Full wwPDB EM Validation Report ⓘ

Jan 23, 2025 – 02:13 PM EST

PDB ID	:	9C0F
EMDB ID	:	EMD-45082
Title	:	piggyBat transposase protein-DNA complex
Authors	:	Lannes, L.; Hickman, A.B.; Dyda, F.
Deposited on	:	2024-05-25
Resolution	:	3.60 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:

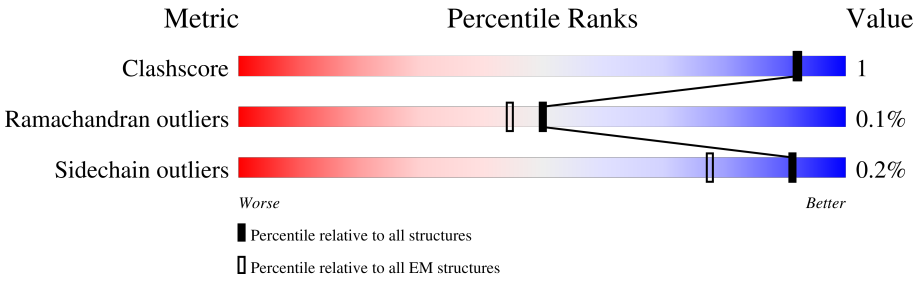
EMDB validation analysis	:	0.0.1.dev113
MolProbity	:	4.02b-467
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.40

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 3.60 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	35	66% 29% 6%
2	B	35	40% 60%
3	C	578	70% 11% 19%
3	D	578	76% 10% 13%

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 9507 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 DNA chain called DNA (35-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	A	35	725	343	137	210	35	0	0

- Molecule 2 is a DNA chain called DNA (35-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
2	B	35	710	338	127	210	35	0	0

- Molecule 3 is a protein called piggyBat transposase.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	C	466	3883	2491	681	682	29	0	0
3	D	504	Total	C	N	O	S	0	0
			4185	2673	737	744	31		

- Molecule 4 is ZINC ION (three-letter code: ZN) (formula: Zn) (labeled as "Ligand of Interest" by depositor).

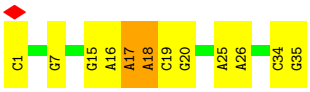
Mol	Chain	Residues	Atoms		AltConf
			Total	Zn	
4	C	2	2	2	0
4	D	2	Total	Zn	0
			2	2	

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: DNA (35-MER)

Chain A:

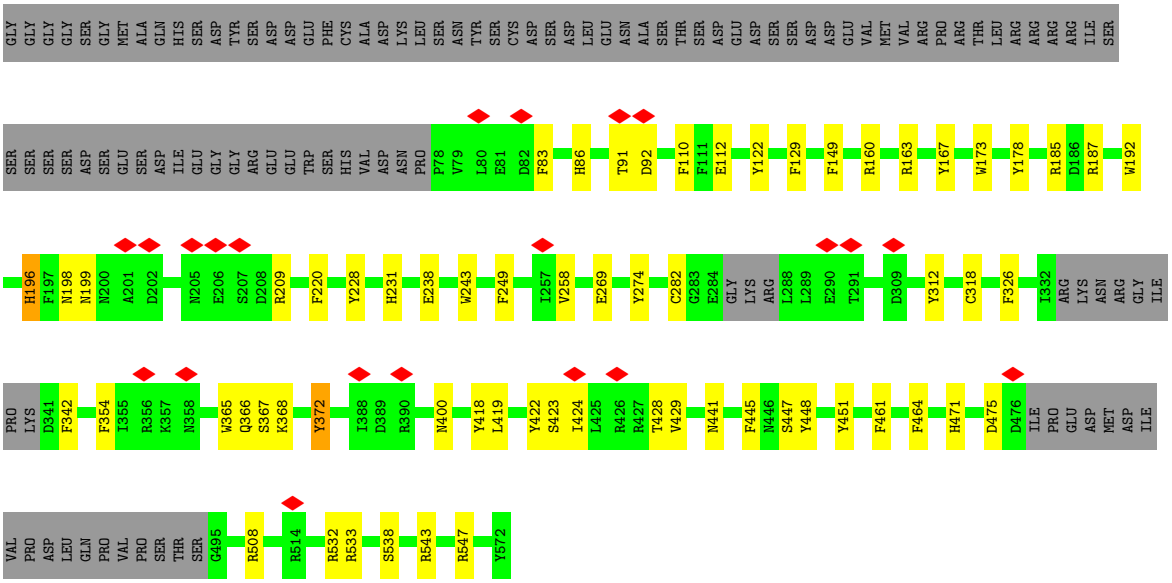


• Molecule 2: DNA (35-MER)

Chain B:

• Molecule 3: piggyBat transposase

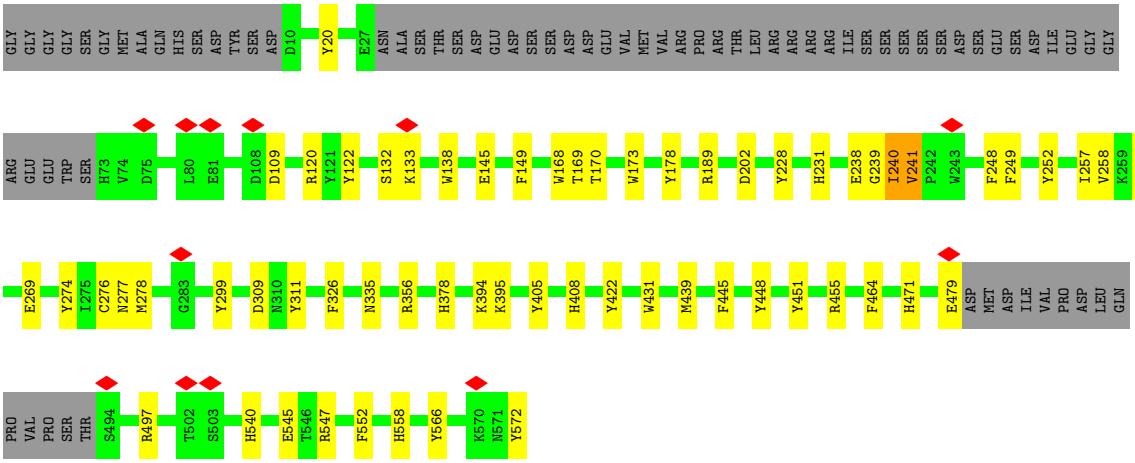
Chain C:



• Molecule 3: piggyBat transposase

Chain D:


76%
10%
13%


GLY GLY GLY GLY SER GLY MET ALA GLN HIS SER ASP TYR SER ASP D10 Y20 E27 ASN ALA SER THR SER ASP GLU ASP SER SER ASP ASP GLU VAL MET VAL ARG PRO ARG THR LEU ARG ARG ARG ILE SER SER SER SER SER ASP SER GLU SER ASP ILE GLU GLY GLY
ARG GLU GLU TRP SER H73 V74 D75 L80 E81 D108 D109 R120 Y121 Y122 S132 K133 W138 E145 F149 W168 T169 T170 W173 Y178 R189 D202 Y228 H231 E238 G239 I240 V241 P242 W243 F248 F249 Y252 I257 V258 K259 Y260
E269 Y274 I275 C276 N277 M278 G283 Y299 D309 N310 Y311 F326 N335 R356 H378 K394 K395 Y405 H408 Y422 W431 M439 F445 Y448 Y451 R455 F464 H471 E479 ASP MET ASP ILE VAL PRO ASP LEU GLN
PRO VAL PRO SER THR S494 R497 T502 S503 H540 E545 T546 R547 F552 H558 Y566 K570 N571 Y572

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	162244	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 ($e^-/Å^2$)	16.4	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.020	Depositor
Minimum map value	-0.007	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.001	Depositor
Recommended contour level	0.004	Depositor
Map size (Å)	206.40001, 206.40001, 206.40001	wwPDB
Map dimensions	240, 240, 240	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.86, 0.86, 0.86	Depositor

5 Model quality (i)

5.1 Standard geometry (i)

Bond lengths and bond angles in the following residue types are not validated in this section: ZN

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	1.78	10/814 (1.2%)	1.82	29/1256 (2.3%)
2	B	1.83	13/794 (1.6%)	1.98	37/1221 (3.0%)
3	C	1.50	53/3974 (1.3%)	1.04	12/5346 (0.2%)
3	D	1.51	54/4283 (1.3%)	1.06	14/5764 (0.2%)
All	All	1.56	130/9865 (1.3%)	1.25	92/13587 (0.7%)

