



Full wwPDB EM Validation Report ⓘ

Sep 7, 2026 – 06:19 PM JST

PDB ID : 9XBY / pdb_00009xby
EMDB ID : EMD-66714
Title : BAM-SurA complex (P1-visible)
Authors : Kohga, H.; Miyazaki, R.; Tsukazaki, T.
Deposited on : 2025-10-24
Resolution : 3.90 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:

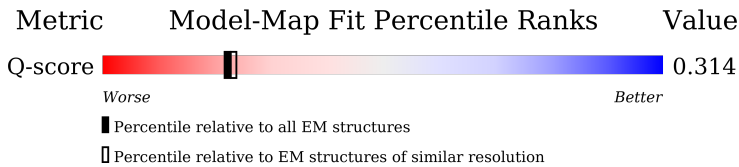
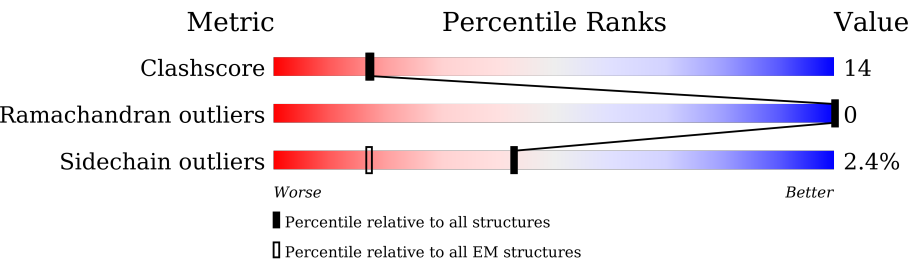
EMDB validation analysis : 0.0.1.dev133
MolProbity : 4-5-2 with Phenix2.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.50

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 3.90 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)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
Q-score	-	25397	8855 (3.40 - 4.40)

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 $\leq 5\%$. 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	1222	48% 15% 36%
1	F	1222	14% 7% 78%
2	B	392	61% 32% 7%
3	C	344	34% 22% 45%

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
4	D	245	 67% 22% 11%
5	E	123	 57% 16% 27%

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 14953 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 Chaperone SurA, Outer membrane protein assembly factor BamA.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	782	Total	C	N	O	S	0	0
			6179	3895	1042	1226	16		
1	F	271	Total	C	N	O	S	0	0
			2119	1309	392	406	12		

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	17	GLY	-	linker	UNP P0ABZ8
A	18	GLY	-	linker	UNP P0ABZ8
A	19	SER	-	linker	UNP P0ABZ8
F	429	GLY	-	linker	UNP P0ABZ8
F	430	GLY	-	linker	UNP P0ABZ8
F	431	SER	-	linker	UNP P0ABZ8

- Molecule 2 is a protein called Outer membrane protein assembly factor BamB.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	366	Total	C	N	O	S	0	0
			2752	1727	472	547	6		

- Molecule 3 is a protein called Outer membrane protein assembly factor BamC.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	C	190	Total	C	N	O	S	0	0
			1440	893	254	288	5		

- Molecule 4 is a protein called Outer membrane protein assembly factor BamD.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	D	218	Total	C	N	O	S	0	0
			1761	1109	309	336	7		

- Molecule 5 is a protein called Outer membrane protein assembly factor BamE.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	E	90	Total	C	N	O	S	0	0
			702	441	123	136	2		

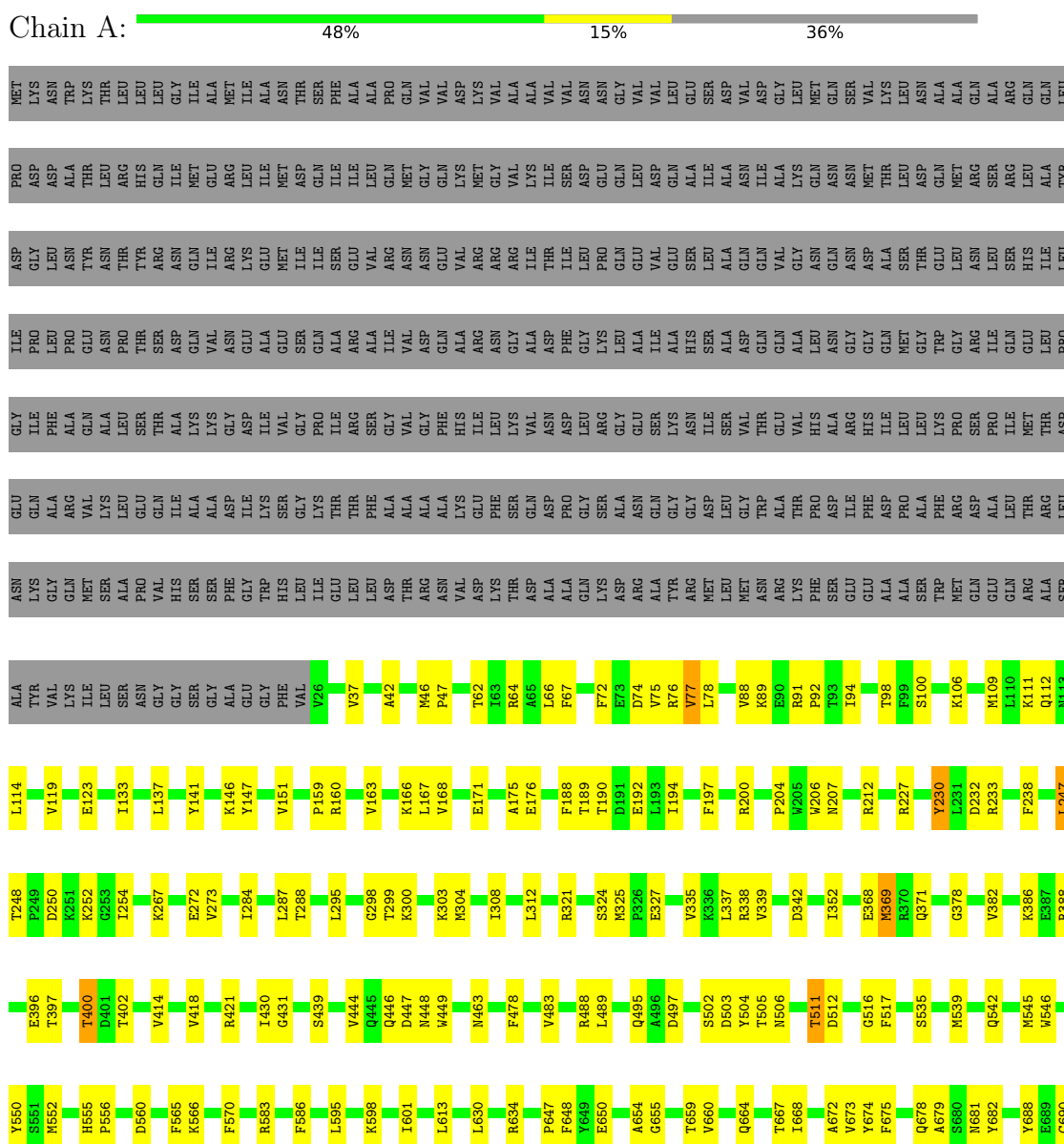
There are 10 discrepancies between the modelled and reference sequences:

