Full wwPDB EM Validation Report ⓘ

Oct 13, 2024 – 08:10 am BST

PDB ID	:	6GSA
EMDB ID	:	EMD-0051
Title	:	Core Centromere Binding Factor 3 (CBF3) with monomeric Ndc10
Authors	:	Zhang, W.J.; Lukoynova, N.; Vaughan, C.K.
Deposited on	:	2018-06-13
Resolution	:	4.20 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:

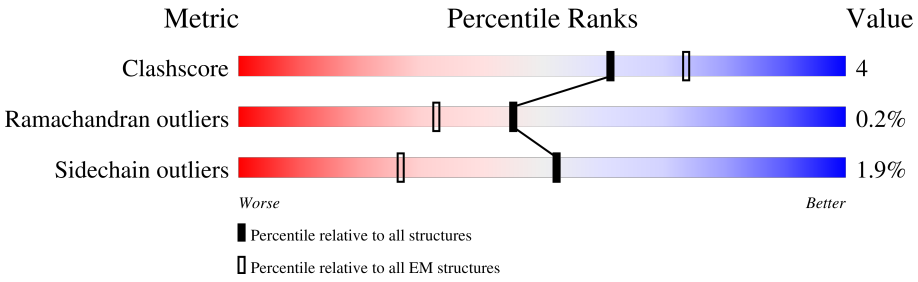
EMDB validation analysis	:	0.0.1.dev113
MolProbity	:	4.02b-467
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.39

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 4.20 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	A	584	80% 10% 10%
1	B	584	7% 79% 9% 12%
2	C	197	70% 7% 24%
3	D	519	59% 10% 30%
4	E	562	39% 67% 12% 20%

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 16272 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 Centromere DNA-binding protein complex CBF3 subunit B.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	524	Total 4320	C 2812	N 697	O 790	S 21	0	0
1	B	512	Total 4249	C 2766	N 685	O 777	S 21	0	0

There are 44 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	25	MET	-	initiating methionine	UNP P40969
A	26	GLY	-	expression tag	UNP P40969
A	27	GLY	-	expression tag	UNP P40969
A	28	SER	-	expression tag	UNP P40969
A	29	SER	-	expression tag	UNP P40969
A	30	HIS	-	expression tag	UNP P40969
A	31	HIS	-	expression tag	UNP P40969
A	32	HIS	-	expression tag	UNP P40969
A	33	HIS	-	expression tag	UNP P40969
A	34	HIS	-	expression tag	UNP P40969
A	35	HIS	-	expression tag	UNP P40969
A	36	SER	-	expression tag	UNP P40969
A	37	SER	-	expression tag	UNP P40969
A	38	GLY	-	expression tag	UNP P40969
A	39	LEU	-	expression tag	UNP P40969
A	40	VAL	-	expression tag	UNP P40969
A	41	PRO	-	expression tag	UNP P40969
A	42	ARG	-	expression tag	UNP P40969
A	43	GLY	-	expression tag	UNP P40969
A	44	SER	-	expression tag	UNP P40969
A	45	HIS	-	expression tag	UNP P40969
A	46	MET	-	expression tag	UNP P40969
B	25	MET	-	initiating methionine	UNP P40969
B	26	GLY	-	expression tag	UNP P40969
B	27	GLY	-	expression tag	UNP P40969
B	28	SER	-	expression tag	UNP P40969

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Chain	Residue	Modelled	Actual	Comment	Reference
B	29	SER	-	expression tag	UNP P40969
B	30	HIS	-	expression tag	UNP P40969
B	31	HIS	-	expression tag	UNP P40969
B	32	HIS	-	expression tag	UNP P40969
B	33	HIS	-	expression tag	UNP P40969
B	34	HIS	-	expression tag	UNP P40969
B	35	HIS	-	expression tag	UNP P40969
B	36	SER	-	expression tag	UNP P40969
B	37	SER	-	expression tag	UNP P40969
B	38	GLY	-	expression tag	UNP P40969
B	39	LEU	-	expression tag	UNP P40969
B	40	VAL	-	expression tag	UNP P40969
B	41	PRO	-	expression tag	UNP P40969
B	42	ARG	-	expression tag	UNP P40969
B	43	GLY	-	expression tag	UNP P40969
B	44	SER	-	expression tag	UNP P40969
B	45	HIS	-	expression tag	UNP P40969
B	46	MET	-	expression tag	UNP P40969

- Molecule 2 is a protein called Suppressor of kinetochore protein 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	C	150	Total	C	N	O	S	0	0
			1137	717	199	217	4		

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	0	MET	-	initiating methionine	UNP P52286
C	1	GLY	-	expression tag	UNP P52286
C	195	GLY	-	expression tag	UNP P52286
C	196	SER	-	expression tag	UNP P52286

- Molecule 3 is a protein called Centromere DNA-binding protein complex CBF3 subunit C.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	D	361	Total	C	N	O	S	0	0
			2773	1825	474	465	9		

There are 42 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
D	0	MET	-	initiating methionine	UNP P35203
D	1	GLY	-	expression tag	UNP P35203
D	479	GLY	-	expression tag	UNP P35203
D	480	SER	-	expression tag	UNP P35203
D	481	ARG	-	expression tag	UNP P35203
D	482	SER	-	expression tag	UNP P35203
D	483	GLY	-	expression tag	UNP P35203
D	484	SER	-	expression tag	UNP P35203
D	485	GLU	-	expression tag	UNP P35203
D	486	ASN	-	expression tag	UNP P35203
D	487	LEU	-	expression tag	UNP P35203
D	488	TYR	-	expression tag	UNP P35203
D	489	PHE	-	expression tag	UNP P35203
D	490	GLN	-	expression tag	UNP P35203
D	491	GLY	-	expression tag	UNP P35203
D	492	SER	-	expression tag	UNP P35203
D	493	LYS	-	expression tag	UNP P35203
D	494	ARG	-	expression tag	UNP P35203
D	495	ARG	-	expression tag	UNP P35203
D	496	TRP	-	expression tag	UNP P35203
D	497	LYS	-	expression tag	UNP P35203
D	498	LYS	-	expression tag	UNP P35203
D	499	ASN	-	expression tag	UNP P35203
D	500	PHE	-	expression tag	UNP P35203
D	501	ILE	-	expression tag	UNP P35203
D	502	ALA	-	expression tag	UNP P35203
D	503	VAL	-	expression tag	UNP P35203
D	504	SER	-	expression tag	UNP P35203
D	505	ALA	-	expression tag	UNP P35203
D	506	ALA	-	expression tag	UNP P35203
D	507	ASN	-	expression tag	UNP P35203
D	508	ARG	-	expression tag	UNP P35203
D	509	PHE	-	expression tag	UNP P35203
D	510	LYS	-	expression tag	UNP P35203
D	511	LYS	-	expression tag	UNP P35203
D	512	ILE	-	expression tag	UNP P35203
D	513	SER	-	expression tag	UNP P35203
D	514	SER	-	expression tag	UNP P35203
D	515	SER	-	expression tag	UNP P35203
D	516	GLY	-	expression tag	UNP P35203
D	517	ALA	-	expression tag	UNP P35203
D	518	LEU	-	expression tag	UNP P35203

- Molecule 4 is a protein called Centromere DNA-binding protein complex CBF3 subunit A.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	E	452	Total	C	N	O	S	0	0
			3793	2473	619	691	10		

There are 10 discrepancies between the modelled and reference sequences:

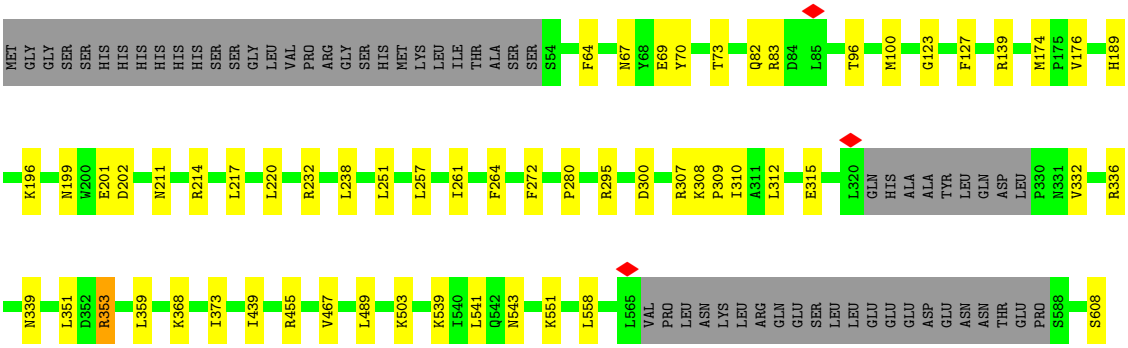
Chain	Residue	Modelled	Actual	Comment	Reference
E	0	MET	-	initiating methionine	UNP P32504
E	1	GLY	-	expression tag	UNP P32504
E	554	TRP	-	expression tag	UNP P32504
E	555	SER	-	expression tag	UNP P32504
E	556	HIS	-	expression tag	UNP P32504
E	557	PRO	-	expression tag	UNP P32504
E	558	GLN	-	expression tag	UNP P32504
E	559	PHE	-	expression tag	UNP P32504
E	560	GLU	-	expression tag	UNP P32504
E	561	LYS	-	expression tag	UNP P32504

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.