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
1	A	0	2

All (130) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	D	464	PHE	CB-CG	-12.07	1.30	1.51
1	A	1	DC	N1-C6	11.52	1.44	1.37
2	B	-35	DC	N1-C6	11.25	1.44	1.37
3	C	372	TYR	CB-CG	-11.17	1.34	1.51
3	C	464	PHE	CB-CG	-10.94	1.32	1.51
2	B	-1	DG	N3-C4	10.18	1.42	1.35
3	D	431	TRP	CB-CG	-9.66	1.32	1.50
1	A	35	DG	N3-C4	9.55	1.42	1.35
3	C	274	TYR	CB-CG	-9.19	1.37	1.51
3	D	168	TRP	CB-CG	-9.17	1.33	1.50
3	C	228	TYR	CB-CG	-9.15	1.38	1.51
3	D	572	TYR	CE2-CZ	8.90	1.50	1.38
3	D	572	TYR	CG-CD2	8.59	1.50	1.39
1	A	1	DC	N1-C2	8.39	1.48	1.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	D	471	HIS	CB-CG	-8.38	1.34	1.50
3	D	572	TYR	CG-CD1	8.23	1.49	1.39
3	D	138	TRP	CB-CG	-8.22	1.35	1.50
3	D	269	GLU	CD-OE2	-8.22	1.16	1.25
3	C	274	TYR	CG-CD1	-8.21	1.28	1.39
3	D	422	TYR	CB-CG	-8.12	1.39	1.51
3	C	372	TYR	CD2-CE2	-7.95	1.27	1.39
3	C	274	TYR	CG-CD2	-7.95	1.28	1.39
3	C	312	TYR	CB-CG	-7.91	1.39	1.51
3	C	282	CYS	CB-SG	-7.62	1.69	1.82
3	D	572	TYR	CB-CG	7.47	1.62	1.51
3	C	274	TYR	CE1-CZ	-7.36	1.28	1.38
3	D	276	CYS	CB-SG	-7.33	1.69	1.82
3	D	260	TYR	CB-CG	-7.25	1.40	1.51
3	C	445	PHE	CB-CG	-7.21	1.39	1.51
3	D	572	TYR	CD2-CE2	7.19	1.50	1.39
3	D	448	TYR	CB-CG	-7.15	1.41	1.51
3	C	448	TYR	CB-CG	-7.09	1.41	1.51
1	A	35	DG	C5-C6	7.08	1.49	1.42
3	C	192	TRP	CB-CG	-7.08	1.37	1.50
3	D	249	PHE	CB-CG	-7.06	1.39	1.51
3	C	231	HIS	CB-CG	-6.99	1.37	1.50
3	D	248	PHE	CB-CG	-6.98	1.39	1.51
3	D	448	TYR	CG-CD1	-6.94	1.30	1.39
2	B	-35	DC	N1-C2	6.90	1.47	1.40
3	C	149	PHE	CB-CG	-6.86	1.39	1.51
3	D	228	TYR	CB-CG	-6.86	1.41	1.51
2	B	-1	DG	C2-N3	6.84	1.38	1.32
2	B	-1	DG	C5-C6	6.74	1.49	1.42
2	B	-33	DA	N9-C4	-6.72	1.33	1.37
3	C	243	TRP	NE1-CE2	-6.63	1.28	1.37
3	C	274	TYR	CD1-CE1	-6.59	1.29	1.39
3	C	192	TRP	CD2-CE2	-6.55	1.33	1.41
3	C	178	TYR	CB-CG	-6.47	1.42	1.51
3	D	445	PHE	CB-CG	-6.39	1.40	1.51
3	C	173	TRP	NE1-CE2	-6.37	1.29	1.37
3	C	274	TYR	CE2-CZ	-6.35	1.30	1.38
3	C	228	TYR	CG-CD2	-6.29	1.30	1.39
2	B	-11	DC	N1-C6	-6.27	1.33	1.37
3	D	558	HIS	CB-CG	-6.26	1.38	1.50
3	C	274	TYR	CD2-CE2	-6.24	1.29	1.39
1	A	35	DG	C2-N3	6.23	1.37	1.32

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	1	DC	C5-C6	6.17	1.39	1.34
3	C	354	PHE	CB-CG	-6.14	1.41	1.51
3	D	274	TYR	CG-CD2	-6.13	1.31	1.39
3	C	372	TYR	CG-CD2	-6.13	1.31	1.39
2	B	-1	DG	C5-C4	6.08	1.42	1.38
3	C	228	TYR	CG-CD1	-6.02	1.31	1.39
3	C	173	TRP	CD2-CE2	-6.00	1.34	1.41
3	C	220	PHE	CB-CG	-5.98	1.41	1.51
3	C	167	TYR	CG-CD2	-5.93	1.31	1.39
3	C	418	TYR	CB-CG	-5.93	1.42	1.51
3	C	471	HIS	CB-CG	-5.88	1.39	1.50
3	C	238	GLU	CG-CD	-5.88	1.43	1.51
3	D	408	HIS	CB-CG	-5.88	1.39	1.50
1	A	35	DG	C5-C4	5.81	1.42	1.38
3	D	464	PHE	CG-CD2	-5.79	1.30	1.38
3	D	228	TYR	CG-CD1	-5.78	1.31	1.39
3	D	545	GLU	CD-OE1	-5.77	1.19	1.25
3	C	269	GLU	CD-OE2	-5.77	1.19	1.25
3	C	86	HIS	CB-CG	-5.76	1.39	1.50
3	D	566	TYR	CB-CG	-5.71	1.43	1.51
3	D	20	TYR	CG-CD1	-5.67	1.31	1.39
3	C	122	TYR	CB-CG	-5.67	1.43	1.51
3	D	448	TYR	CG-CD2	-5.67	1.31	1.39
3	D	231	HIS	CB-CG	-5.66	1.39	1.50
3	D	448	TYR	CE2-CZ	-5.65	1.31	1.38
3	D	178	TYR	CB-CG	-5.64	1.43	1.51
3	C	129	PHE	CB-CG	-5.63	1.41	1.51
1	A	1	DC	C4-C5	5.63	1.47	1.43
3	C	196	HIS	CB-CG	-5.62	1.40	1.50
3	D	269	GLU	CD-OE1	-5.62	1.19	1.25
3	C	451	TYR	CB-CG	-5.59	1.43	1.51
3	C	318	CYS	CB-SG	-5.57	1.72	1.81
3	C	173	TRP	CE2-CZ2	-5.57	1.30	1.39
3	D	326	PHE	CB-CG	-5.56	1.41	1.51
2	B	-35	DC	C2-N3	5.56	1.40	1.35
3	D	431	TRP	CD2-CE2	-5.55	1.34	1.41
3	C	83	PHE	CB-CG	-5.54	1.42	1.51
3	D	439	MET	CG-SD	-5.53	1.66	1.81
2	B	-28	DA	N9-C4	-5.49	1.34	1.37
3	C	110	PHE	CB-CG	-5.45	1.42	1.51
1	A	1	DC	C2-N3	5.44	1.40	1.35
3	D	552	PHE	CB-CG	-5.38	1.42	1.51

