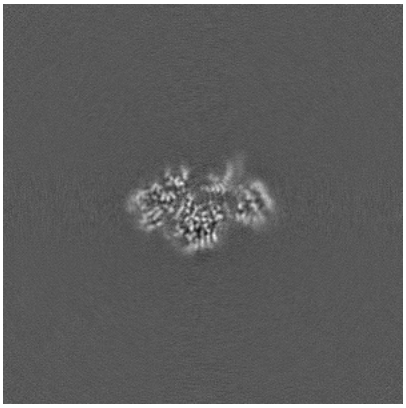


Z Index: 243

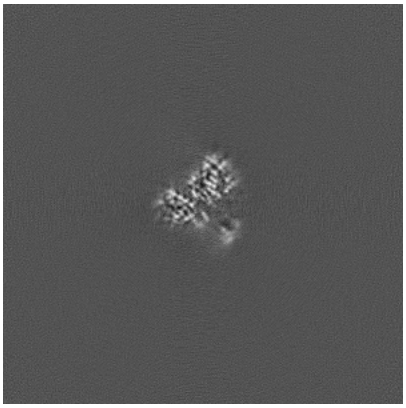
6.3.2 Raw map



X Index: 259



Y Index: 256

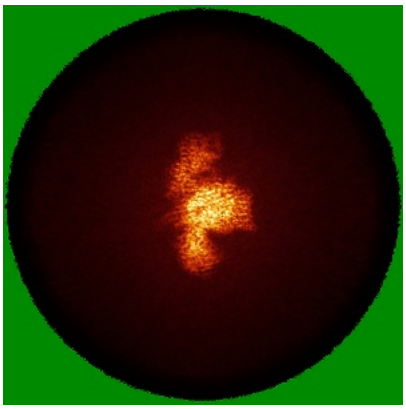


Z Index: 243

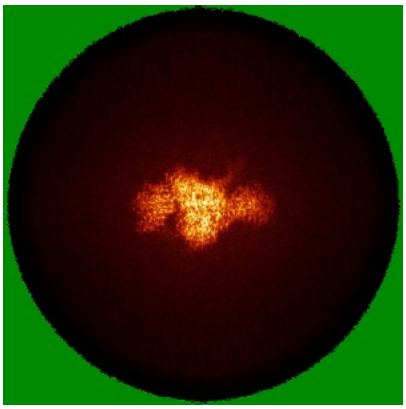
The images above show the largest variance slices of the map in three orthogonal directions.

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

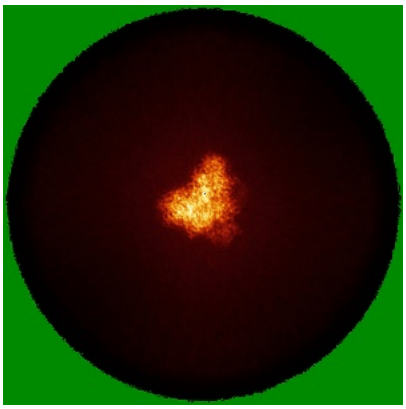
6.4.1 Primary map



X

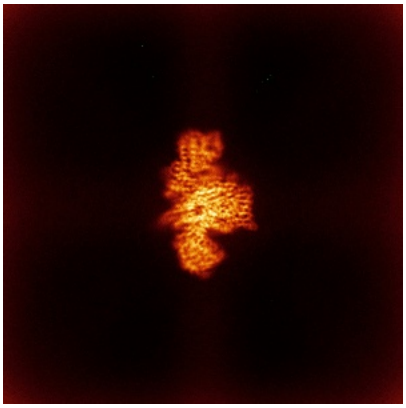


Y

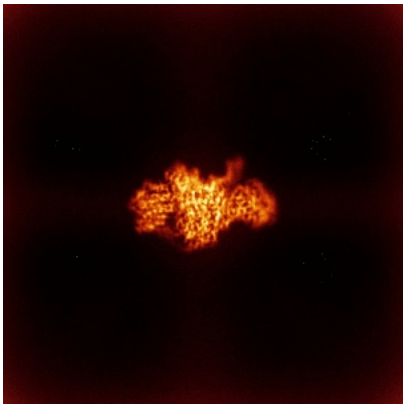


Z

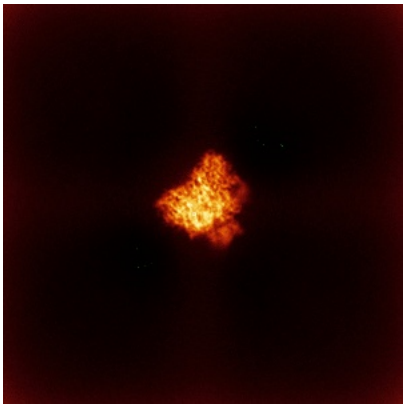
6.4.2 Raw map



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 0.091. 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.