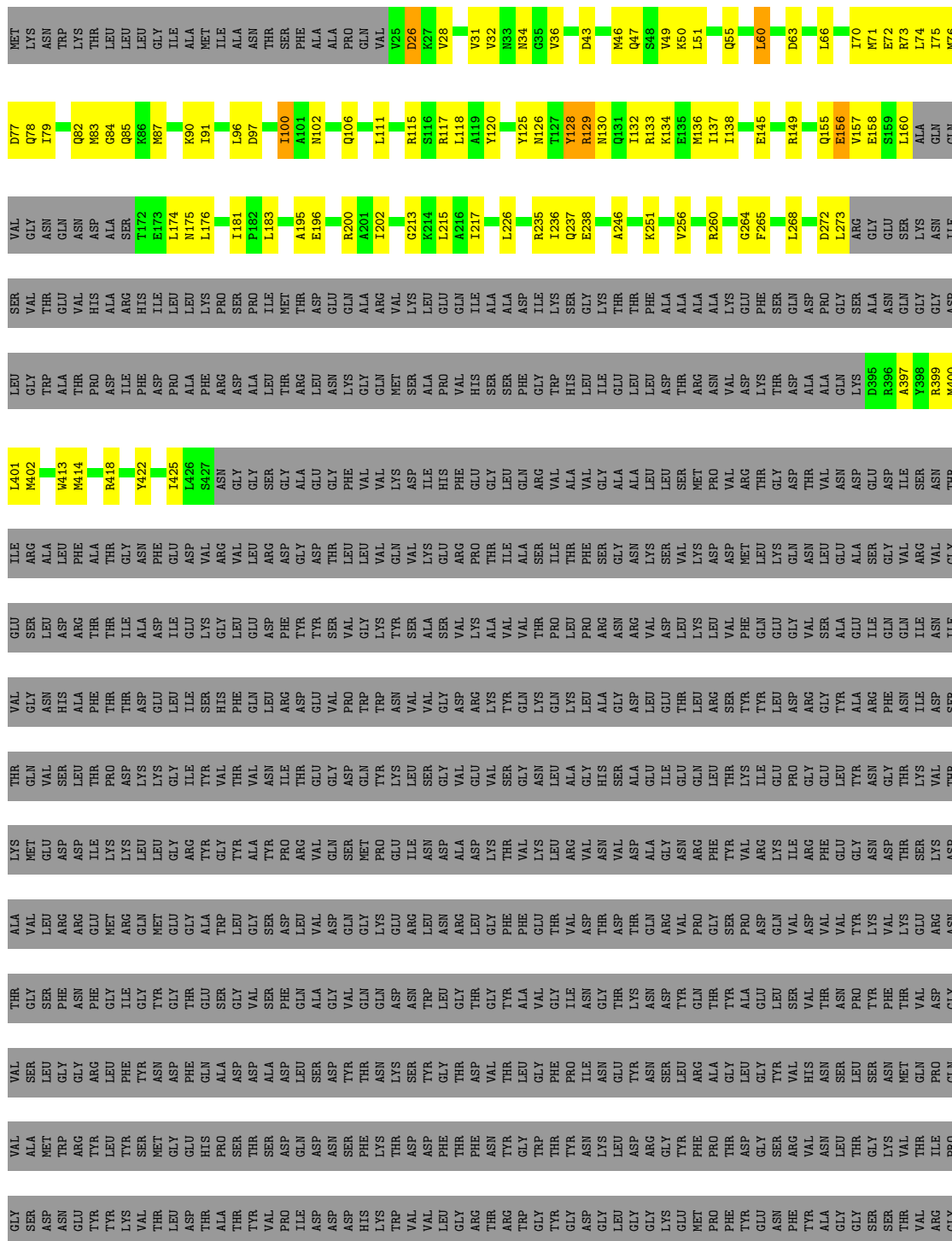
Chain	Residue	Modelled	Actual	Comment	Reference
E	114	GLY	-	expression tag	UNP P0A938
E	115	GLY	-	expression tag	UNP P0A938
E	116	HIS	-	expression tag	UNP P0A938
E	117	HIS	-	expression tag	UNP P0A938
E	118	HIS	-	expression tag	UNP P0A938
E	119	HIS	-	expression tag	UNP P0A938
E	120	HIS	-	expression tag	UNP P0A938
E	121	HIS	-	expression tag	UNP P0A938
E	122	HIS	-	expression tag	UNP P0A938
E	123	HIS	-	expression tag	UNP P0A938