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	D	248	PHE	CG-CD2	-5.36	1.30	1.38
3	D	149	PHE	CB-CG	-5.35	1.42	1.51
2	B	-10	DA	N3-C4	-5.34	1.31	1.34
3	D	241	VAL	CB-CG1	-5.30	1.41	1.52
3	D	173	TRP	NE1-CE2	-5.30	1.30	1.37
3	D	540	HIS	CB-CG	-5.30	1.40	1.50
1	A	35	DG	C6-N1	5.28	1.43	1.39
3	D	464	PHE	CG-CD1	-5.28	1.30	1.38
3	C	173	TRP	CD2-CE3	-5.28	1.32	1.40
3	C	228	TYR	CD1-CE1	-5.27	1.31	1.39
3	C	185	ARG	CG-CD	-5.27	1.38	1.51
3	D	378	HIS	CB-CG	-5.26	1.40	1.50
3	D	356	ARG	CG-CD	-5.25	1.38	1.51
3	D	479	GLU	CB-CG	5.23	1.62	1.52
3	D	422	TYR	CG-CD1	-5.22	1.32	1.39
3	D	405	TYR	CB-CG	-5.22	1.43	1.51
2	B	-35	DC	C5-C6	5.18	1.38	1.34
3	D	451	TYR	CB-CG	-5.18	1.43	1.51
3	D	299	TYR	CG-CD1	-5.17	1.32	1.39
3	C	173	TRP	CG-CD1	-5.16	1.29	1.36
3	C	448	TYR	CG-CD1	-5.15	1.32	1.39
3	D	448	TYR	CD2-CE2	-5.14	1.31	1.39
3	C	112	GLU	CD-OE2	-5.12	1.20	1.25
3	C	447	SER	CB-OG	-5.11	1.35	1.42
3	D	238	GLU	CD-OE1	-5.09	1.20	1.25
3	C	243	TRP	CG-CD1	-5.08	1.29	1.36
3	D	145	GLU	CD-OE2	-5.08	1.20	1.25
3	C	112	GLU	CD-OE1	-5.05	1.20	1.25
3	C	461	PHE	CG-CD2	-5.03	1.31	1.38
3	C	326	PHE	CB-CG	-5.01	1.42	1.51
2	B	-35	DC	C4-C5	5.01	1.47	1.43
3	D	238	GLU	CG-CD	-5.01	1.44	1.51

All (92) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	-2	DT	O4'-C1'-N1	10.32	115.22	108.00
3	D	252	TYR	CB-CG-CD2	-9.77	115.14	121.00
2	B	-31	DC	O4'-C4'-C3'	-8.77	100.74	106.00
2	B	-23	DA	N1-C6-N6	-8.69	113.39	118.60
2	B	-24	DA	N1-C6-N6	-8.13	113.72	118.60
3	C	163	ARG	NE-CZ-NH1	-8.11	116.25	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	D	455	ARG	NE-CZ-NH1	-8.08	116.26	120.30
1	A	25	DA	C5-C6-N1	8.04	121.72	117.70
2	B	-30	DC	N3-C2-O2	-7.90	116.37	121.90
1	A	25	DA	N1-C6-N6	-7.84	113.90	118.60
1	A	26	DA	C5-C6-N1	7.71	121.56	117.70
3	D	497	ARG	NE-CZ-NH1	-7.70	116.45	120.30
1	A	16	DA	C5-C6-N1	7.69	121.55	117.70
2	B	-22	DC	N3-C2-O2	-7.50	116.65	121.90
2	B	-24	DA	C5-C6-N1	7.49	121.44	117.70
1	A	26	DA	N1-C6-N6	-7.49	114.11	118.60
2	B	-23	DA	C5-C6-N1	7.36	121.38	117.70
1	A	18	DA	N1-C6-N6	-7.35	114.19	118.60
2	B	-1	DG	C5-C6-N1	7.31	115.16	111.50
1	A	17	DA	C5-C6-N1	7.19	121.30	117.70
2	B	-1	DG	N3-C4-C5	-7.04	125.08	128.60
1	A	35	DG	N3-C4-C5	-7.02	125.09	128.60
1	A	7	DG	P-O3'-C3'	6.99	128.09	119.70
3	C	209	ARG	NE-CZ-NH2	6.98	123.79	120.30
1	A	19	DC	N3-C2-O2	-6.97	117.02	121.90
1	A	35	DG	C2-N3-C4	6.94	115.37	111.90
3	D	356	ARG	NE-CZ-NH1	-6.90	116.85	120.30
3	C	533	ARG	NE-CZ-NH2	6.86	123.73	120.30
2	B	-2	DT	C1'-O4'-C4'	-6.81	103.29	110.10
1	A	18	DA	C5-C6-N1	6.79	121.10	117.70
2	B	-34	DG	O4'-C1'-N9	6.75	112.72	108.00
2	B	-24	DA	C4-C5-C6	-6.72	113.64	117.00
3	D	189	ARG	NE-CZ-NH1	-6.72	116.94	120.30
2	B	-1	DG	N1-C6-O6	-6.59	115.95	119.90
2	B	-32	DG	P-O3'-C3'	6.58	127.59	119.70
2	B	-20	DC	N3-C2-O2	-6.53	117.33	121.90
2	B	-2	DT	P-O3'-C3'	6.49	127.49	119.70
2	B	-2	DT	O4'-C1'-C2'	-6.47	100.72	105.90
3	D	248	PHE	CB-CG-CD2	-6.47	116.27	120.80
2	B	-21	DT	C6-C5-C7	-6.46	119.03	122.90
2	B	-1	DG	N3-C4-N9	6.46	129.87	126.00
2	B	-23	DA	C4-C5-C6	-6.43	113.79	117.00
1	A	16	DA	O4'-C1'-N9	6.38	112.46	108.00
1	A	17	DA	N1-C6-N6	-6.32	114.81	118.60
3	C	547	ARG	NE-CZ-NH2	6.30	123.45	120.30
2	B	-31	DC	N3-C2-O2	-6.29	117.50	121.90
2	B	-5	DA	P-O3'-C3'	6.27	127.23	119.70
1	A	16	DA	N1-C6-N6	-6.27	114.84	118.60

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	D	260	TYR	CB-CG-CD1	-6.23	117.26	121.00
2	B	-1	DG	C2-N3-C4	6.22	115.01	111.90
1	A	18	DA	C4-C5-C6	-6.20	113.90	117.00
2	B	-35	DC	P-O3'-C3'	6.19	127.12	119.70
3	D	311	TYR	CB-CG-CD2	-6.14	117.31	121.00
1	A	15	DG	N1-C6-O6	-6.09	116.25	119.90
1	A	1	DC	P-O3'-C3'	6.09	127.01	119.70
3	D	572	TYR	CB-CG-CD1	-6.09	117.35	121.00
1	A	16	DA	C4-C5-C6	-6.07	113.96	117.00
3	D	422	TYR	CB-CG-CD2	-6.07	117.36	121.00
1	A	35	DG	C5-C6-N1	6.06	114.53	111.50
1	A	35	DG	N3-C4-N9	6.04	129.63	126.00
1	A	25	DA	C4-C5-C6	-6.03	113.98	117.00
3	C	543	ARG	NE-CZ-NH2	6.03	123.31	120.30
3	D	497	ARG	NE-CZ-NH2	6.02	123.31	120.30
1	A	1	DC	O4'-C1'-N1	5.85	112.09	108.00
1	A	26	DA	P-O3'-C3'	5.80	126.66	119.70
2	B	-31	DC	C6-N1-C2	-5.75	118.00	120.30
3	D	122	TYR	CB-CG-CD2	-5.71	117.57	121.00
1	A	20	DG	N1-C6-O6	-5.71	116.48	119.90
3	C	185	ARG	NE-CZ-NH1	-5.66	117.47	120.30
2	B	-18	DT	C6-C5-C7	-5.65	119.51	122.90
2	B	-30	DC	N1-C2-O2	5.63	122.28	118.90
2	B	-31	DC	N1-C2-O2	5.61	122.27	118.90
2	B	-22	DC	O4'-C1'-N1	5.50	111.85	108.00
3	D	120	ARG	NE-CZ-NH2	5.48	123.04	120.30
2	B	-16	DT	O4'-C1'-N1	-5.48	104.17	108.00
3	C	249	PHE	CB-CG-CD1	5.47	124.63	120.80
2	B	-13	DC	N3-C2-O2	-5.38	118.13	121.90
2	B	-18	DT	N3-C2-O2	-5.38	119.07	122.30
1	A	26	DA	C4-C5-C6	-5.38	114.31	117.00
1	A	34	DC	P-O3'-C3'	5.34	126.11	119.70
3	C	508	ARG	NE-CZ-NH2	5.34	122.97	120.30
1	A	15	DG	N3-C4-C5	-5.33	125.94	128.60
3	C	532	ARG	NE-CZ-NH2	5.30	122.95	120.30
2	B	-31	DC	O4'-C1'-N1	-5.27	104.31	108.00
2	B	-13	DC	O4'-C1'-C2'	-5.19	101.75	105.90
3	D	252	TYR	CB-CG-CD1	5.16	124.10	121.00
3	C	418	TYR	CB-CG-CD2	-5.13	117.92	121.00
3	C	187	ARG	NE-CZ-NH2	5.07	122.84	120.30
2	B	-7	DC	O4'-C1'-N1	-5.05	104.46	108.00
3	C	209	ARG	NE-CZ-NH1	-5.03	117.78	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	-13	DC	C6-N1-C2	-5.03	118.29	120.30
1	A	17	DA	C4-C5-C6	-5.02	114.49	117.00

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	17	DA	Sidechain
1	A	18	DA	Sidechain

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	725	0	394	0	0
2	B	710	0	394	0	0
3	C	3883	0	3904	14	0
3	D	4185	0	4193	12	0
4	C	2	0	0	0	0
4	D	2	0	0	0	0
All	All	9507	0	8885	26	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 1.