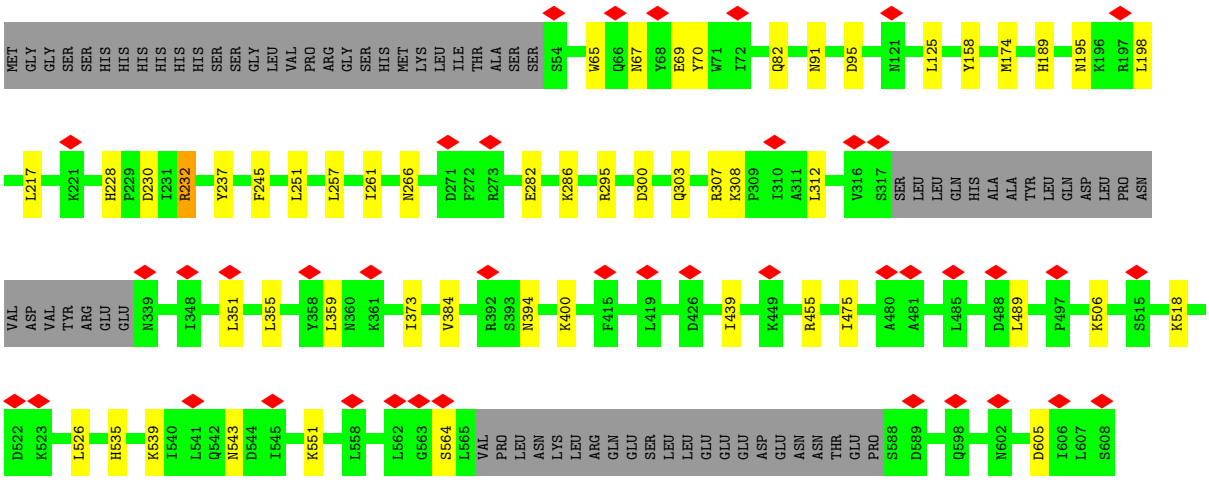
• Molecule 1: Centromere DNA-binding protein complex CBF3 subunit B

Chain A:



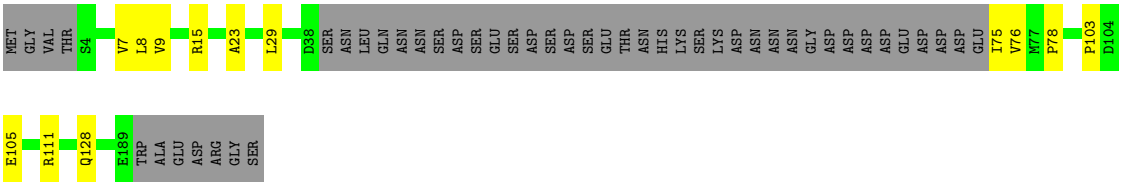
• Molecule 1: Centromere DNA-binding protein complex CBF3 subunit B

Chain B:



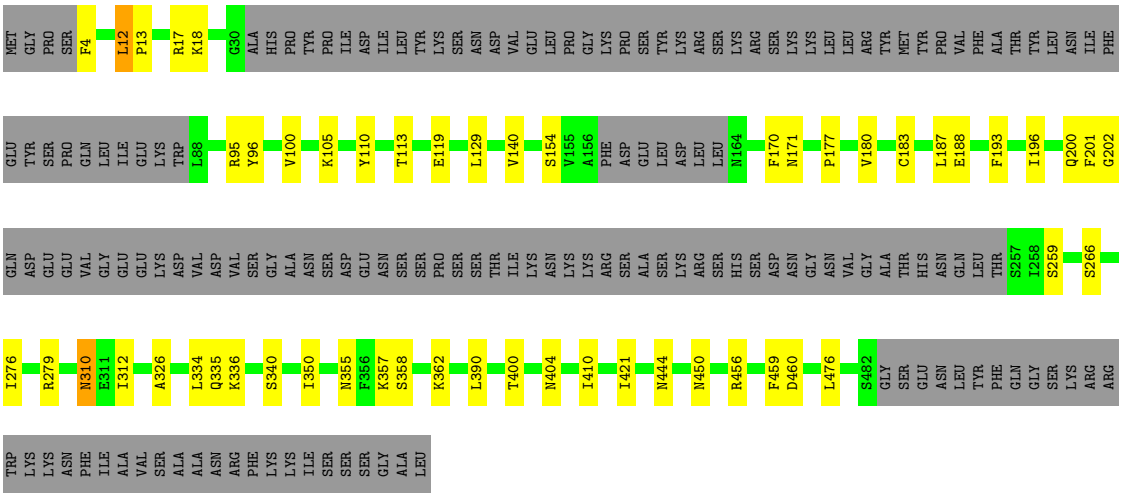
• Molecule 2: Suppressor of kinetochore protein 1

Chain C:



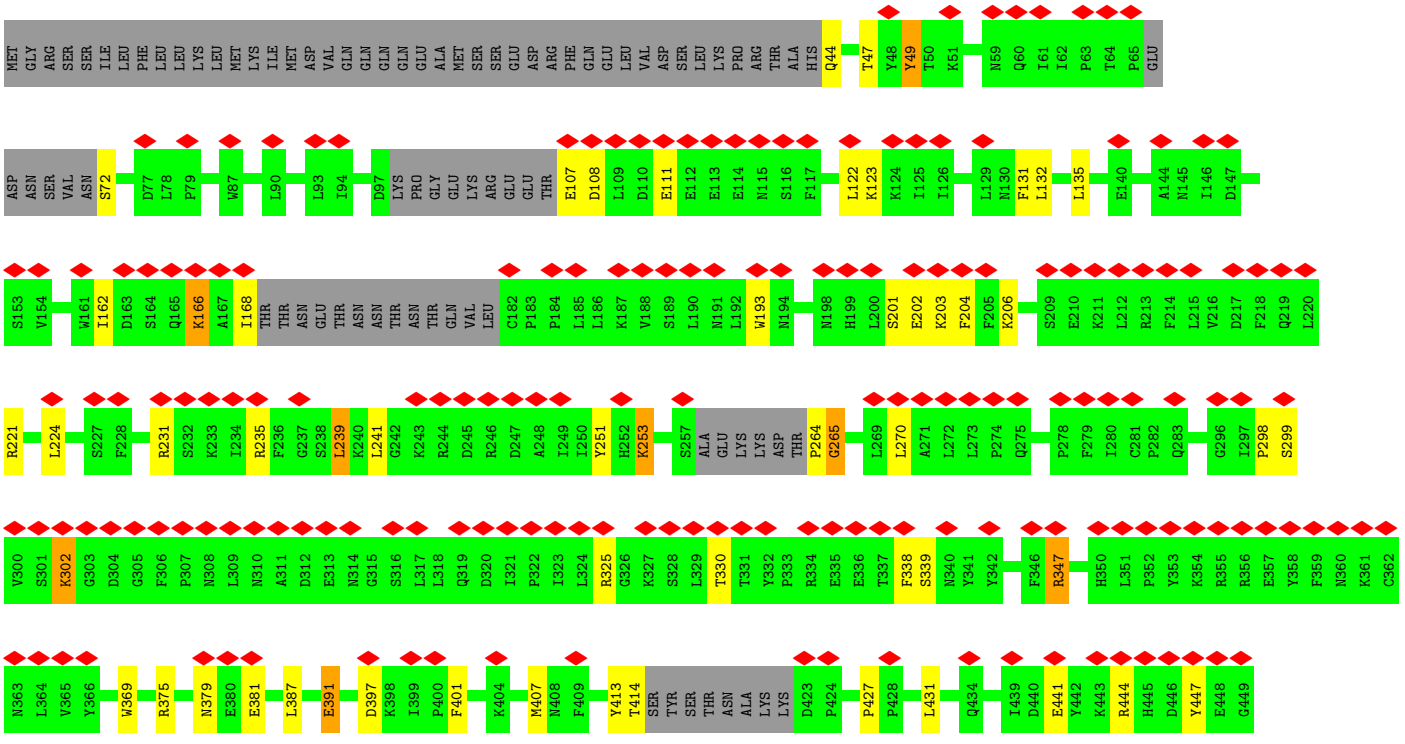
• Molecule 3: Centromere DNA-binding protein complex CBF3 subunit C