3 Residue-property plots

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

- Molecule 1: Chaperone SurA, Outer membrane protein assembly factor BamA





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

• Molecule 2: Outer membrane protein assembly factor BamB

Chain B:  61% 32% 7%

MET	GLN	LEU	ARG	LYS	LEU	LEU	LEU	PRO	GLY	VAL	THR	LEU	LEU	SER	GLY	CYS	SER	SER	PHE	LEU	ASN	SER	GLU	E27	D28	V29	V90	K31	T45	T46	S51	V52	G55	Y60	S61	N62	L63	L67	R77	A78	G79	K82	A83	L84	N85	A86	D87	K90	E91
I92	W93	S94	V95	S96	L97	G102	W103	F104	S105	K106	E107	L110	L111	S112	S118	S126	E127	K128	V131	L134	V141	A142	E150	V157	V162	T166	S167	N168	L171	E176	L187	D188	M189	P190	S193	L194	R195	G196	E197	N198	S199	P200	T201						
A207	V208	V209	D212	N213	G214	R215	V219	L220	M221	M226	R231	R243	D246	V247	D248	T249	E250	P251	V252	V254	L261	L267	D271	G275	M278	W279	K280	R281	E282	L283	D288	F289	I290	V291	D292	I296	Y297	V305	M306	A307	L308	T309	I310	D311					
G312	T315	L316	W317	T318	Q319	L326	L332	L337	D341	S342	Y345	L346	H347	W348	V351	E352	D353	G354	R355	F356	V357	Q360	K361	V362	S365	F367	Q368	A373	A374	D375	G376	K377	L378	A382	K383	D384	G385	T386	V387	Y388	S389	I390	T391	R392					

• Molecule 3: Outer membrane protein assembly factor BamC

Chain C:  34% 22% 45%

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

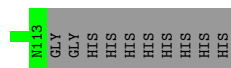
• Molecule 4: Outer membrane protein assembly factor BamD

Chain D:  67% 22% 11%

MET	THR	ARG	MET	LYS	TYR	LEU	VAL	ALA	ALA	ALA	THR	THR	LEU	SER	GLY	HIS	THR	LEU	THR	THR	GLN	SER	GLN	ASN	ASP	ALA	LYS	GLU	E26	V27	P31	P32	N33	E34	I35	T38	K42	W48	I52	T53	Q54	L55	E56	R61	Y67	V71	Y79	Y80	K81	A88	Q89	I92
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----



- Chain E: 57% 16% 27%



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	19464	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	JEOL CRYO ARM 300	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	50.00	Depositor
Minimum defocus (nm)	1400	Depositor
Maximum defocus (nm)	1600	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.618	Depositor
Minimum map value	-0.223	Depositor
Average map value	0.002	Depositor
Map value standard deviation	0.029	Depositor
Recommended contour level	0.05	Depositor
Map size ($\text{\AA}$)	240.63998, 240.63998, 240.63998	wwPDB
Map dimensions	320, 320, 320	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing ($\text{\AA}$)	0.752, 0.752, 0.752	Depositor

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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	0.20	0/6321	0.35	0/8575
1	F	0.48	0/2140	0.70	1/2881 (0.0%)
2	B	0.17	0/2802	0.39	0/3822
3	C	0.17	0/1465	0.46	0/1995
4	D	0.21	0/1801	0.37	0/2447
5	E	0.22	0/717	0.40	0/977
All	All	0.25	0/15246	0.44	1/20697 (0.0%)

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	F	0	1

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed($^{\circ}$)	Ideal($^{\circ}$)
1	F	34	ASN	N-CA-C	-6.64	105.47	113.97

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	F	129	ARG	Sidechain

5.2 Too-close contacts ⓘ

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	6179	0	5892	131	0
1	F	2119	0	2139	88	0
2	B	2752	0	2701	84	0
3	C	1440	0	1418	64	0
4	D	1761	0	1699	38	0
5	E	702	0	680	15	0
All	All	14953	0	14529	406	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 14.

All (406) 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:F:156:GLU:O	1:F:160:LEU:HD22	1.28	1.32
1:F:156:GLU:O	1:F:160:LEU:CD2	1.99	1.09
1:F:85:GLN:C	1:F:90:LYS:HZ3	1.68	1.01
1:F:85:GLN:HA	1:F:90:LYS:NZ	1.79	0.98
1:A:630:LEU:HB3	1:A:717:GLU:HB2	1.49	0.94
1:F:85:GLN:HA	1:F:90:LYS:CE	2.00	0.91
1:F:157:VAL:HG22	1:F:401:LEU:HD21	1.52	0.89
1:F:85:GLN:O	1:F:90:LYS:NZ	2.05	0.88
1:F:85:GLN:C	1:F:90:LYS:NZ	2.32	0.88
5:E:42:ASP:HA	5:E:45:LYS:HZ1	1.40	0.87
1:F:85:GLN:CA	1:F:90:LYS:NZ	2.38	0.85
1:F:91:ILE:HG13	1:F:136:MET:HG3	1.58	0.85
1:F:72:GLU:HA	1:F:75:ILE:HD12	1.61	0.82
1:F:117:ARG:NH1	1:F:120:TYR:CE2	2.48	0.82
2:B:51:SER:HA	2:B:386:THR:HB	1.62	0.82
2:B:278:MET:HG3	1:F:156:GLU:OE2	1.79	0.81
1:F:85:GLN:HA	1:F:90:LYS:HZ1	1.43	0.80
1:A:232:ASP:HA	1:A:298:GLY:H	1.47	0.79
1:A:106:LYS:HB2	1:A:109:MET:HE1	1.65	0.79
2:B:271:ASP:HB3	2:B:275:GLY:HA3	1.66	0.77
4:D:198:VAL:HG13	4:D:218:MET:HE2	1.67	0.76