All (26) 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:423:SER:OG	3:C:424:ILE:N	2.32	0.63
3:C:367:SER:OG	3:C:368:LYS:N	2.32	0.63
3:C:428:THR:OG1	3:C:429:VAL:N	2.31	0.59
3:D:132:SER:OG	3:D:133:LYS:N	2.41	0.54
3:C:372:TYR:CD2	3:C:372:TYR:C	2.82	0.50
3:D:239:GLY:O	3:D:240:ILE:HB	2.11	0.50
3:D:169:THR:OG1	3:D:170:THR:N	2.45	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:D:547:ARG:O	3:D:547:ARG:HG3	2.13	0.47
3:D:335:ASN:OD1	3:D:335:ASN:N	2.48	0.46
3:D:109:ASP:OD1	3:D:109:ASP:N	2.49	0.45
3:D:309:ASP:OD1	3:D:309:ASP:N	2.44	0.45
3:D:394:LYS:O	3:D:395:LYS:HB2	2.15	0.45
3:C:419:LEU:HD22	3:C:441:ASN:HB3	1.97	0.45
3:C:365:TRP:CG	3:C:366:GLN:N	2.85	0.45
3:C:199:ASN:OD1	3:C:199:ASN:N	2.45	0.45
3:C:196:HIS:NE2	3:C:198:ASN:O	2.47	0.45
3:C:422:TYR:CG	3:C:423:SER:N	2.86	0.43
3:C:91:THR:OG1	3:C:92:ASP:N	2.52	0.43
3:C:400:ASN:N	3:C:400:ASN:OD1	2.50	0.42
3:C:475:ASP:OD1	3:C:475:ASP:N	2.45	0.42
3:C:258:VAL:O	3:C:258:VAL:HG13	2.19	0.41
3:C:342:PHE:CD2	3:C:342:PHE:C	2.94	0.41
3:D:202:ASP:N	3:D:202:ASP:OD1	2.42	0.41
3:D:241:VAL:HG23	3:D:241:VAL:O	2.20	0.41
3:D:257:ILE:O	3:D:258:VAL:C	2.54	0.41
3:D:277:ASN:OD1	3:D:278:MET:N	2.54	0.41

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	
3	C	458/578 (79%)	449 (98%)	9 (2%)	0	100	100
3	D	498/578 (86%)	485 (97%)	12 (2%)	1 (0%)	44	73
All	All	956/1156 (83%)	934 (98%)	21 (2%)	1 (0%)	50	79

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
3	D	240	ILE

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
3	C	429/529 (81%)	427 (100%)	2 (0%)	86 93
3	D	464/529 (88%)	464 (100%)	0	100 100
All	All	893/1058 (84%)	891 (100%)	2 (0%)	91 96

All (2) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	C	160	ARG
3	C	538	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

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 oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 4 ligands modelled in this entry, 4 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

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.

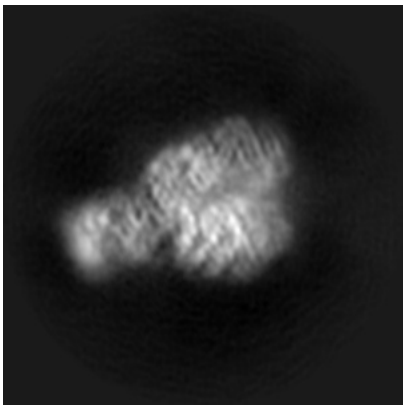
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-45082. These allow visual inspection of the internal detail of the map and identification of artifacts.

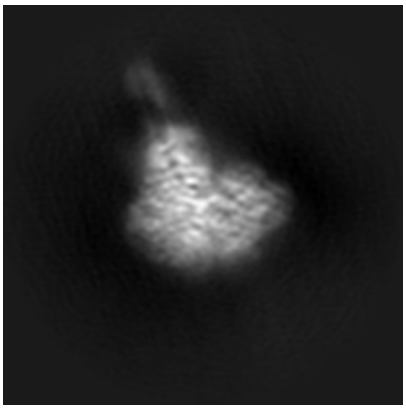
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

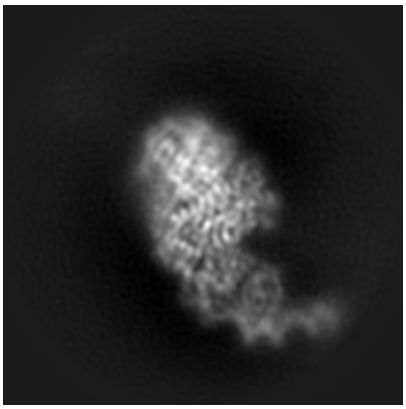
6.1.1 Primary map



X

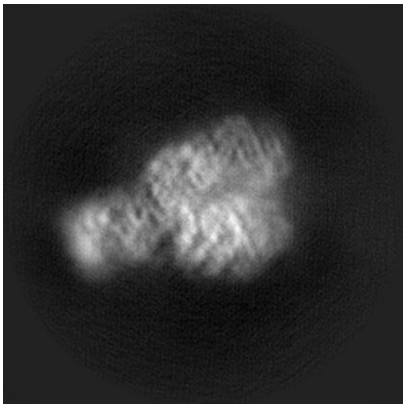


Y

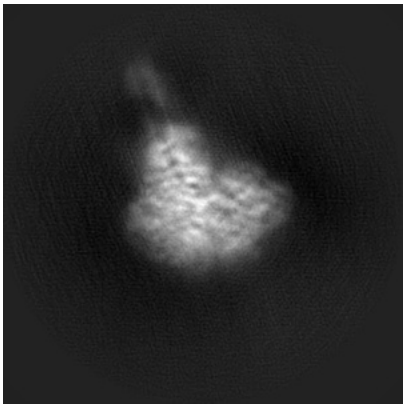


Z

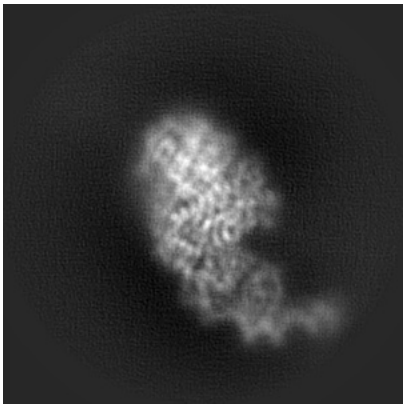
6.1.2 Raw map



X



Y

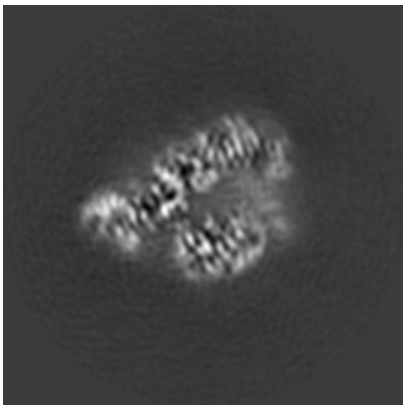


Z

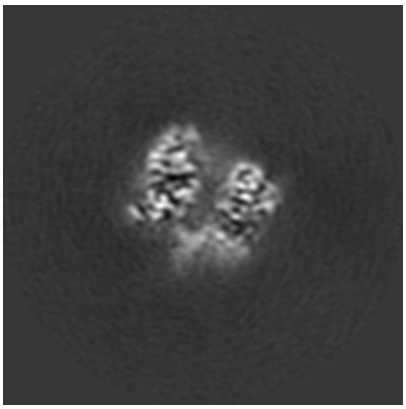
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