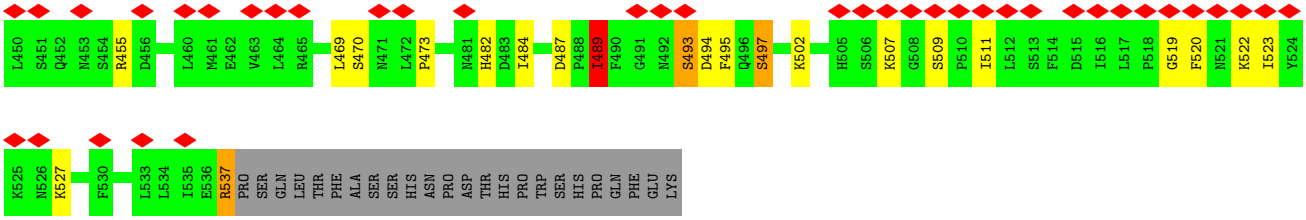
Chain D:



• Molecule 4: Centromere DNA-binding protein complex CBF3 subunit A

Chain E:




L450 S451 Q452 N453 S454 R455 D456 L460 M461 E462 V463 L464 R465 L469 S470 N471 L472 P473 N481 H482 D483 I484 D487 P488 I489 F490 G491 N492 S493 D494 F495 Q496 S497 K502 H505 S506 K507 G508 S509 P510 I511 L512 S513 F514 D515 I516 L517 P518 G519 F520 N521 K522 I523 Y524
K525 N526 K527 F530 L533 L534 I535 E536 R537 PRO SER GLN LEU THR PHE ALA SER SER HIS ASN PRO ASP THR HIS PRO TRP SER HIS PRO GLN PHE GLU LYS

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	56509	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	50	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	47170	Depositor
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.092	Depositor
Minimum map value	-0.027	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.004	Depositor
Recommended contour level	0.0174	Depositor
Map size (Å)	271.36, 271.36, 271.36	wwPDB
Map dimensions	256, 256, 256	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.06, 1.06, 1.06	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	0.31	0/4425	0.51	1/5995 (0.0%)
1	B	0.28	0/4353	0.48	0/5894
2	C	0.26	0/1156	0.49	0/1571
3	D	0.28	0/2832	0.61	2/3851 (0.1%)
4	E	1.05	3/3908 (0.1%)	1.05	13/5297 (0.2%)
All	All	0.57	3/16674 (0.0%)	0.68	16/22608 (0.1%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
3	D	0	1

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	E	369	TRP	CD2-CE2	6.71	1.49	1.41
4	E	193	TRP	CD2-CE2	5.50	1.48	1.41
4	E	401	PHE	CB-CG	-5.24	1.42	1.51

All (16) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	E	407	MET	CG-SD-CE	-14.96	76.26	100.20
4	E	231	ARG	NE-CZ-NH1	10.22	125.41	120.30
4	E	347	ARG	NE-CZ-NH1	8.70	124.65	120.30
4	E	221	ARG	NE-CZ-NH1	8.55	124.57	120.30
4	E	231	ARG	NE-CZ-NH2	-7.71	116.44	120.30
4	E	235	ARG	NE-CZ-NH1	6.61	123.61	120.30
3	D	12	LEU	CA-CB-CG	6.39	130.01	115.30
4	E	235	ARG	NE-CZ-NH2	-6.39	117.11	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	E	122	LEU	CB-CG-CD1	-6.33	100.24	111.00
4	E	241	LEU	CB-CG-CD1	-6.06	100.69	111.00
1	A	558	LEU	CA-CB-CG	5.86	128.79	115.30
3	D	390	LEU	CA-CB-CG	5.21	127.29	115.30
4	E	123	LYS	CD-CE-NZ	-5.15	99.85	111.70
4	E	325	ARG	NE-CZ-NH1	5.13	122.86	120.30
4	E	347	ARG	NE-CZ-NH2	-5.06	117.77	120.30
4	E	239	LEU	CB-CG-CD2	5.04	119.56	111.00

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
3	D	450	ASN	Peptide

5.2 Too-close contacts (i)

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	4320	0	4272	33	0
1	B	4249	0	4208	28	0
2	C	1137	0	1071	8	0
3	D	2773	0	2669	30	0
4	E	3793	0	3693	43	0
All	All	16272	0	15913	135	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 4.

All (135) 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)
4:E:537:ARG:HB3	4:E:537:ARG:NH1	1.79	0.97
4:E:482:HIS:HD2	4:E:484:ILE:H	1.33	0.76
4:E:509:SER:O	4:E:527:LYS:HE2	1.85	0.76