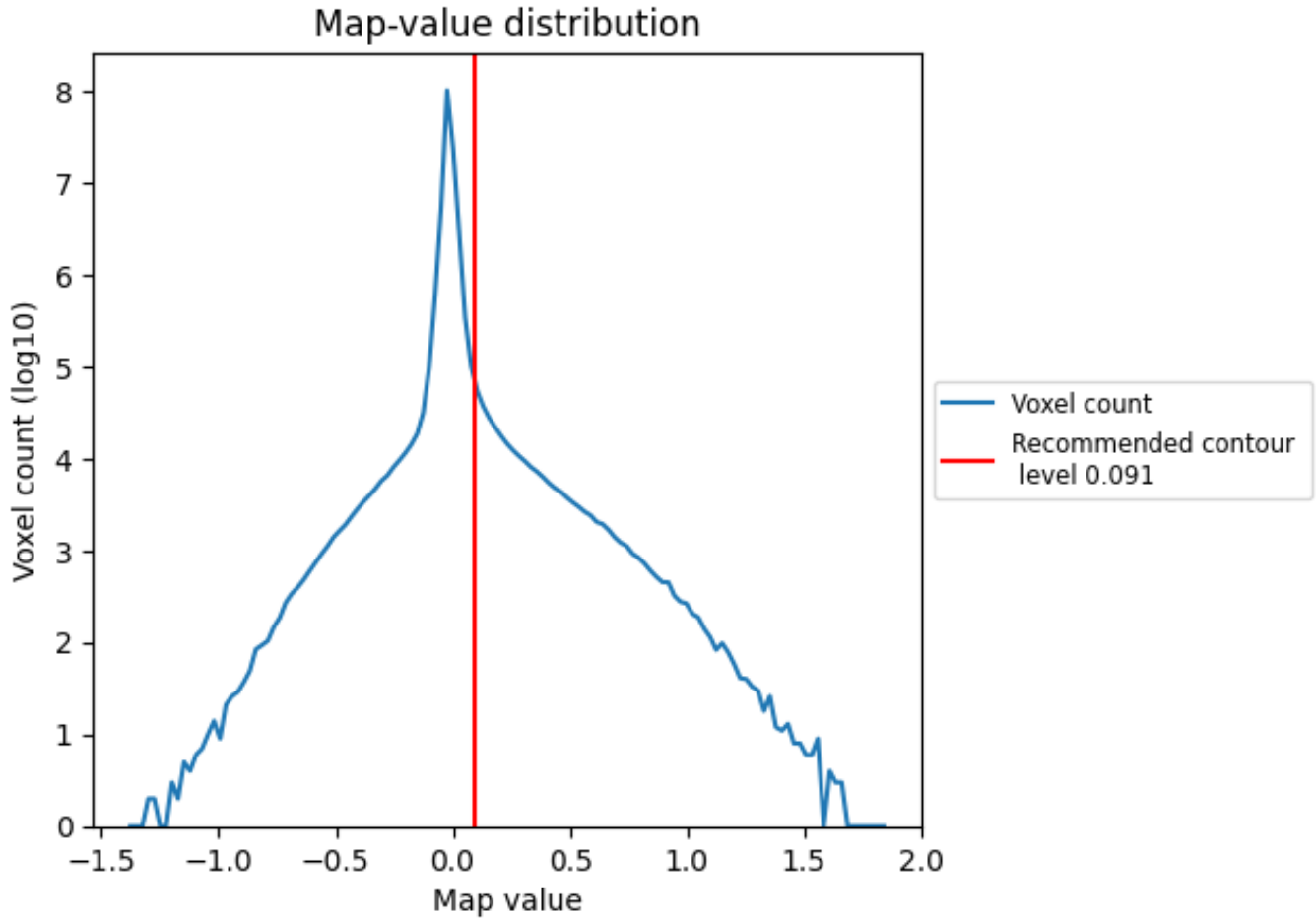
6.6 Mask visualisation (i)