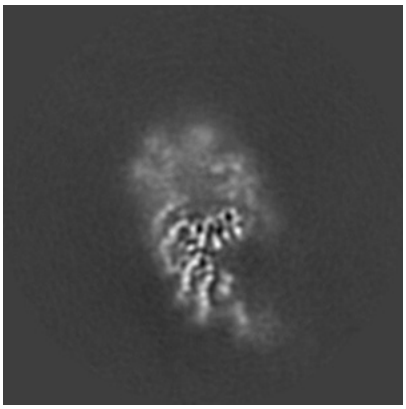
6.2.1 Primary map



X Index: 120

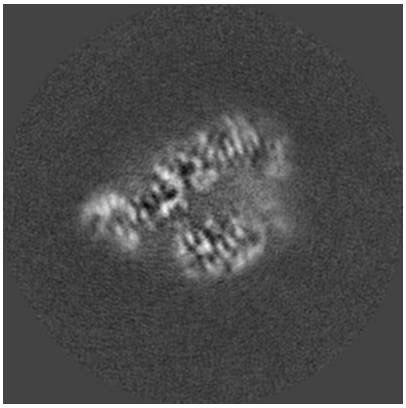


Y Index: 120

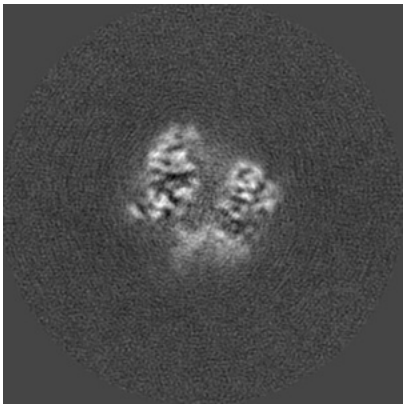


Z Index: 120

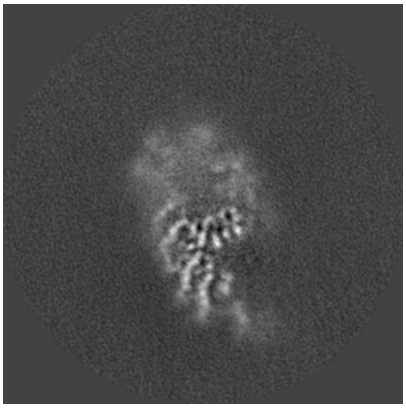
6.2.2 Raw map



X Index: 120



Y Index: 120

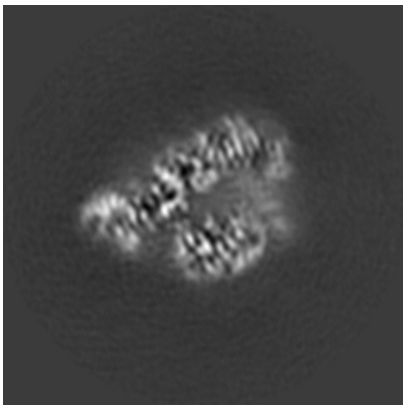


Z Index: 120

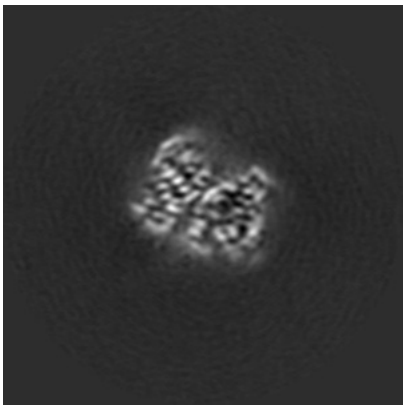
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

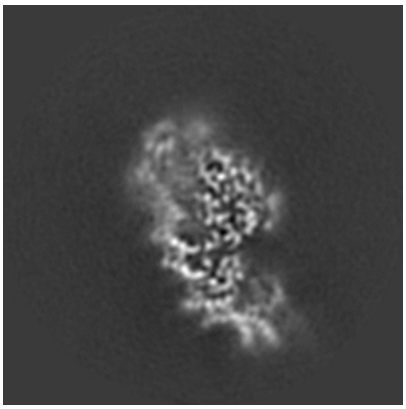
6.3.1 Primary map



X Index: 120

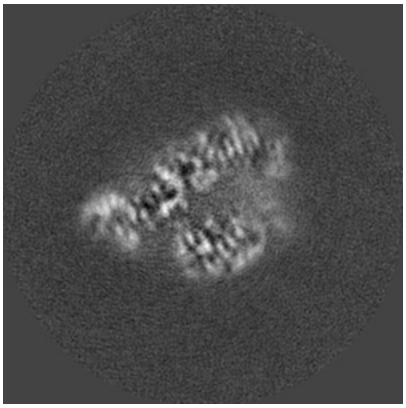


Y Index: 110

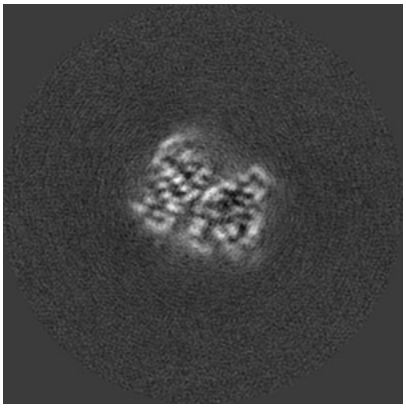


Z Index: 110

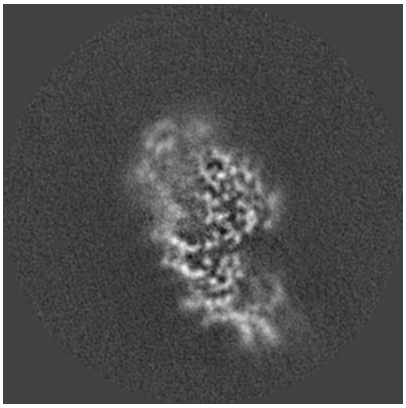
6.3.2 Raw map



X Index: 120



Y Index: 110

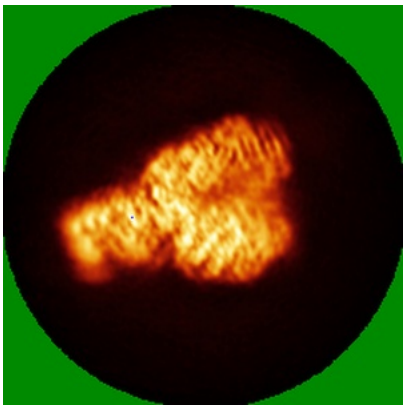


Z Index: 110

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

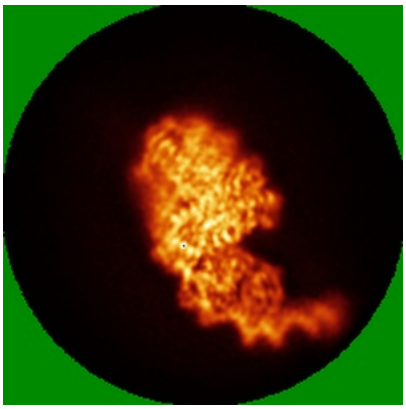
6.4 Orthogonal standard-deviation projections (False-color) (i)

6.4.1 Primary map



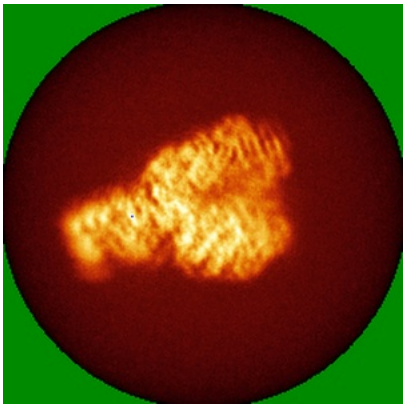
X

Y

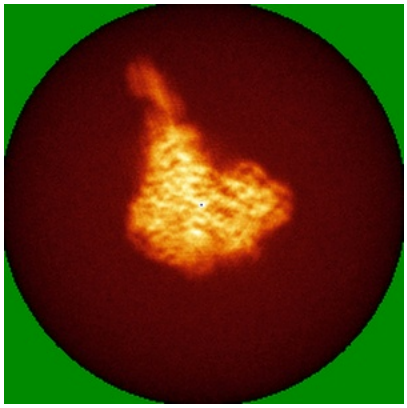


Z

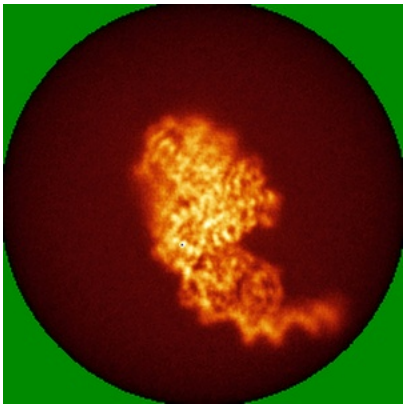
6.4.2 Raw map



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 0.004. 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.