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:396:GLU:HG3	1:A:397:THR:HG23	1.69	0.75
1:F:85:GLN:CA	1:F:90:LYS:HZ1	1.95	0.75
3:C:121:VAL:HG21	3:C:134:ARG:HH21	1.53	0.74
2:B:104:PHE:HB3	2:B:107:GLU:HG3	1.71	0.73
1:F:175:ASN:HB2	1:F:272:ASP:HB3	1.69	0.73
2:B:194:LEU:HD12	2:B:195:ARG:H	1.54	0.72
1:F:117:ARG:NH1	1:F:120:TYR:CD2	2.57	0.72
1:A:146:LYS:HD2	1:A:171:GLU:HB2	1.71	0.71
5:E:43:VAL:HG12	5:E:91:LEU:HD11	1.71	0.71
1:A:352:ILE:HG22	1:A:414:VAL:HB	1.73	0.71
5:E:52:GLN:HE21	5:E:99:GLY:HA2	1.57	0.70
1:F:85:GLN:HA	1:F:90:LYS:HE3	1.73	0.70
3:C:53:PRO:HG2	3:C:56:MET:HB3	1.73	0.69
3:C:83:ARG:HE	3:C:84:PRO:HD2	1.57	0.69
1:F:76:MET:HE2	1:F:418:ARG:HH21	1.56	0.69
1:A:98:THR:HB	1:A:166:LYS:HA	1.73	0.69
1:F:32:VAL:HG21	1:F:79:ILE:HG22	1.73	0.69
1:A:141:TYR:HE2	1:A:171:GLU:HB3	1.58	0.68
2:B:31:LYS:HD3	2:B:31:LYS:N	2.08	0.68
1:A:659:THR:HG22	1:A:660:VAL:HG23	1.75	0.68
1:A:542:GLN:HG2	1:A:672:ALA:HB1	1.76	0.67
3:C:61:THR:HG22	3:C:63:GLY:H	1.59	0.66
2:B:134:LEU:HA	2:B:142:ALA:H	1.61	0.65
2:B:199:ALA:HB3	2:B:250:THR:HB	1.79	0.65
1:A:194:ILE:HG22	1:A:200:ARG:HH21	1.63	0.64
2:B:219:VAL:HG22	2:B:226:MET:HA	1.78	0.64
1:A:133:ILE:O	1:A:137:LEU:HD22	1.97	0.64
1:A:489:LEU:HG	1:A:511:THR:HB	1.79	0.64
1:F:75:ILE:HB	1:F:418:ARG:HH22	1.62	0.64
3:C:112:ARG:HD3	3:C:116:LEU:HD13	1.77	0.63
4:D:117:MET:HE1	4:D:166:ARG:HD3	1.80	0.63
4:D:88:ALA:O	4:D:92:ILE:HG22	1.98	0.63
2:B:162:VAL:HG23	2:B:176:GLU:HG2	1.79	0.63
2:B:85:ASN:HB3	2:B:90:LYS:HB3	1.80	0.63
1:A:749:TRP:HB3	1:A:761:SER:HB3	1.81	0.62
2:B:77:ARG:HD2	2:B:110:LEU:HA	1.81	0.62
1:F:111:LEU:O	1:F:115:ARG:HG3	2.00	0.62
3:C:112:ARG:HH21	3:C:213:ALA:HB2	1.66	0.61
1:A:273:VAL:HG12	1:A:339:VAL:HB	1.82	0.60
1:A:299:THR:O	1:A:303:LYS:HG2	2.01	0.60
1:A:733:VAL:HG12	1:A:776:TRP:HB2	1.83	0.60

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:E:47:ARG:H	5:E:50:MET:HE1	1.66	0.60
1:A:204:PRO:HG2	1:A:207:ASN:HB3	1.82	0.60
5:E:75:TYR:HB2	5:E:91:LEU:HB2	1.83	0.60
3:C:96:ARG:HB3	3:C:107:LEU:HD12	1.82	0.60
1:A:738:PHE:HZ	1:A:788:ALA:HB2	1.66	0.60
2:B:200:PRO:HB3	2:B:209:VAL:HB	1.82	0.60
1:A:775:GLN:HG2	1:A:784:VAL:HG22	1.84	0.59
3:C:106:LEU:HD12	3:C:108:VAL:HG23	1.84	0.59
2:B:118:SER:HB2	2:B:157:VAL:HG21	1.84	0.59
1:A:321:ARG:HB2	1:A:342:ASP:HB3	1.83	0.58
2:B:249:THR:HG23	2:B:288:ASP:HA	1.84	0.58
3:C:97:THR:HB	3:C:202:MET:HE1	1.84	0.58
1:A:273:VAL:HG11	1:A:288:THR:HG21	1.85	0.58
2:B:215:ARG:HG2	2:B:231:ARG:HA	1.85	0.58
1:A:190:THR:O	1:A:194:ILE:HG12	2.03	0.58
1:A:67:PHE:CE2	1:F:36:VAL:HG11	2.38	0.57
2:B:267:LEU:HB2	2:B:281:ARG:HB2	1.85	0.57
2:B:134:LEU:HG	2:B:141:VAL:HA	1.87	0.57
4:D:48:TRP:O	4:D:52:ILE:HG12	2.04	0.57
2:B:281:ARG:HB3	2:B:283:LEU:HD23	1.88	0.56
2:B:194:LEU:HB3	2:B:246:ASP:OD2	2.05	0.56
2:B:290:ILE:HD12	2:B:332:LEU:HG	1.88	0.56
1:A:46:MET:HB2	1:A:62:THR:HB	1.87	0.56
1:F:181:ILE:HD12	1:F:195:ALA:HB1	1.88	0.55
3:C:117:TRP:CH2	3:C:141:LEU:HB3	2.42	0.55
1:A:197:PHE:HB2	1:A:200:ARG:HH22	1.69	0.55
2:B:171:LEU:HD23	2:B:187:LEU:HD23	1.89	0.55
1:A:75:VAL:HG22	1:A:88:VAL:HA	1.88	0.54
1:A:227:ARG:HA	1:A:238:PHE:HE2	1.72	0.54
1:F:174:LEU:HB3	1:F:176:LEU:HD13	1.88	0.54
3:C:127:LYS:HB3	3:C:129:TYR:CZ	2.43	0.54
1:A:248:THR:HG23	1:A:250:ASP:H	1.72	0.54
5:E:35:GLY:HA3	5:E:77:PHE:HA	1.88	0.54
1:A:325:MET:N	1:A:325:MET:HE2	2.22	0.54
2:B:212:ASP:HA	2:B:246:ASP:HB2	1.88	0.54
3:C:197:TYR:HA	3:C:200:GLU:OE1	2.07	0.54
2:B:190:PRO:HG2	2:B:193:SER:HB2	1.89	0.54
1:F:46:MET:HG3	1:F:70:ILE:HG21	1.88	0.54
1:A:76:ARG:HH21	1:A:78:LEU:HD11	1.72	0.53
2:B:157:VAL:HG12	2:B:162:VAL:HG22	1.90	0.53
1:A:47:PRO:HD2	1:A:62:THR:HG22	1.91	0.53