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

7 Map analysis

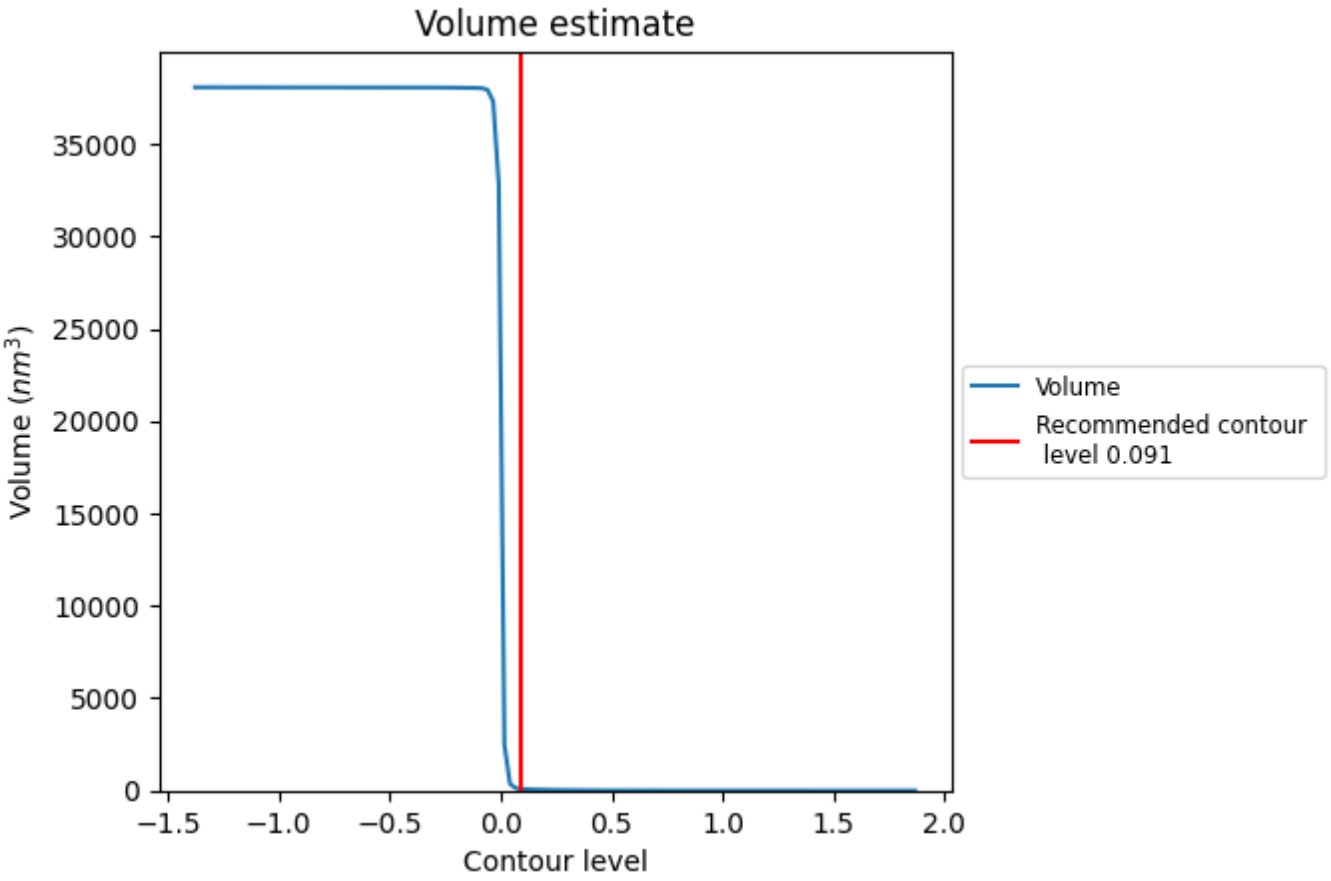
This section contains the results of statistical analysis of the map.

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.