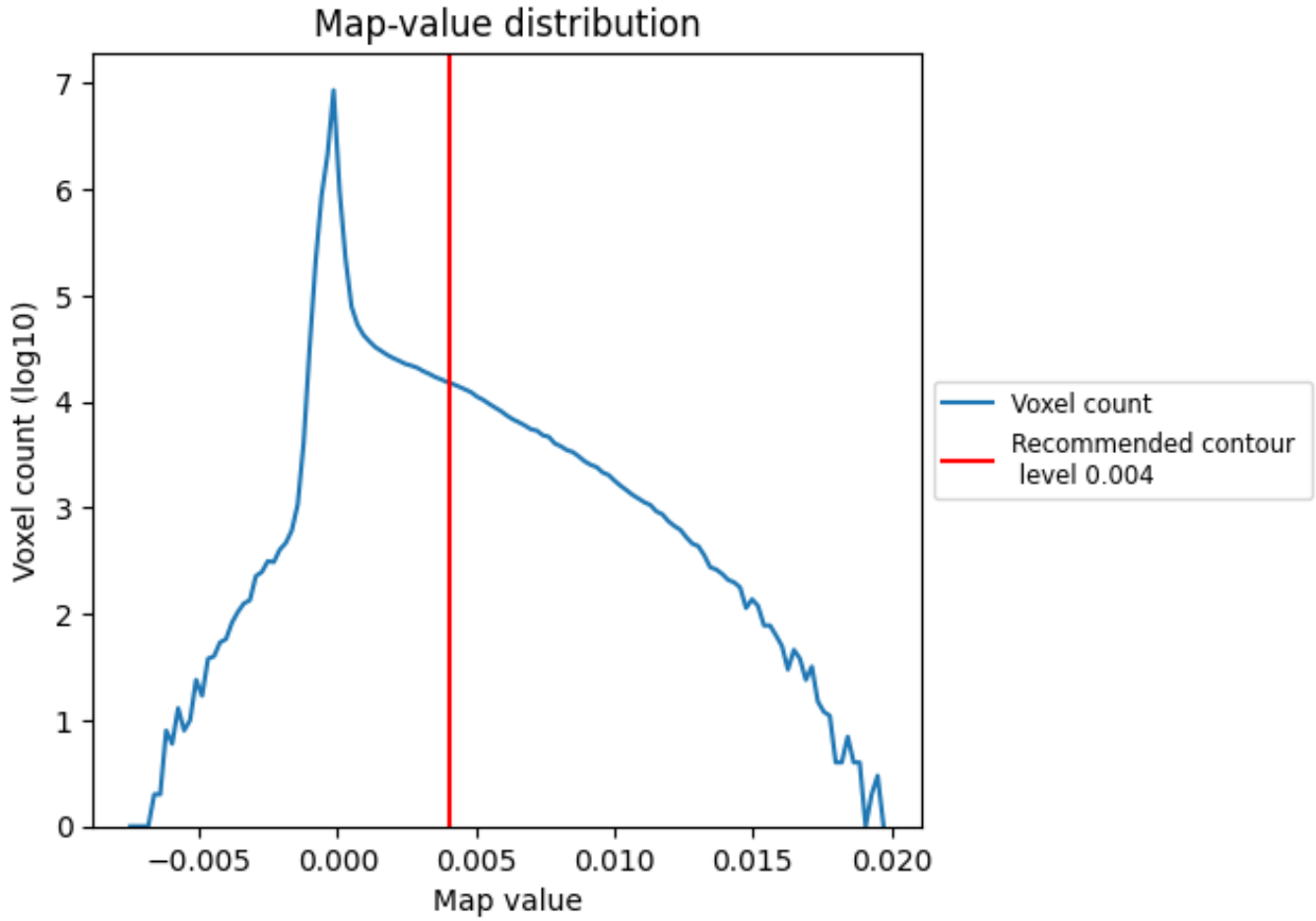
6.6 Mask visualisation (i)

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

7 Map analysis

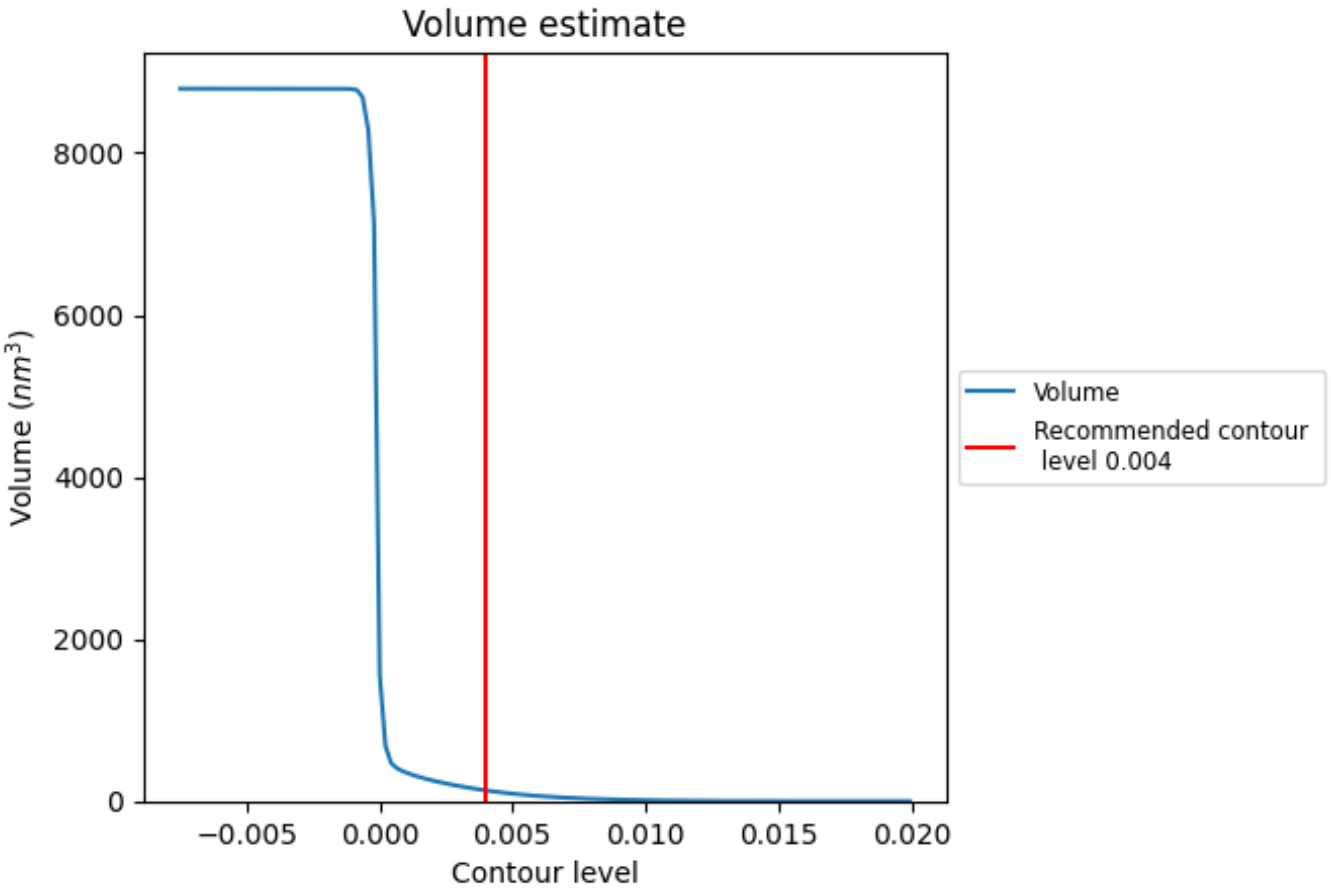
This section contains the results of statistical analysis of the map.

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.