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:123:VAL:HG21	3:C:209:LEU:HD22	1.88	0.53
4:D:117:MET:CE	4:D:166:ARG:HD3	2.39	0.53
2:B:63:LEU:HD21	2:B:112:SER:HA	1.90	0.52
1:F:134:LYS:O	1:F:138:ILE:HG12	2.09	0.52
1:F:132:ILE:HG22	1:F:136:MET:CE	2.40	0.52
3:C:53:PRO:HB2	4:D:236:LYS:HE2	1.91	0.52
4:D:67:TYR:O	4:D:71:VAL:HG23	2.08	0.52
1:F:73:ARG:HA	1:F:76:MET:HE3	1.91	0.52
1:A:200:ARG:CZ	1:A:200:ARG:HA	2.40	0.52
3:C:191:ALA:O	3:C:195:GLN:HG3	2.10	0.52
1:A:37:VAL:HG21	1:A:72:PHE:HE1	1.74	0.52
1:A:247:LEU:HD13	1:A:254:ILE:HG13	1.91	0.52
1:A:664:GLN:HB2	1:A:667:THR:HG21	1.91	0.52
4:D:27:VAL:HG23	4:D:61:ARG:HH22	1.74	0.52
1:A:446:GLN:HG2	1:A:449:TRP:HE3	1.75	0.51
1:A:300:LYS:HD3	1:A:304:MET:HE3	1.91	0.51
3:C:89:LEU:HD12	3:C:203:ASN:HB3	1.91	0.51
1:F:235:ARG:HB3	1:F:238:GLU:HG3	1.91	0.51
2:B:79:GLY:HA2	2:B:111:LEU:HD21	1.93	0.51
3:C:162:GLN:HG3	3:C:177:LYS:HZ2	1.75	0.51
2:B:195:ARG:HB3	2:B:197:GLU:OE1	2.10	0.51
2:B:373:ALA:HB2	2:B:378:LEU:HD13	1.93	0.51
1:F:202:ILE:HG12	1:F:215:LEU:HD12	1.92	0.51
1:F:260:ARG:HD2	1:F:265:PHE:CE1	2.45	0.51
1:A:634:ARG:HD3	1:A:711:MET:HE1	1.93	0.51
5:E:42:ASP:HA	5:E:45:LYS:NZ	2.19	0.51
1:A:560:ASP:HA	1:A:679:ALA:HB3	1.92	0.50
2:B:353:ASP:HB3	2:B:355:ARG:HG3	1.92	0.50
3:C:56:MET:HE2	3:C:56:MET:HA	1.92	0.50
3:C:123:VAL:O	3:C:127:LYS:HG2	2.11	0.50
4:D:160:THR:O	4:D:164:THR:HG23	2.11	0.50
4:D:161:THR:O	4:D:165:LYS:HG2	2.11	0.50
1:F:100:ILE:HD12	1:F:129:ARG:HG2	1.93	0.50
1:F:130:ASN:O	1:F:134:LYS:HG2	2.12	0.50
1:A:62:THR:O	1:A:66:LEU:HG	2.11	0.50
3:C:31:TYR:HA	3:C:34:GLN:HG2	1.93	0.50
3:C:91:LEU:HD23	3:C:207:ALA:HA	1.94	0.50
1:A:147:TYR:HE2	1:A:175:ALA:HB2	1.77	0.50
1:A:535:SER:HB2	1:A:566:LYS:HG2	1.93	0.50
4:D:233:LYS:O	4:D:237:ILE:HG22	2.12	0.50
1:F:71:MET:HA	1:F:74:LEU:HD23	1.93	0.50