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:E:537:ARG:HB3	4:E:537:ARG:HH11	1.53	0.71
4:E:379:ASN:HD21	4:E:381:GLU:HG3	1.58	0.69
4:E:379:ASN:ND2	4:E:381:GLU:HG3	2.09	0.68
4:E:537:ARG:HB3	4:E:537:ARG:CZ	2.25	0.65
4:E:202:GLU:O	4:E:206:LYS:HG3	1.97	0.65
4:E:482:HIS:CD2	4:E:484:ILE:HG12	2.32	0.65
4:E:166:LYS:HE3	4:E:166:LYS:HA	1.81	0.62
4:E:493:SER:O	4:E:497:SER:HB2	1.99	0.62
4:E:168:ILE:HG21	4:E:519:GLY:O	1.99	0.61
4:E:298:PRO:HG3	4:E:487:ASP:HA	1.82	0.61
4:E:264:PRO:O	4:E:265:GLY:O	2.19	0.61
1:B:125:LEU:O	1:B:295:ARG:NH1	2.34	0.61
4:E:414:THR:O	4:E:414:THR:HG22	2.01	0.61
3:D:188:GLU:HA	3:D:193:PHE:HB2	1.82	0.60
3:D:171:ASN:HA	3:D:200:GLN:HB2	1.84	0.60
1:A:123:GLY:O	1:A:127:PHE:HB2	2.03	0.58
4:E:487:ASP:OD1	4:E:489:ILE:HB	2.03	0.58
4:E:202:GLU:O	4:E:206:LYS:CG	2.52	0.58
1:A:308:LYS:NZ	1:A:310:ILE:O	2.37	0.57
1:B:174:MET:O	1:B:455:ARG:NH1	2.36	0.57
3:D:310:ASN:ND2	3:D:335:GLN:OE1	2.38	0.57
2:C:9:VAL:HB	2:C:78:PRO:HA	1.87	0.56
3:D:105:LYS:HG2	3:D:154:SER:HB2	1.87	0.56
2:C:23:ALA:HB1	2:C:29:LEU:HG	1.87	0.55
3:D:312:ILE:HD12	3:D:334:LEU:HD21	1.89	0.55
3:D:336:LYS:HA	3:D:358:SER:HB3	1.87	0.55
1:B:384:VAL:O	1:B:400:LYS:NZ	2.40	0.54
2:C:7:VAL:HB	2:C:76:VAL:HG22	1.89	0.54
4:E:473:PRO:HG2	4:E:502:LYS:HD3	1.87	0.54
3:D:12:LEU:O	3:D:17:ARG:NH1	2.40	0.54
2:C:105:GLU:O	2:C:111:ARG:NH2	2.41	0.54
3:D:177:PRO:HB3	3:D:259:SER:HB3	1.88	0.53
3:D:12:LEU:HD22	3:D:13:PRO:HD2	1.89	0.53
1:A:189:HIS:O	1:A:196:LYS:NZ	2.43	0.52
1:A:82:GLN:HE22	1:A:551:LYS:HB3	1.75	0.51
1:A:176:VAL:HG21	1:A:201:GLU:HB3	1.92	0.51
3:D:456:ARG:HA	3:D:459:PHE:HB3	1.93	0.51
1:B:70:TYR:HB2	1:B:359:LEU:HB3	1.92	0.51
3:D:400:THR:HG21	3:D:410:ILE:HG12	1.93	0.50
1:A:309:PRO:HG2	1:A:310:ILE:HD12	1.93	0.50
1:B:82:GLN:HE22	1:B:551:LYS:HB3	1.75	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:E:482:HIS:CD2	4:E:484:ILE:H	2.22	0.50
2:C:9:VAL:HG22	2:C:15:ARG:HG2	1.94	0.50
3:D:95:ARG:NH2	3:D:96:TYR:OH	2.45	0.50
1:B:475:ILE:HG12	1:B:518:LYS:HB2	1.94	0.50
1:B:439:ILE:HD11	1:B:489:LEU:HD22	1.94	0.49
1:A:257:LEU:HD21	1:A:300:ASP:HA	1.92	0.49
2:C:75:ILE:HG23	2:C:76:VAL:HG23	1.95	0.49
1:B:91:ASN:ND2	1:B:95:ASP:OD1	2.46	0.49
1:A:211:ASN:OD1	1:A:214:ARG:NH1	2.46	0.48
4:E:537:ARG:HH11	4:E:537:ARG:CB	2.25	0.48
3:D:340:SER:HA	3:D:362:LYS:HB2	1.95	0.48
1:B:251:LEU:HD21	1:B:307:ARG:HD3	1.95	0.48
1:B:237:TYR:OH	1:B:303:GLN:NE2	2.40	0.48
1:B:300:ASP:OD1	1:B:308:LYS:NZ	2.34	0.48
1:A:315:GLU:O	1:A:353:ARG:NH2	2.43	0.48
1:B:257:LEU:HD23	1:B:308:LYS:HE3	1.95	0.48
4:E:203:LYS:HE3	4:E:204:PHE:CZ	2.49	0.48
1:A:339:ASN:ND2	3:D:460:ASP:OD2	2.43	0.48
1:B:282:GLU:HG2	1:B:286:LYS:HE2	1.94	0.48
4:E:509:SER:OG	4:E:511:ILE:HG22	2.14	0.48
1:A:174:MET:O	1:A:455:ARG:NH1	2.44	0.47
1:B:351:LEU:HD11	1:B:373:ILE:HG23	1.96	0.47
4:E:270:LEU:HD12	4:E:270:LEU:N	2.29	0.47
1:A:70:TYR:HB2	1:A:359:LEU:HB3	1.97	0.47
1:A:368:LYS:HD3	3:D:113:THR:HG21	1.96	0.47
1:A:139:ARG:NH2	1:B:564:SER:OG	2.48	0.47
1:A:83:ARG:HH21	1:A:251:LEU:HD21	1.80	0.47
1:A:238:LEU:HD22	1:A:295:ARG:HG3	1.96	0.47
1:A:439:ILE:HD11	1:A:489:LEU:HD22	1.97	0.47
1:A:280:PRO:HB3	3:D:421:ILE:HG13	1.97	0.47
1:A:503:LYS:NZ	1:A:608:SER:OG	2.43	0.47
4:E:168:ILE:HD11	4:E:520:PHE:CE2	2.50	0.47
1:A:351:LEU:HD12	1:A:373:ILE:HG23	1.96	0.46
4:E:107:GLU:HG2	4:E:111:GLU:HB2	1.97	0.46
1:A:467:VAL:HG23	1:A:489:LEU:HB3	1.98	0.46
4:E:251:TYR:CZ	4:E:253:LYS:HG2	2.51	0.46
1:A:264:PHE:HZ	1:A:272:PHE:HZ	1.63	0.46
3:D:326:ALA:HB3	3:D:350:ILE:HG12	1.98	0.46
3:D:456:ARG:HG2	3:D:460:ASP:HB2	1.98	0.46
1:A:307:ARG:NE	1:B:266:ASN:OD1	2.43	0.46
4:E:431:LEU:HD21	4:E:494:ASP:HB2	1.96	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:83:ARG:HE	1:A:251:LEU:HD21	1.81	0.45
1:A:280:PRO:HG3	3:D:421:ILE:HG21	1.98	0.45
4:E:489:ILE:HG23	4:E:495:PHE:CE2	2.51	0.45
1:B:230:ASP:OD2	1:B:232:ARG:NH2	2.45	0.45
1:A:539:LYS:HE3	1:A:543:ASN:HD21	1.81	0.45
3:D:193:PHE:HZ	3:D:266:SER:HB2	1.82	0.45
4:E:391:GLU:OE2	4:E:397:ASP:N	2.48	0.45
1:A:217:LEU:HD23	1:A:220:LEU:HD12	1.99	0.45
1:B:158:TYR:OH	1:B:228:HIS:O	2.32	0.44
2:C:8:LEU:HD21	2:C:29:LEU:HD21	1.99	0.44
4:E:509:SER:O	4:E:527:LYS:CE	2.61	0.44
3:D:119:GLU:O	3:D:129:LEU:HA	2.18	0.44
3:D:177:PRO:HA	3:D:180:VAL:HB	1.98	0.44
3:D:183:CYS:O	3:D:187:LEU:HB2	2.17	0.44
1:A:332:VAL:HG13	1:A:336:ARG:HH22	1.82	0.44
4:E:162:ILE:HD11	4:E:413:TYR:CE2	2.53	0.43
3:D:444:ASN:OD1	3:D:444:ASN:N	2.51	0.43
4:E:131:PHE:CE2	4:E:135:LEU:HD22	2.53	0.43
1:B:195:ASN:HB3	1:B:198:LEU:HG	2.00	0.43
3:D:100:VAL:HG11	3:D:140:VAL:HG11	2.00	0.43
3:D:170:PHE:HB2	3:D:196:ILE:HD11	2.01	0.43
3:D:202:GLY:HA3	3:D:279:ARG:HB2	2.00	0.43
1:A:64:PHE:HE2	1:A:541:LEU:HB3	1.82	0.43
4:E:224:LEU:HD22	4:E:270:LEU:HB3	2.01	0.43
4:E:379:ASN:HD21	4:E:381:GLU:CG	2.30	0.43
1:A:261:ILE:HG23	1:A:312:LEU:HD13	2.00	0.43
1:B:355:LEU:HD21	1:B:373:ILE:HG21	2.00	0.43
4:E:447:TYR:CE1	4:E:455:ARG:HG2	2.54	0.43
3:D:18:LYS:HE3	3:D:110:TYR:HE2	1.84	0.42
1:A:69:GLU:O	1:A:73:THR:OG1	2.34	0.42
1:A:199:ASN:H	1:A:202:ASP:HB2	1.84	0.42
4:E:427:PRO:HB3	4:E:469:LEU:HG	2.01	0.42
1:B:189:HIS:CE1	1:B:198:LEU:HB2	2.55	0.41
1:B:261:ILE:HG23	1:B:312:LEU:HD13	2.01	0.41
2:C:128:GLN:HE22	3:D:4:PHE:HA	1.85	0.41
4:E:511:ILE:HD13	4:E:511:ILE:HG21	1.70	0.41
4:E:523:ILE:H	4:E:523:ILE:HG12	1.66	0.41
4:E:49:TYR:HB2	4:E:132:LEU:HD22	2.03	0.41
4:E:302:LYS:HE3	4:E:302:LYS:HB2	1.51	0.41
1:B:526:LEU:HA	1:B:535:HIS:HD2	1.85	0.41
3:D:201:PHE:HE2	3:D:276:ILE:HD12	1.85	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:E:441:GLU:HG3	4:E:444:ARG:HH21	1.85	0.41
4:E:387:LEU:HA	4:E:387:LEU:HD12	1.88	0.41
1:A:96:THR:O	1:A:100:MET:HB2	2.20	0.41
1:B:506:LYS:NZ	1:B:605:ASP:O	2.46	0.41
1:B:539:LYS:HE3	1:B:543:ASN:HD21	1.86	0.41
1:B:257:LEU:HD21	1:B:300:ASP:HA	2.02	0.41
4:E:441:GLU:HG3	4:E:444:ARG:NH2	2.36	0.41
1:B:217:LEU:HD11	1:B:245:PHE:HZ	1.86	0.40
1:B:65:TRP:NE1	1:B:69:GLU:OE1	2.54	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	518/584 (89%)	500 (96%)	18 (4%)	0	100	100
1	B	506/584 (87%)	492 (97%)	14 (3%)	0	100	100
2	C	146/197 (74%)	138 (94%)	7 (5%)	1 (1%)	19	56
3	D	353/519 (68%)	307 (87%)	46 (13%)	0	100	100
4	E	440/562 (78%)	421 (96%)	16 (4%)	3 (1%)	19	56
All	All	1963/2446 (80%)	1858 (95%)	101 (5%)	4 (0%)	45	77