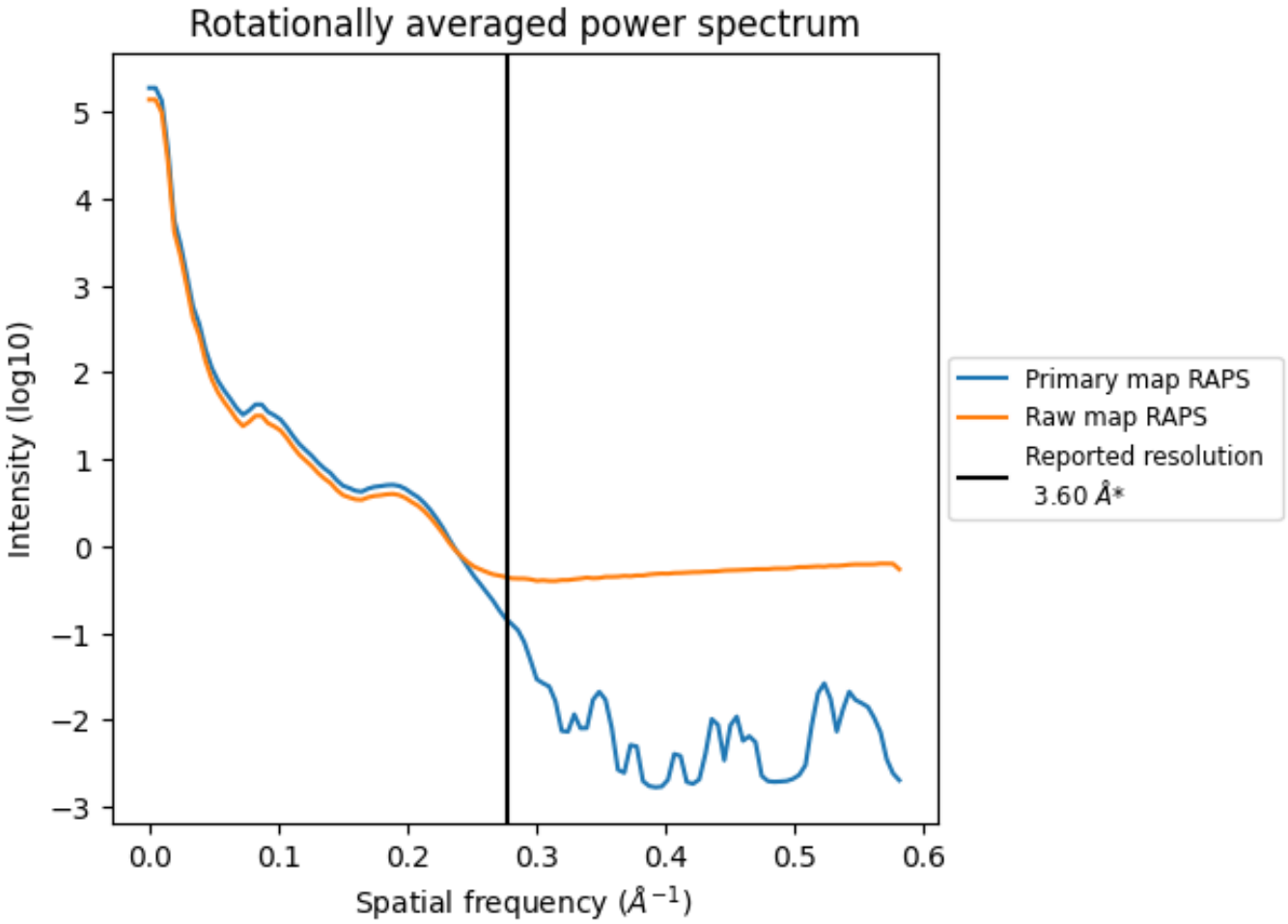
7.2 Volume estimate (i)



The volume at the recommended contour level is 133 nm^3; this corresponds to an approximate mass of 120 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)

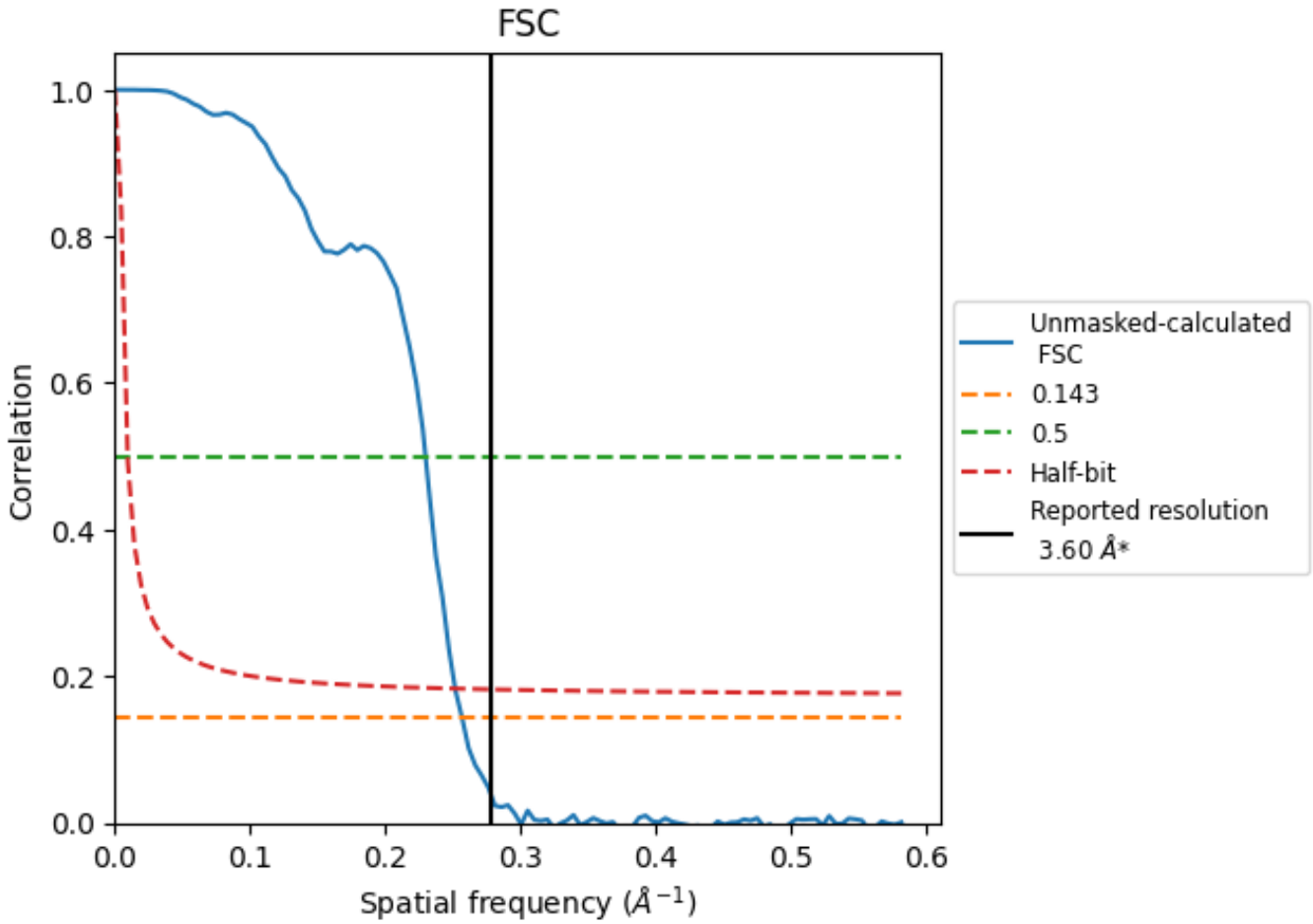


*Reported resolution corresponds to spatial frequency of 0.278 Å^{-1}

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 0.278 Å^{-1}

8.2 Resolution estimates (i)

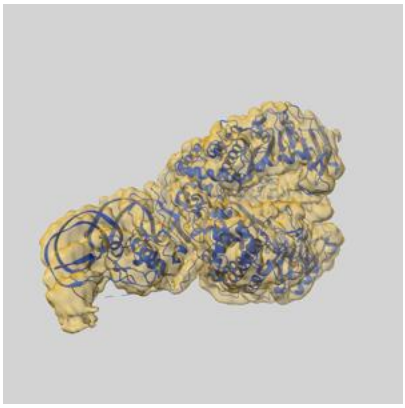
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.60	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	3.90	4.35	3.97

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

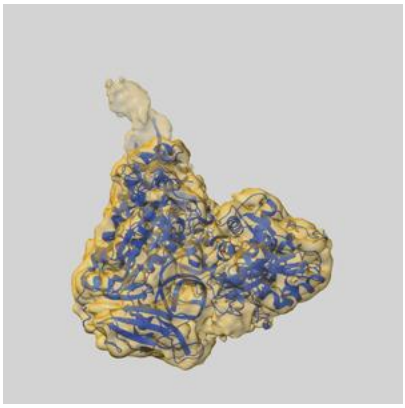
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-45082 and PDB model 9C0F. Per-residue inclusion information can be found in section 3 on page 4.