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:100:ILE:HD11	1:F:129:ARG:HA	1.92	0.50
2:B:348:TRP:HB3	2:B:357:VAL:HB	1.94	0.50
3:C:97:THR:HA	3:C:106:LEU:HA	1.94	0.50
3:C:103:THR:HG23	3:C:177:LYS:HB3	1.93	0.50
1:A:674:TYR:HB3	1:A:691:ALA:HB2	1.93	0.49
3:C:109:GLU:HA	3:C:171:GLN:HG2	1.94	0.49
1:A:303:LYS:HG3	1:A:304:MET:CE	2.42	0.49
3:C:148:TRP:HH2	3:C:204:VAL:HG11	1.77	0.49
1:F:246:ALA:HB1	1:F:256:VAL:HG11	1.94	0.49
1:A:324:SER:C	1:A:325:MET:HE2	2.36	0.49
2:B:341:ASP:HB3	2:B:345:TYR:H	1.77	0.49
1:A:77:VAL:HG13	1:F:26:ASP:N	2.28	0.49
1:F:63:ASP:HA	1:F:66:LEU:HB3	1.93	0.49
1:A:197:PHE:HB2	1:A:200:ARG:NH2	2.27	0.49
1:A:200:ARG:HA	1:A:200:ARG:NE	2.28	0.49
2:B:297:TYR:HB3	2:B:337:LEU:HD21	1.95	0.49
1:A:495:GLN:HG3	1:A:505:THR:HG23	1.95	0.49
2:B:60:TYR:HD1	2:B:61:SER:N	2.10	0.49
2:B:166:THR:HG23	2:B:168:ASN:H	1.78	0.49
2:B:341:ASP:H	2:B:367:PHE:HD2	1.59	0.49
4:D:191:TRP:HA	4:D:194:VAL:HG12	1.93	0.49
3:C:165:VAL:HG13	3:C:174:VAL:HG22	1.94	0.49
1:F:91:ILE:HG21	1:F:136:MET:SD	2.53	0.49
5:E:32:ILE:HB	5:E:80:GLN:HB3	1.95	0.49
1:F:115:ARG:HA	1:F:118:LEU:HD12	1.95	0.49
2:B:67:LEU:HD21	2:B:375:ASP:HB2	1.94	0.49
2:B:247:VAL:HG23	2:B:261:LEU:O	2.12	0.49
1:A:303:LYS:HG3	1:A:304:MET:HE3	1.94	0.48
1:A:159:PRO:O	1:A:160:ARG:HG2	2.12	0.48
3:C:127:LYS:HB3	3:C:129:TYR:CE1	2.48	0.48
4:D:52:ILE:O	4:D:56:GLU:HG3	2.13	0.48
4:D:89:GLN:HE22	4:D:115:THR:HG23	1.78	0.48
1:A:483:VAL:HG12	1:A:517:PHE:HB3	1.95	0.48
2:B:127:GLU:HA	2:B:150:GLU:HB2	1.94	0.48
2:B:207:ALA:HB2	2:B:221:MET:HE3	1.95	0.48
2:B:292:ASP:HB3	2:B:297:TYR:HE1	1.78	0.48
2:B:368:GLN:HB3	2:B:383:LYS:HB3	1.96	0.48
3:C:117:TRP:HH2	3:C:141:LEU:HB3	1.78	0.48
1:A:421:ARG:HH21	1:A:777:MET:HG2	1.78	0.48
3:C:31:TYR:CZ	3:C:32:LYS:HE3	2.48	0.48
1:A:109:MET:HA	1:A:112:GLN:CD	2.38	0.48

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:368:GLU:HG3	1:A:388:ARG:HE	1.77	0.48
2:B:283:LEU:HD12	2:B:306:MET:HE3	1.96	0.48
1:F:174:LEU:HD23	1:F:273:LEU:HA	1.95	0.48
4:D:194:VAL:O	4:D:198:VAL:HG12	2.14	0.48
4:D:38:THR:HG23	4:D:54:GLN:OE1	2.13	0.48
1:F:256:VAL:HB	1:F:268:LEU:HG	1.96	0.48
1:F:97:ASP:HA	1:F:129:ARG:HH12	1.78	0.47
1:A:655:GLY:HA2	1:A:660:VAL:HB	1.96	0.47
3:C:192:ALA:HA	3:C:195:GLN:HE21	1.79	0.47
3:C:33:ARG:HH22	3:C:196:ARG:HH12	1.61	0.47
1:A:92:PRO:HB2	1:A:163:VAL:HG22	1.96	0.47
2:B:351:VAL:HG13	2:B:352:GLU:HG3	1.96	0.47
4:D:186:THR:HB	4:D:194:VAL:HG21	1.95	0.47
1:A:681:ASN:CG	1:A:688:TYR:HB3	2.39	0.47
3:C:59:PRO:HG2	4:D:202:LEU:HD23	1.96	0.47
1:F:28:VAL:HG13	1:F:36:VAL:HB	1.97	0.47
1:F:49:VAL:HG23	1:F:226:LEU:HB3	1.97	0.47
1:F:111:LEU:HD21	1:F:125:TYR:HE1	1.80	0.47
1:F:413:TRP:HD1	1:F:414:MET:HE2	1.78	0.47
1:A:137:LEU:HG	1:A:167:LEU:HD21	1.97	0.47
1:A:188:PHE:CZ	1:A:233:ARG:HD2	2.50	0.47
1:F:111:LEU:HG	1:F:115:ARG:HE	1.79	0.47
4:D:199:GLU:OE1	5:E:67:PRO:HG3	2.14	0.47
5:E:67:PRO:HD2	5:E:68:PHE:CE2	2.50	0.47
1:F:183:LEU:HD12	1:F:264:GLY:HA2	1.96	0.47
2:B:97:LEU:HD12	2:B:97:LEU:O	2.15	0.46
1:F:71:MET:O	1:F:75:ILE:HG13	2.14	0.46
2:B:360:GLN:HG3	2:B:362:VAL:HG13	1.97	0.46
3:C:117:TRP:HB3	3:C:118:PRO:HD3	1.97	0.46
3:C:145:TRP:HB3	3:C:158:ARG:NH1	2.31	0.46
2:B:346:LEU:HB3	2:B:360:GLN:HB3	1.98	0.46
3:C:117:TRP:CE3	3:C:139:GLN:HB3	2.50	0.46
1:A:369:MET:HA	1:A:369:MET:HE2	1.97	0.46
1:A:717:GLU:OE1	1:A:717:GLU:HA	2.16	0.46
3:C:99:PHE:HA	3:C:104:ALA:HA	1.97	0.46
2:B:190:PRO:HD3	2:B:213:ASN:HA	1.97	0.46
1:F:84:GLY:C	1:F:90:LYS:HZ1	2.23	0.46
1:F:397:ALA:HA	1:F:400:MET:HB3	1.97	0.46
1:F:51:LEU:O	1:F:55:GLN:HG2	2.15	0.46
4:D:42:LYS:HD3	4:D:42:LYS:HA	1.67	0.46
1:A:109:MET:O	1:A:112:GLN:HG2	2.16	0.46