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
4	E	265	GLY
4	E	201	SER
4	E	489	ILE
2	C	103	PRO

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	481/543 (89%)	478 (99%)	3 (1%)	84 88
1	B	475/543 (88%)	472 (99%)	3 (1%)	84 88
2	C	116/180 (64%)	116 (100%)	0	100 100
3	D	271/481 (56%)	266 (98%)	5 (2%)	54 71
4	E	427/530 (81%)	404 (95%)	23 (5%)	18 42
All	All	1770/2277 (78%)	1736 (98%)	34 (2%)	52 69

All (34) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	67	ASN
1	A	232	ARG
1	A	353	ARG
1	B	67	ASN
1	B	232	ARG
1	B	394	ASN
3	D	310	ASN
3	D	355	ASN
3	D	357	LYS
3	D	404	ASN
3	D	476	LEU
4	E	44	GLN
4	E	47	THR
4	E	49	TYR
4	E	72	SER
4	E	108	ASP
4	E	166	LYS
4	E	239	LEU
4	E	253	LYS
4	E	299	SER
4	E	302	LYS
4	E	330	THR
4	E	338	PHE

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Mol	Chain	Res	Type
4	E	339	SER
4	E	347	ARG
4	E	375	ARG
4	E	391	GLU
4	E	470	SER
4	E	489	ILE
4	E	493	SER
4	E	497	SER
4	E	507	LYS
4	E	522	LYS
4	E	537	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (20) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	67	ASN
1	A	82	GLN
1	A	189	HIS
1	A	461	GLN
1	A	543	ASN
1	A	598	GLN
1	B	67	ASN
1	B	82	GLN
1	B	394	ASN
1	B	399	GLN
1	B	543	ASN
2	C	128	GLN
3	D	169	GLN
3	D	310	ASN
3	D	335	GLN
3	D	355	ASN
3	D	404	ASN
3	D	443	GLN
4	E	379	ASN
4	E	482	HIS

5.3.3 RNA

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 oligosaccharides 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.

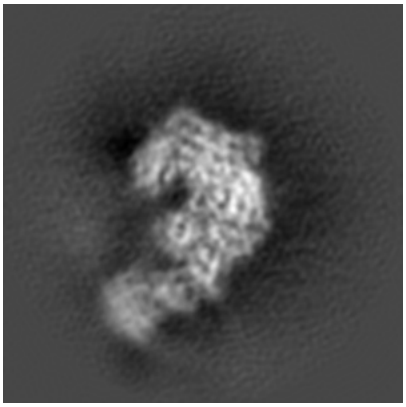
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-0051. These allow visual inspection of the internal detail of the map and identification of artifacts.

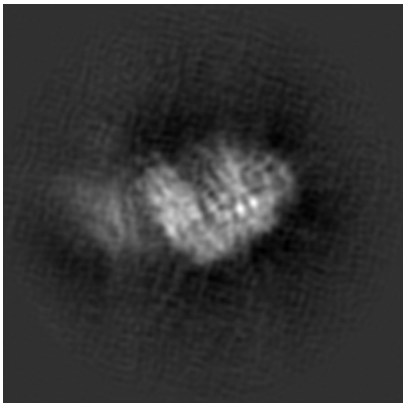
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections

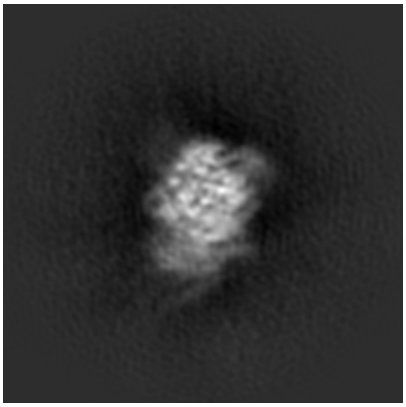
6.1.1 Primary map



X



Y

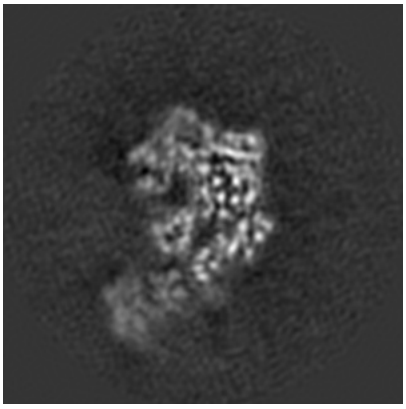


Z

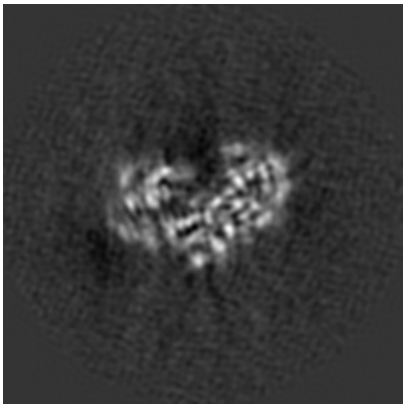
The images above show the map projected in three orthogonal directions.

6.2 Central slices

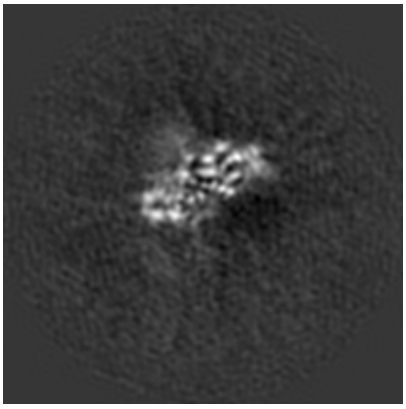
6.2.1 Primary map



X Index: 128



Y Index: 128

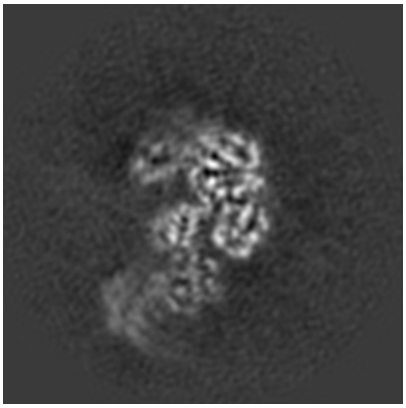


Z Index: 128

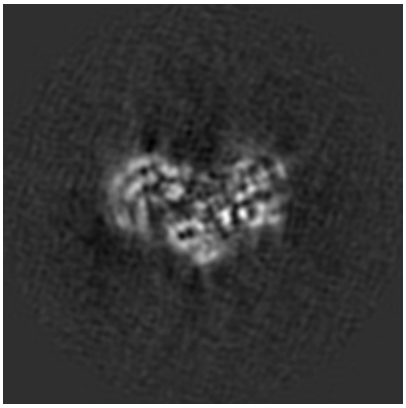
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

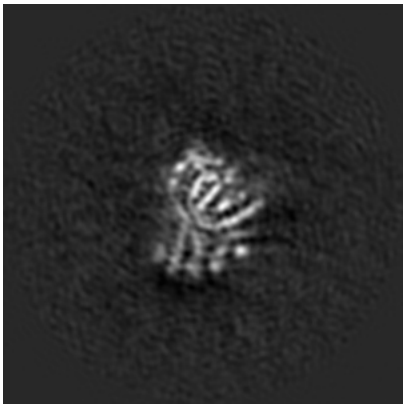
6.3.1 Primary map



X Index: 121



Y Index: 133

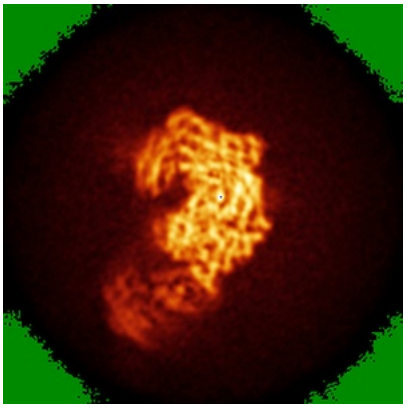


Z Index: 151

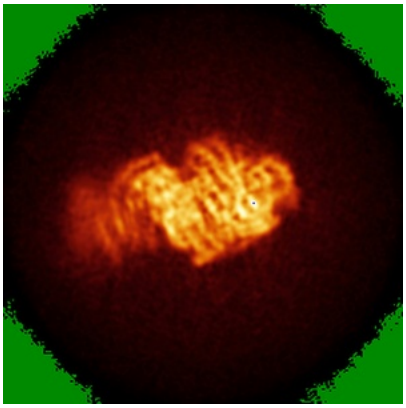
The images above show the largest variance slices of the map in three orthogonal directions.