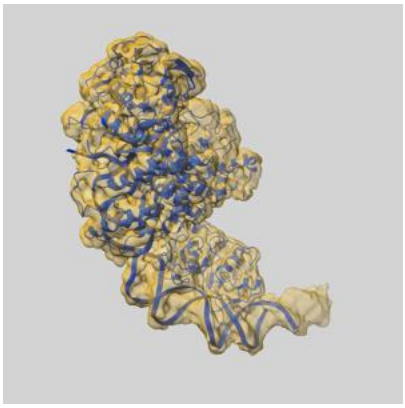
9.1 Map-model overlay



X



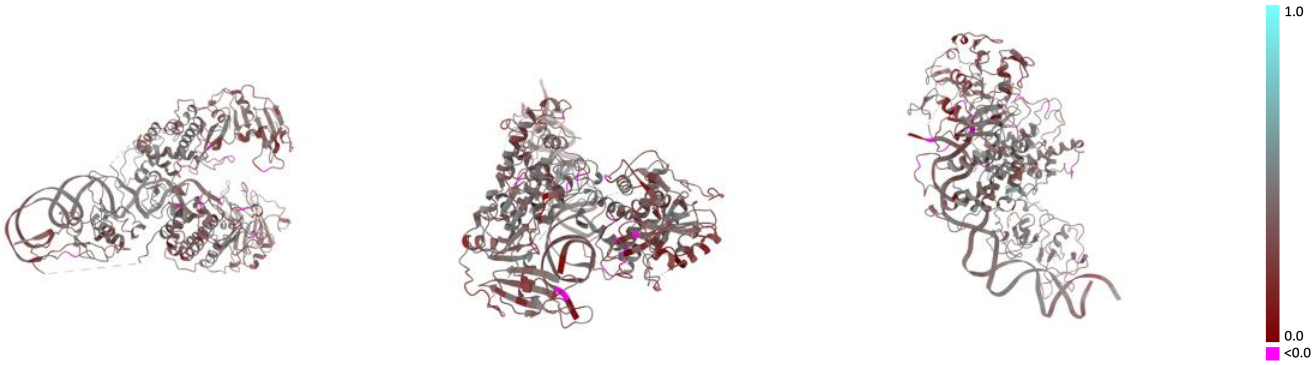
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.004 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.

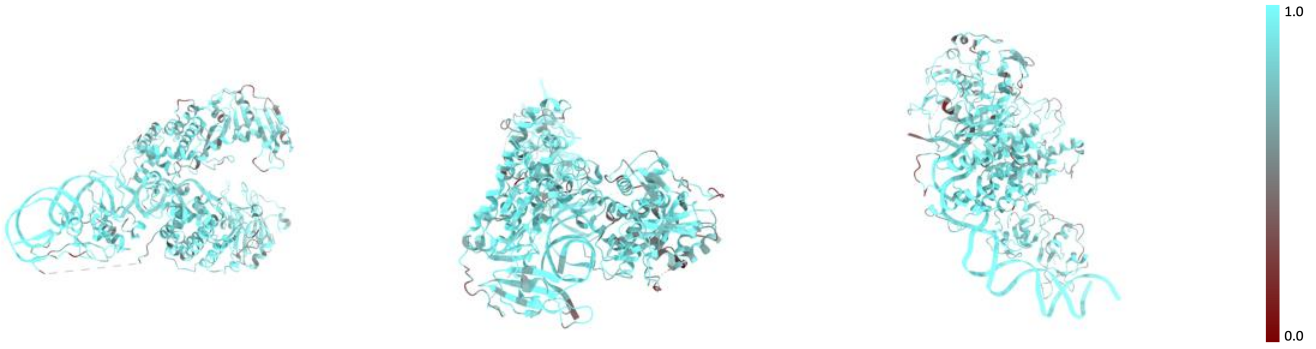
9.2 Q-score mapped to coordinate model (i)



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.

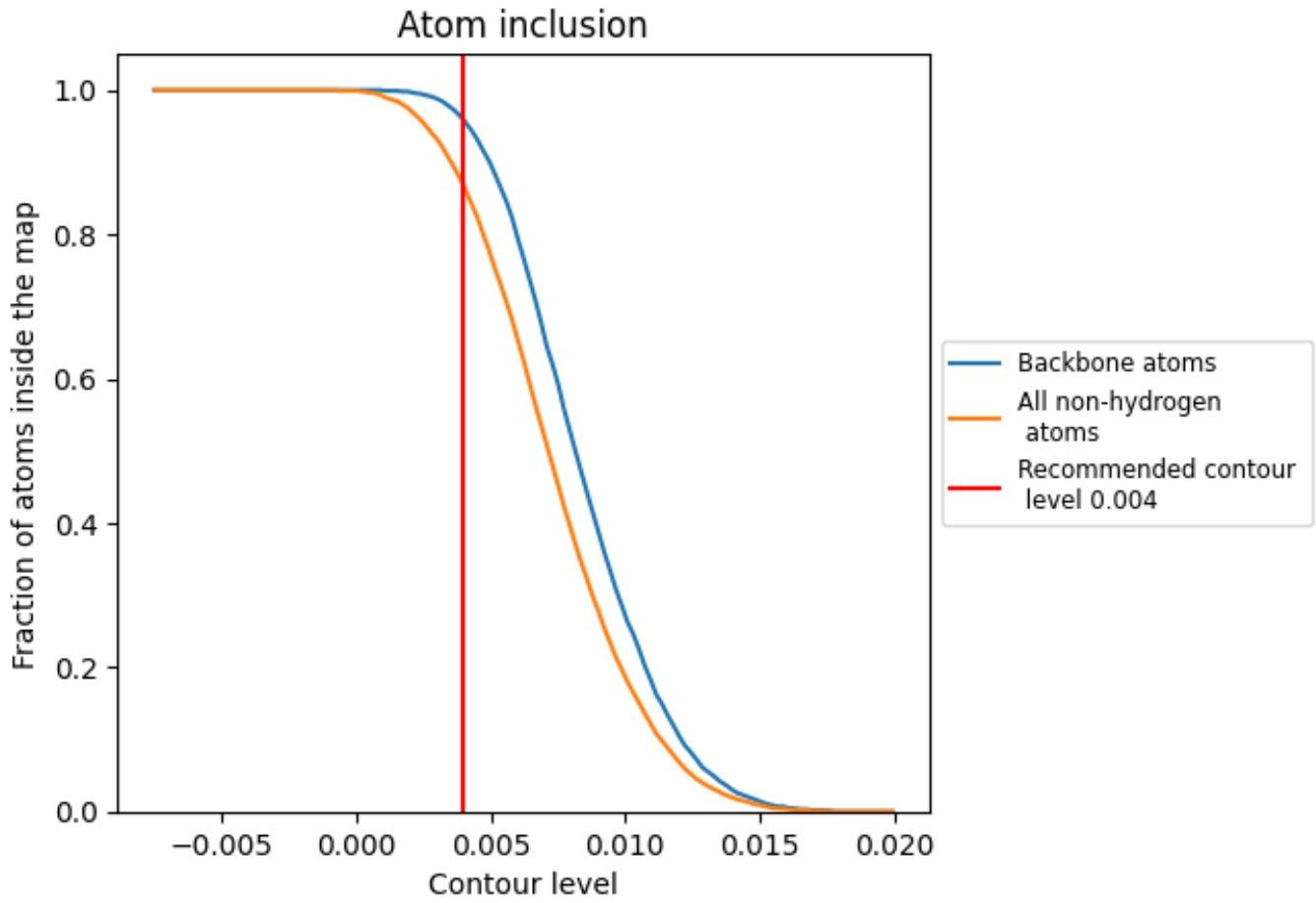
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.004).

9.4 Atom inclusion (i)



At the recommended contour level, 96% of all backbone atoms, 87% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary (i)

The table lists the average atom inclusion at the recommended contour level (0.004) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8680	0.3640
A	0.9600	0.3650
B	0.9760	0.3740
C	0.8370	0.3610
D	0.8610	0.3640