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:102:ASN:O	1:F:106:GLN:HG3	2.15	0.46
2:B:365:SER:HB2	2:B:382:ALA:HB1	1.98	0.46
1:A:94:ILE:HD12	1:A:123:GLU:HB2	1.98	0.46
1:A:488:ARG:HB2	1:A:512:ASP:OD1	2.16	0.46
2:B:52:VAL:HG23	2:B:82:LYS:HB2	1.98	0.46
2:B:85:ASN:HB2	2:B:92:ILE:HD11	1.97	0.46
2:B:246:ASP:OD1	2:B:246:ASP:C	2.59	0.46
4:D:148:SER:O	4:D:152:ARG:HG2	2.15	0.46
1:A:272:GLU:HB2	1:A:338:ARG:HG2	1.98	0.45
1:A:478:PHE:HB3	1:A:483:VAL:HG23	1.97	0.45
3:C:33:ARG:NH2	3:C:196:ARG:HH12	2.13	0.45
1:F:28:VAL:HG11	1:F:31:VAL:HG22	1.98	0.45
1:A:502:SER:HB3	1:A:682:TYR:OH	2.16	0.45
2:B:104:PHE:O	2:B:104:PHE:CD1	2.70	0.45
1:A:542:GLN:HA	1:A:673:VAL:O	2.15	0.45
1:F:213:GLY:O	1:F:217:ILE:HG13	2.16	0.45
1:A:778:SER:C	1:A:780:LEU:H	2.24	0.45
4:D:92:ILE:O	4:D:96:ILE:HG22	2.16	0.45
4:D:137:PRO:HB3	4:D:173:ARG:NH1	2.31	0.45
1:A:598:LYS:HB2	1:A:598:LYS:HE3	1.65	0.45
1:F:43:ASP:O	1:F:47:GLN:HG2	2.16	0.45
1:A:439:SER:HA	1:A:463:ASN:HD21	1.82	0.45
1:A:546:TRP:CZ3	1:A:556:PRO:HG2	2.52	0.45
1:A:768:MET:HB2	1:A:768:MET:HE2	1.73	0.45
2:B:317:TRP:CD1	2:B:353:ASP:H	2.35	0.45
1:A:189:THR:HG23	1:A:192:GLU:H	1.82	0.45
1:A:284:ILE:HG23	1:A:308:ILE:HD11	1.97	0.45
2:B:194:LEU:HD12	2:B:195:ARG:N	2.27	0.45
4:D:53:THR:HA	4:D:56:GLU:OE1	2.15	0.45
1:A:312:LEU:HD23	1:A:312:LEU:HA	1.79	0.45
2:B:291:VAL:HG12	2:B:296:ILE:HD12	1.98	0.45
4:D:79:TYR:HB3	4:D:88:ALA:HB2	1.99	0.45
4:D:192:VAL:HG13	5:E:64:MET:HE3	1.98	0.45
3:C:148:TRP:CH2	3:C:204:VAL:HG11	2.52	0.44
1:A:176:GLU:HA	1:A:212:ARG:O	2.17	0.44
2:B:82:LYS:HB3	2:B:84:LEU:HD21	1.98	0.44
1:A:67:PHE:HD2	1:F:36:VAL:HG21	1.82	0.44
1:A:430:ILE:HG13	1:A:431:GLY:H	1.81	0.44
1:F:72:GLU:HG3	1:F:76:MET:CE	2.47	0.44
3:C:145:TRP:CE3	3:C:159:GLY:HA2	2.53	0.44
1:A:42:ALA:O	1:A:46:MET:HE1	2.18	0.44