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

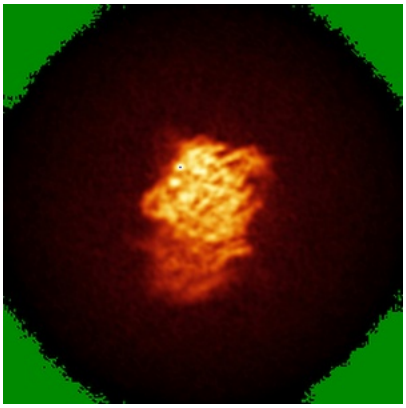
6.4.1 Primary map



X



Y



Z

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 0.0174. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

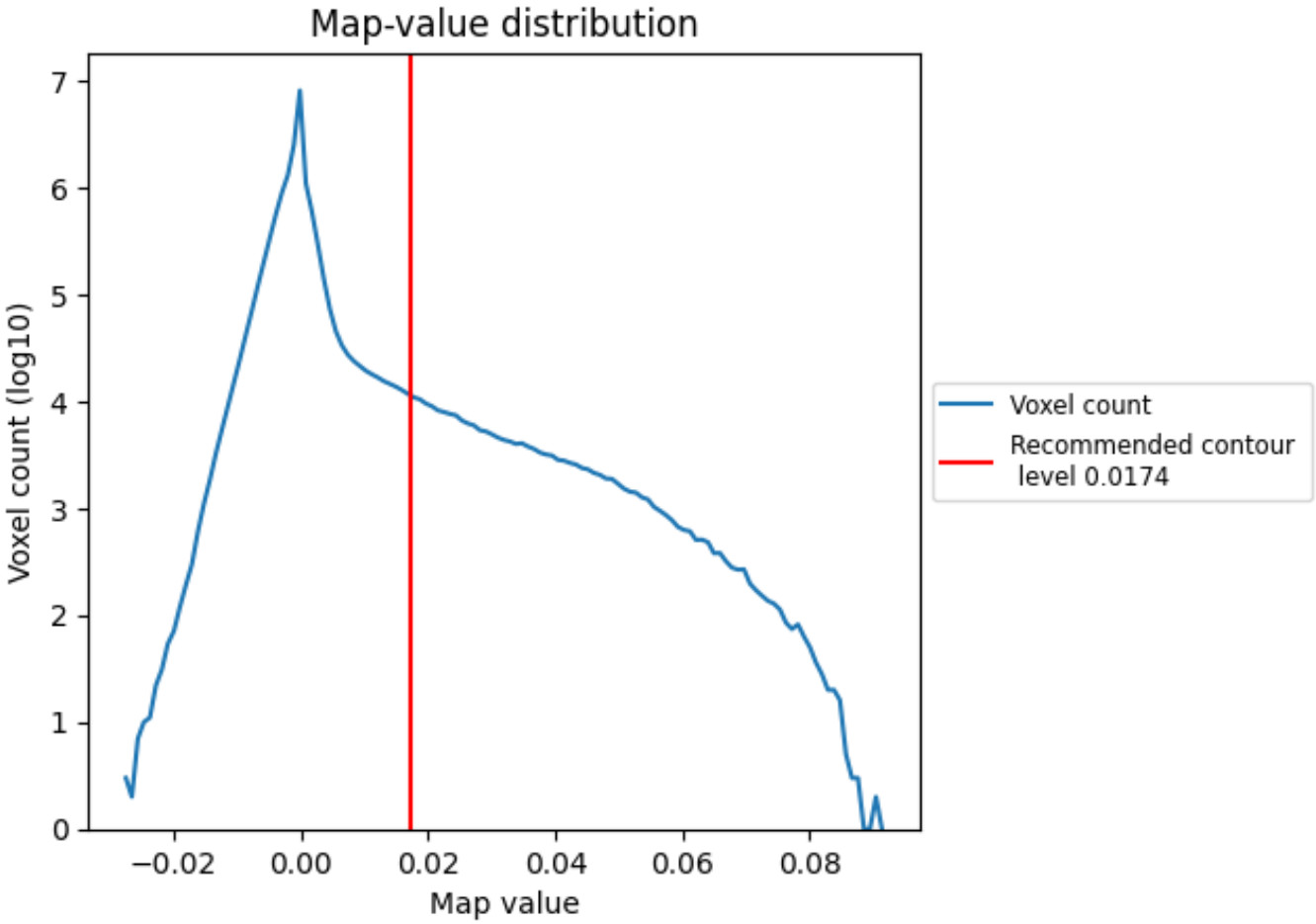
6.6 Mask visualisation (i)

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

7 Map analysis

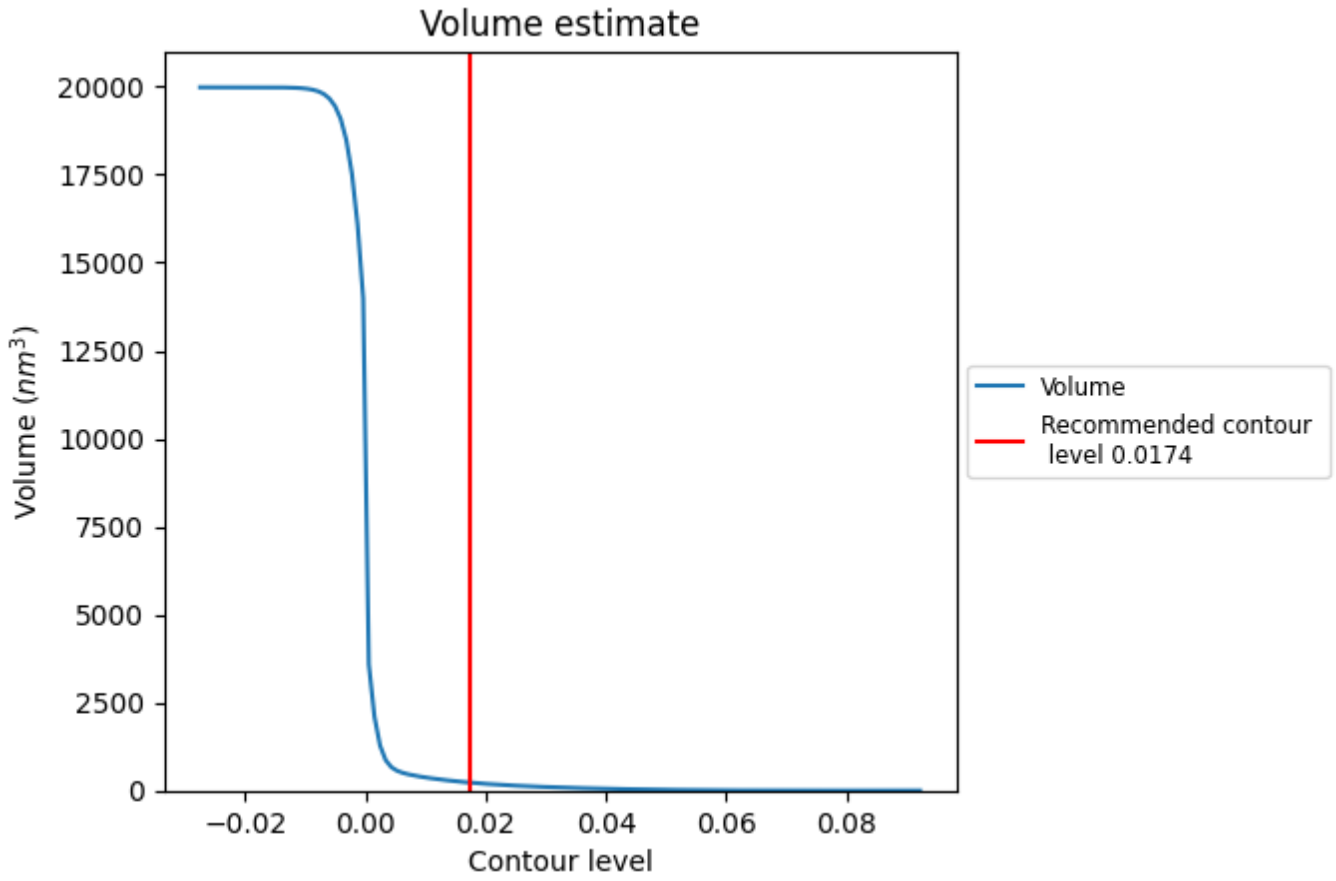
This section contains the results of statistical analysis of the map.

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.