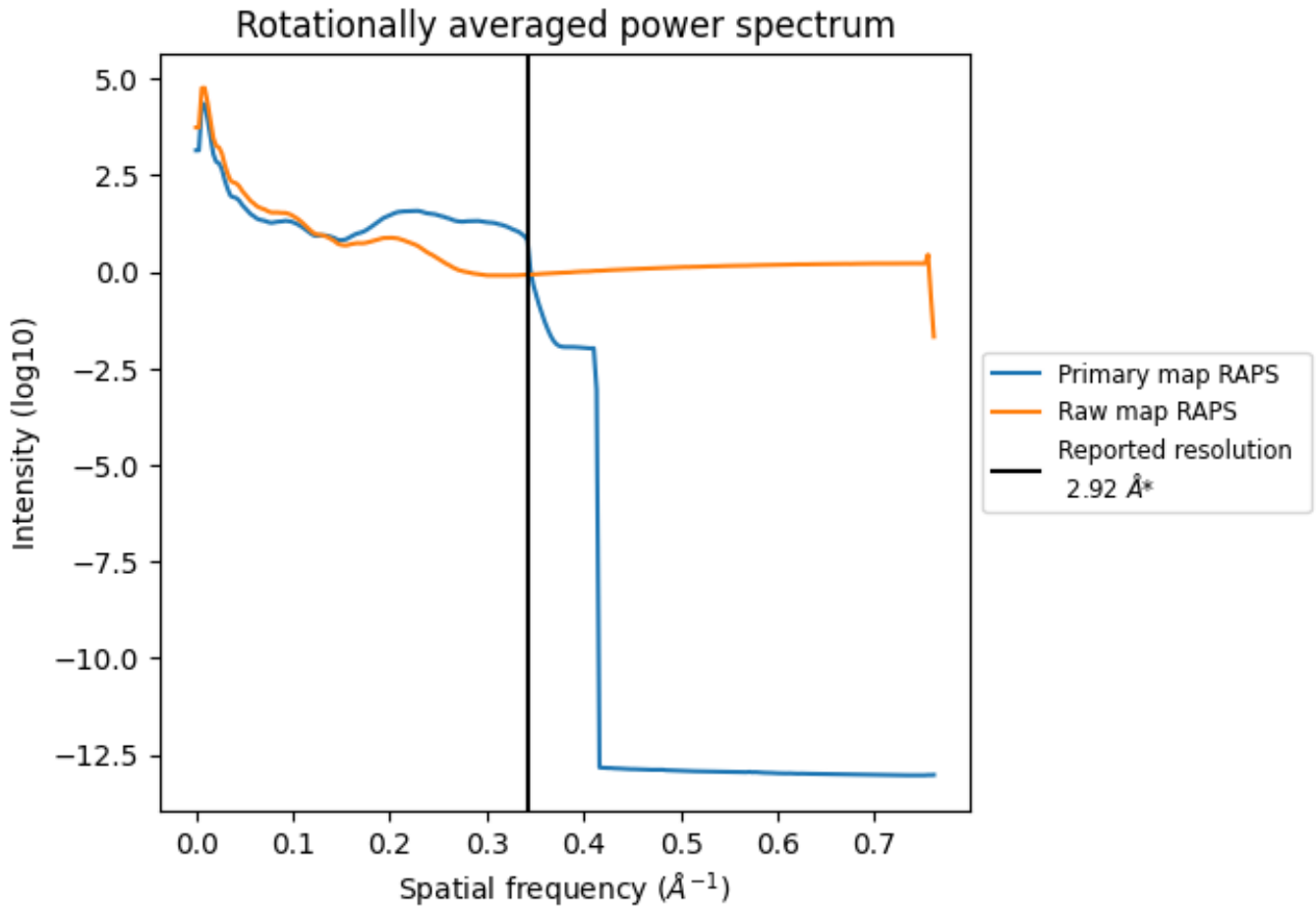
7.2 Volume estimate



The volume at the recommended contour level is 91 nm^3; this corresponds to an approximate mass of 82 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)