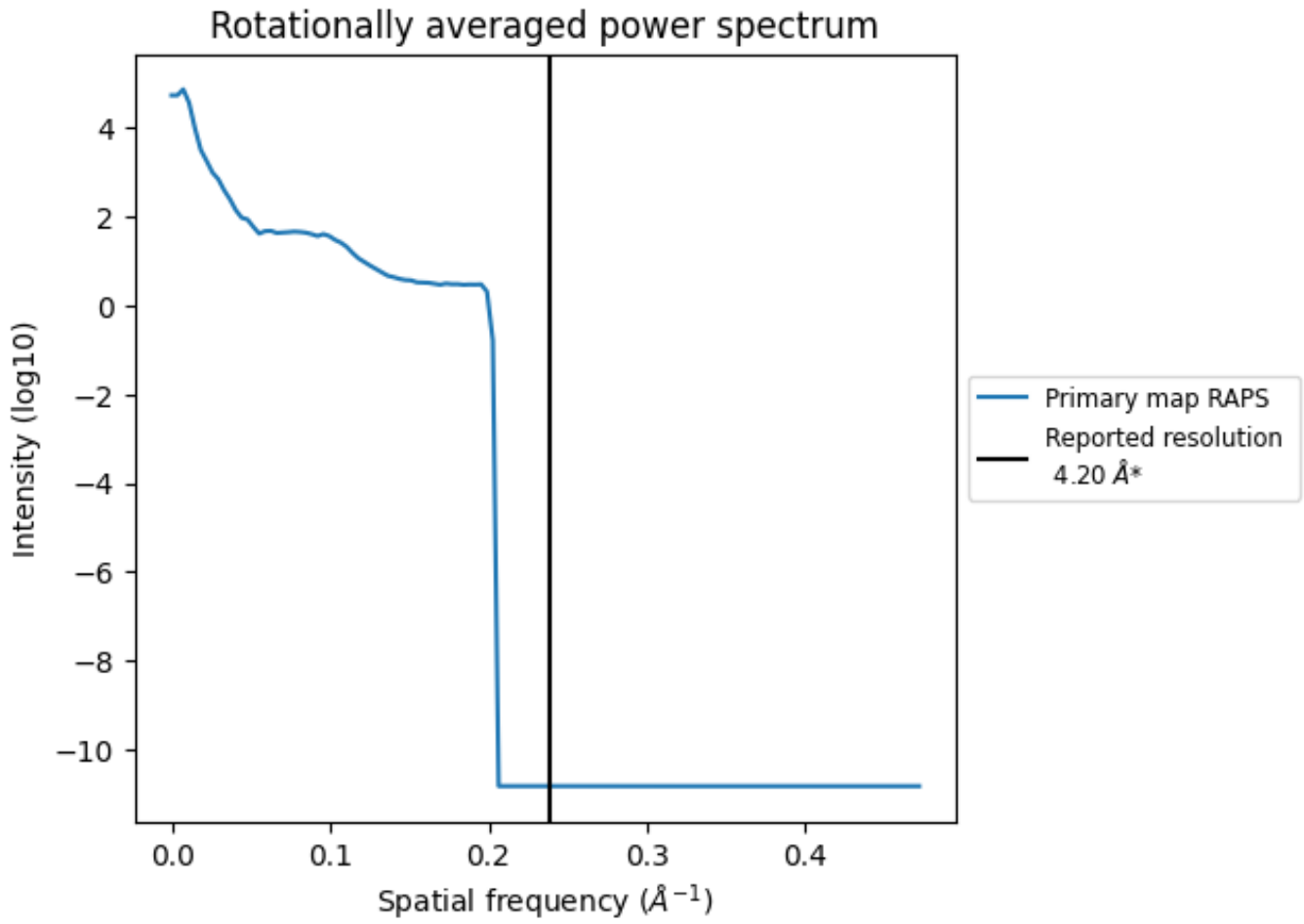
7.2 Volume estimate (i)



The volume at the recommended contour level is 227 nm^3; this corresponds to an approximate mass of 205 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)

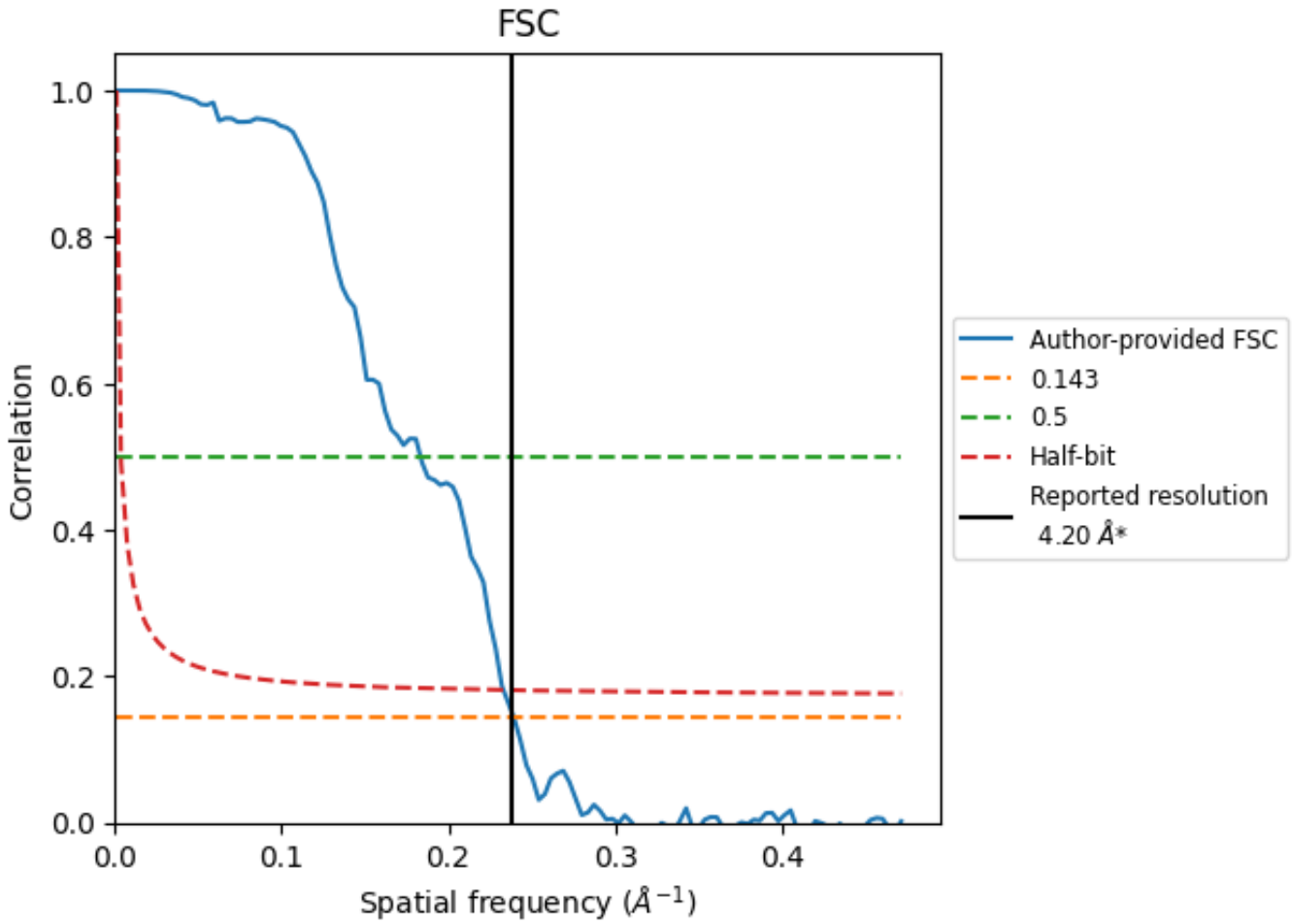


*Reported resolution corresponds to spatial frequency of 0.238 Å^{-1}

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 0.238 Å^{-1}

8.2 Resolution estimates (i)

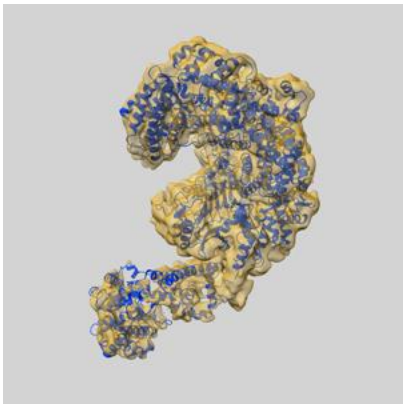
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	4.20	-	-
Author-provided FSC curve	4.18	5.46	4.29
Unmasked-calculated*	-	-	-

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

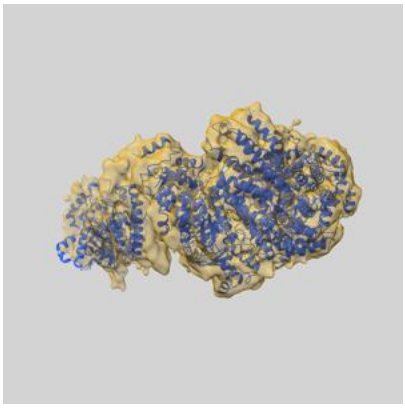
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-0051 and PDB model 6GSA. Per-residue inclusion information can be found in section 3 on page 7.