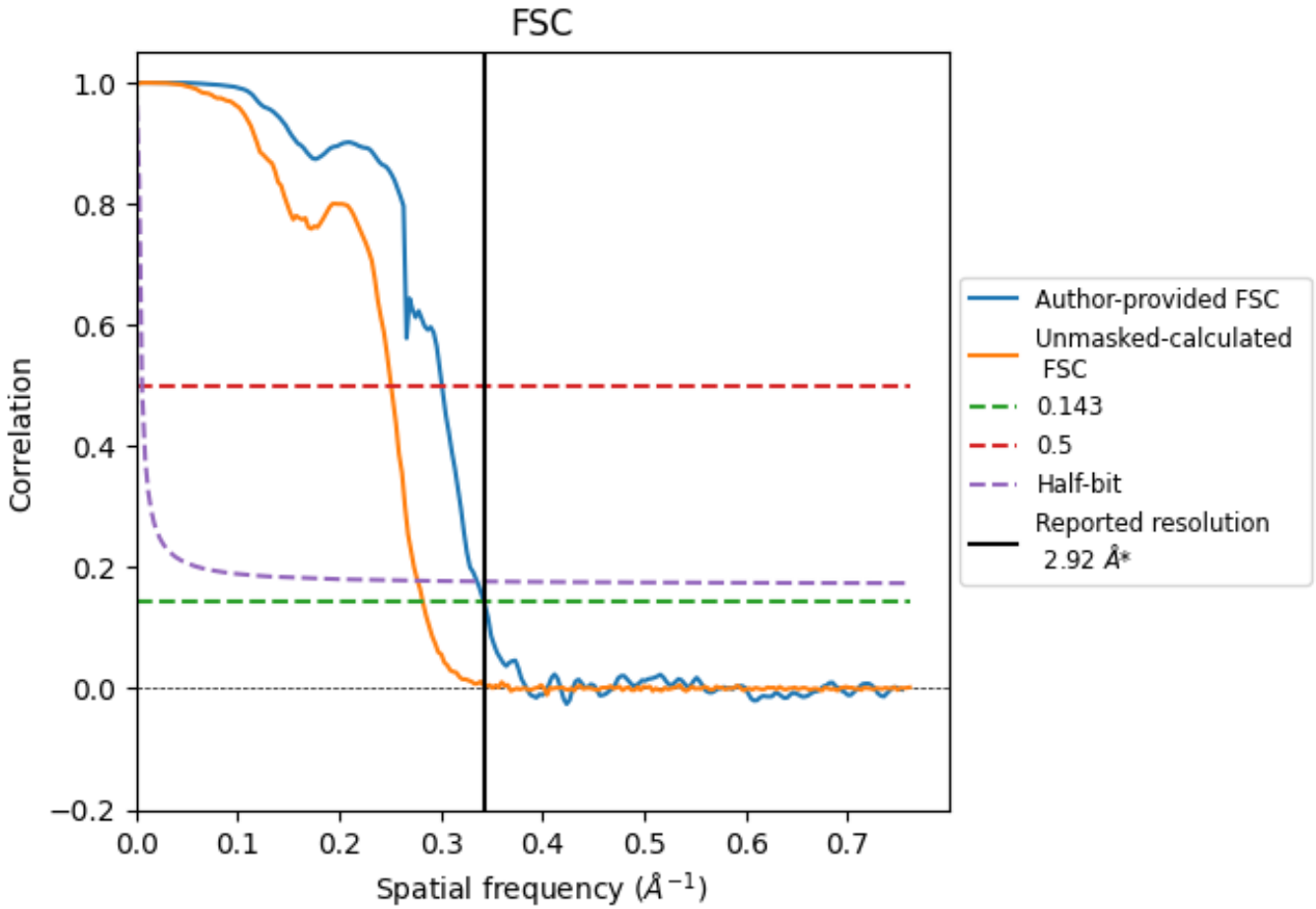


*Reported resolution corresponds to spatial frequency of 0.342 $Å^{-1}$

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 0.342 Å^{-1}

8.2 Resolution estimates (i)

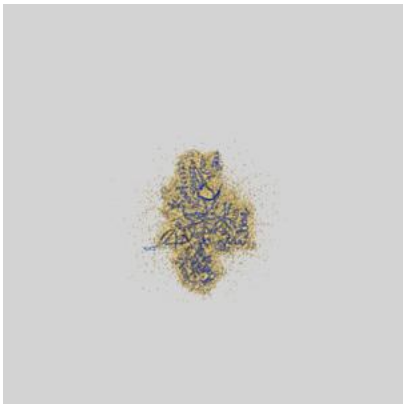
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.92	-	-
Author-provided FSC curve	2.92	3.32	2.98
Unmasked-calculated*	3.54	3.99	3.61

*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 2.92 by more than 10 %

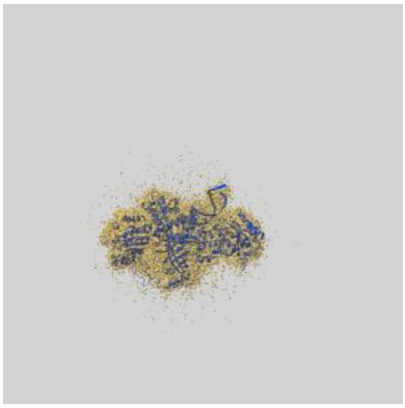
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-19790 and PDB model 8S82. Per-residue inclusion information can be found in section 3 on page 4.

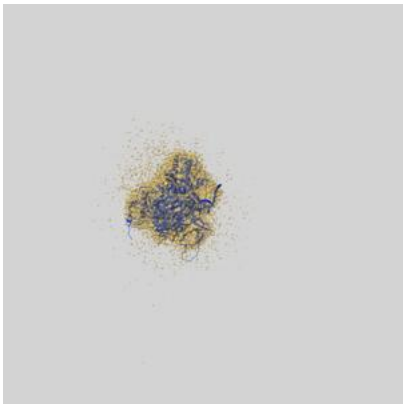
9.1 Map-model overlay



X



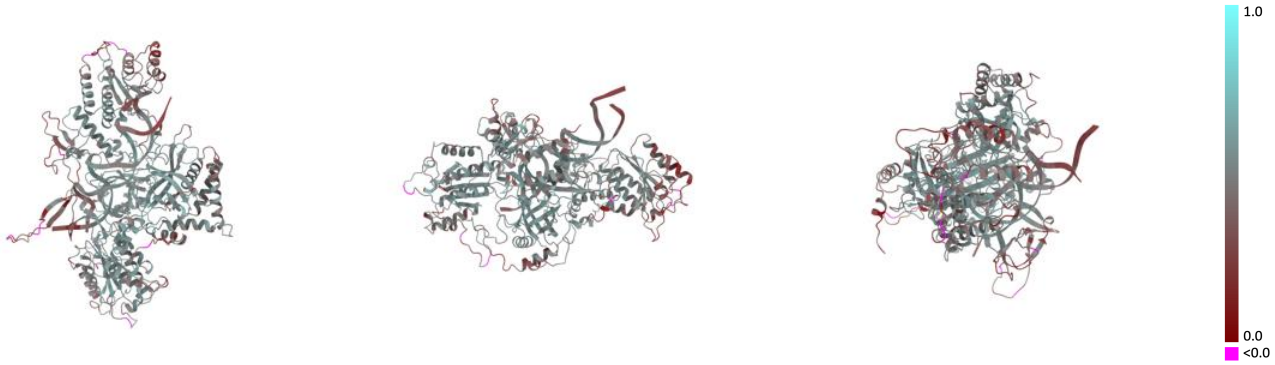
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.091 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.

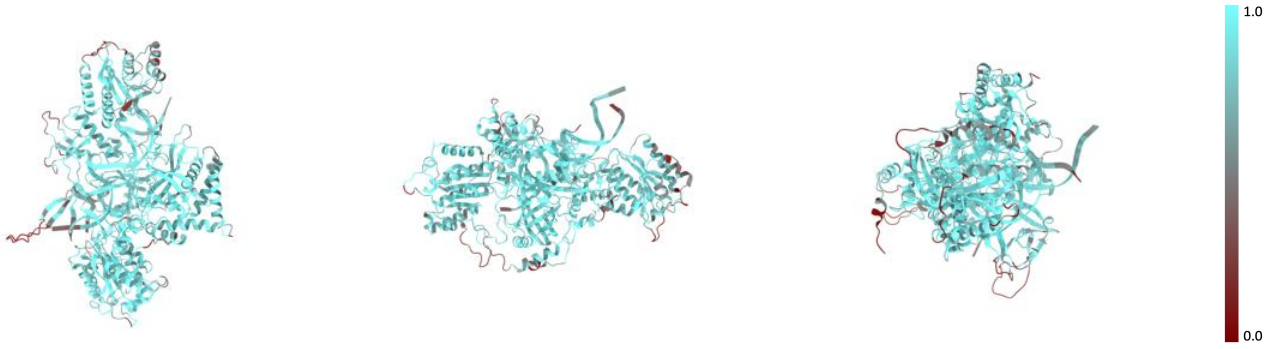
9.2 Q-score mapped to coordinate model (i)



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.