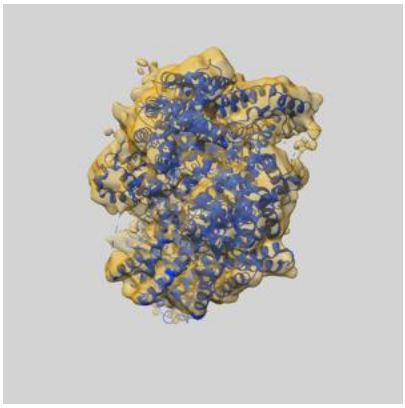
9.1 Map-model overlay



X



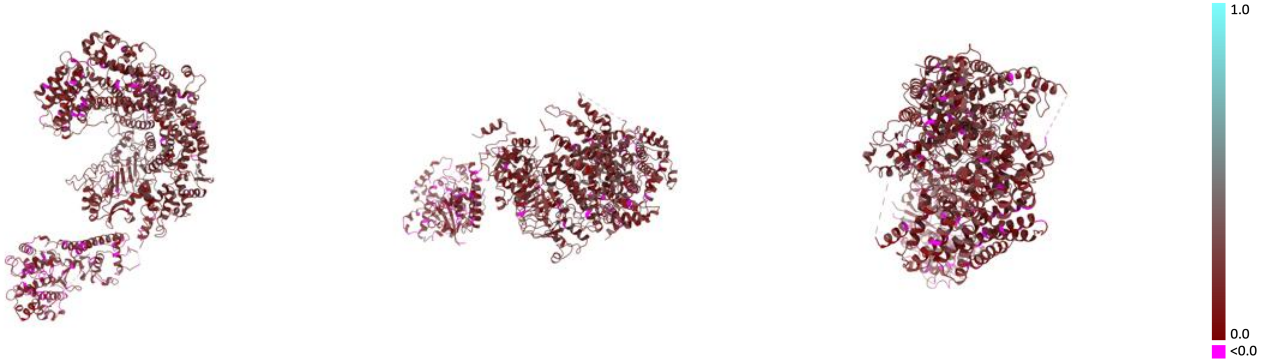
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.0174 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.

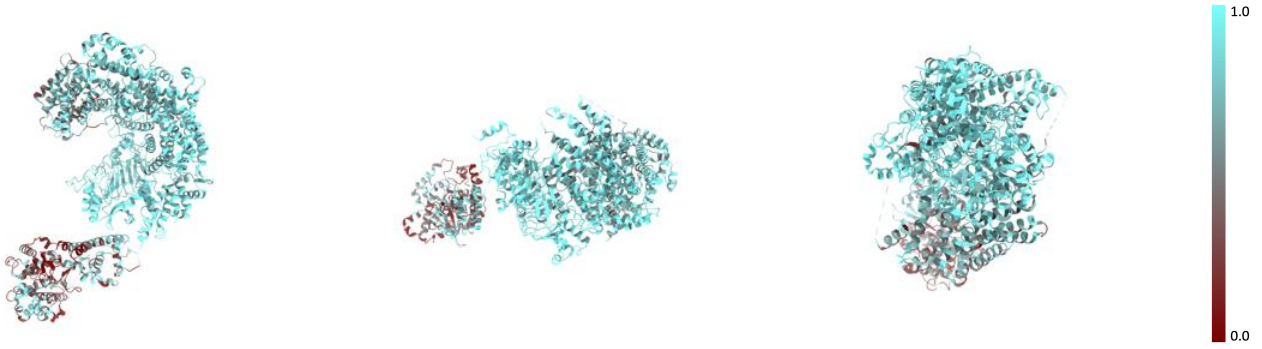
9.2 Q-score mapped to coordinate model (i)



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.

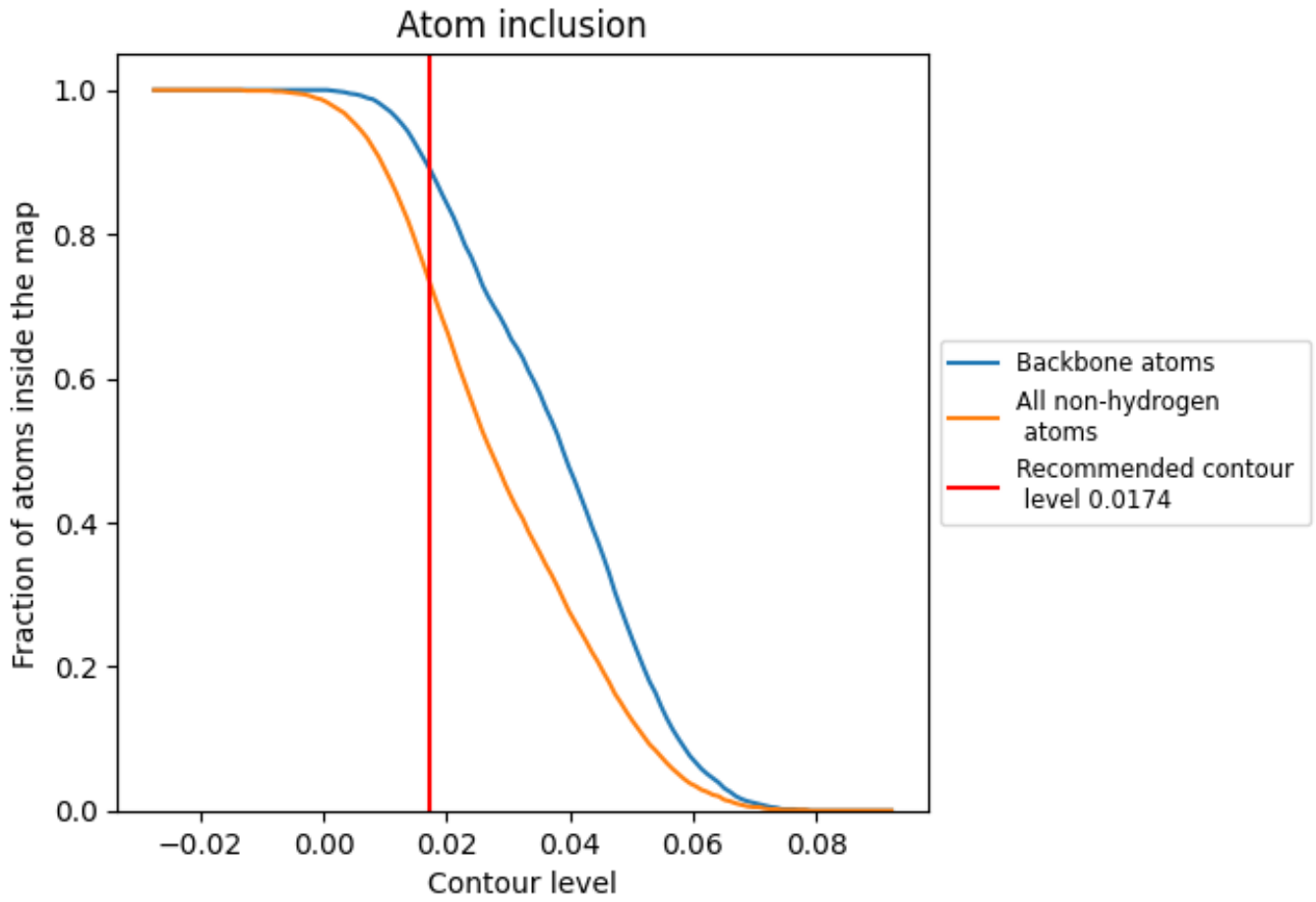
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.0174).

9.4 Atom inclusion (i)



At the recommended contour level, 89% of all backbone atoms, 73% 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 (0.0174) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7310	0.1830
A	0.8480	0.2050
B	0.7300	0.1830
C	0.8950	0.2210
D	0.9020	0.2140
E	0.4250	0.1240