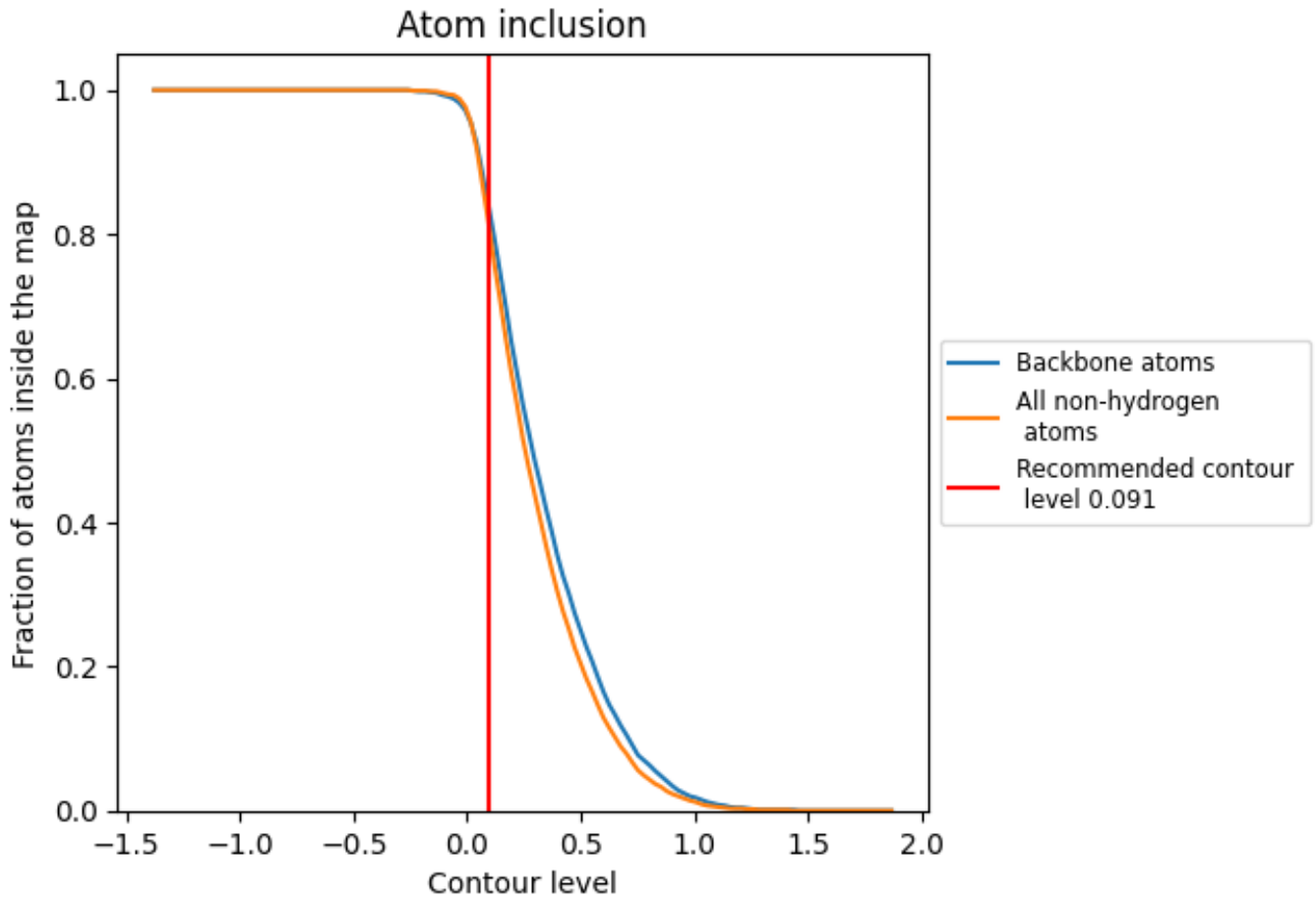
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.091).

9.4 Atom inclusion (i)



At the recommended contour level, 84% of all backbone atoms, 82% 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 (0.091) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8220	0.4710
C	0.8140	0.4690
D	0.8070	0.4400
K	0.8550	0.4890
L	0.7930	0.4560