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:111:LYS:O	1:A:114:LEU:HG	2.17	0.44
2:B:104:PHE:CZ	2:B:106:LYS:HB2	2.53	0.44
2:B:195:ARG:HA	2:B:195:ARG:HD2	1.81	0.44
1:A:67:PHE:CD2	1:F:36:VAL:HG21	2.52	0.44
3:C:163:ILE:HG13	3:C:176:VAL:HG13	1.98	0.44
1:F:174:LEU:HD21	1:F:273:LEU:HD23	1.99	0.44
1:F:236:ILE:HG13	1:F:237:GLN:HG3	1.99	0.44
1:A:64:ARG:NH1	1:F:36:VAL:HG23	2.32	0.44
1:A:267:LYS:HE3	1:A:267:LYS:HB2	1.77	0.44
1:A:200:ARG:HG2	1:A:200:ARG:HH11	1.83	0.43
1:A:324:SER:HB3	1:A:337:LEU:HD11	2.00	0.43
2:B:316:LEU:HD23	2:B:316:LEU:HA	1.86	0.43
3:C:83:ARG:HH11	3:C:83:ARG:HG2	1.83	0.43
4:D:186:THR:HG21	4:D:217:LEU:HD22	1.99	0.43
1:A:483:VAL:HA	1:A:516:GLY:O	2.18	0.43
3:C:200:GLU:O	3:C:204:VAL:HG13	2.18	0.43
1:F:126:ASN:O	1:F:129:ARG:HB2	2.18	0.43
1:A:386:LYS:HD2	1:A:400:THR:HG22	2.01	0.43
2:B:128:LYS:HD2	2:B:128:LYS:HA	1.77	0.43
1:A:674:TYR:HE2	1:A:690:CYS:HB3	1.83	0.43
2:B:278:MET:CG	1:F:156:GLU:OE2	2.59	0.43
2:B:305:VAL:HG22	2:B:319:GLN:HB3	2.00	0.43
1:F:145:GLU:O	1:F:149:ARG:HG3	2.18	0.43
1:A:542:GLN:HE21	1:A:674:TYR:HE1	1.67	0.43
1:A:583:ARG:HH21	1:A:586:PHE:HB2	1.82	0.43
3:C:83:ARG:HD3	3:C:84:PRO:O	2.19	0.43
1:A:552:MET:HE1	1:A:565:PHE:HE1	1.82	0.43
1:A:719:ILE:HG12	1:A:736:SER:HB3	2.01	0.43
2:B:308:LEU:HG	2:B:315:THR:HA	2.01	0.43
3:C:56:MET:SD	5:E:68:PHE:HB3	2.58	0.43
1:F:413:TRP:CD1	1:F:414:MET:HE2	2.53	0.43
1:A:647:PRO:HB2	1:A:650:GLU:OE1	2.18	0.43
2:B:93:TRP:HZ3	2:B:95:VAL:HG22	1.83	0.43
4:D:32:PRO:HA	4:D:35:ILE:HD11	2.01	0.43
2:B:288:ASP:C	2:B:288:ASP:OD1	2.62	0.43
1:F:50:LYS:HG2	1:F:60:LEU:HD21	2.01	0.43
1:F:75:ILE:O	1:F:79:ILE:HG23	2.19	0.43
2:B:279:TRP:CD1	2:B:312:GLY:HA2	2.54	0.43
3:C:196:ARG:HG2	3:C:200:GLU:OE2	2.19	0.43
1:F:100:ILE:HD13	1:F:128:TYR:CE1	2.54	0.43
3:C:148:TRP:CE3	3:C:201:MET:HE1	2.53	0.42

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:149:ARG:NH1	1:F:413:TRP:HB2	2.34	0.42
2:B:102:GLY:H	2:B:105:SER:HA	1.83	0.42
2:B:112:SER:H	2:B:126:SER:HA	1.84	0.42
3:C:68:PRO:HG3	4:D:152:ARG:CZ	2.49	0.42
1:F:32:VAL:HG23	1:F:422:TYR:O	2.19	0.42
1:A:304:MET:N	1:A:304:MET:HE2	2.34	0.42
1:A:634:ARG:HB3	1:A:713:VAL:HG22	2.02	0.42
2:B:267:LEU:O	2:B:280:LYS:HA	2.18	0.42
2:B:296:ILE:HG12	2:B:310:ILE:HG22	2.01	0.42
3:C:80:LEU:HD11	4:D:159:TYR:HD1	1.83	0.42
4:D:81:LYS:HA	4:D:81:LYS:HD2	1.59	0.42
1:F:155:GLN:HG2	1:F:156:GLU:N	2.34	0.42
1:A:46:MET:HE3	1:A:46:MET:H	1.85	0.42
1:A:227:ARG:HA	1:A:238:PHE:CE2	2.52	0.42
3:C:40:ALA:HA	3:C:43:GLU:HG3	2.02	0.42
3:C:145:TRP:NE1	3:C:160:ARG:HH12	2.18	0.42
4:D:204:ASP:HB3	4:D:205:TYR:CE1	2.54	0.42
1:F:196:GLU:O	1:F:200:ARG:HG3	2.19	0.42
2:B:111:LEU:HD22	2:B:111:LEU:H	1.84	0.42
4:D:132:ARG:HE	4:D:132:ARG:HB3	1.63	0.42
1:A:287:LEU:HD23	1:A:308:ILE:HD12	2.02	0.42
2:B:46:THR:HA	2:B:389:SER:O	2.20	0.42
3:C:50:LEU:HD12	3:C:50:LEU:HA	1.80	0.42
3:C:201:MET:N	3:C:201:MET:HE2	2.34	0.42
1:A:586:PHE:CE2	1:A:777:MET:HE1	2.55	0.42
2:B:187:LEU:HD13	2:B:187:LEU:HA	1.87	0.42
2:B:168:ASN:HA	2:B:189:MET:HE1	2.02	0.42
2:B:377:LYS:H	2:B:377:LYS:HG3	1.71	0.42
1:F:96:LEU:HD21	1:F:129:ARG:HB3	2.01	0.42
1:A:327:GLU:O	1:A:335:VAL:HA	2.20	0.42
1:A:675:PHE:CE2	1:A:699:LEU:HD21	2.55	0.42
1:F:83:MET:HA	1:F:87:MET:HE1	2.02	0.42
1:A:100:SER:O	1:A:168:VAL:HA	2.19	0.42
1:A:371:GLN:HE21	1:A:378:GLY:H	1.68	0.42
3:C:31:TYR:OH	3:C:32:LYS:HE3	2.20	0.42
1:F:134:LYS:HA	1:F:137:ILE:HG22	2.02	0.42
1:A:678:GLN:HA	1:A:693:GLN:OE1	2.19	0.41
2:B:45:THR:H	2:B:391:THR:HG22	1.84	0.41
2:B:345:TYR:CE1	2:B:361:LYS:HD3	2.55	0.41
3:C:102:ASP:HB2	3:C:178:LEU:HB3	2.01	0.41
1:F:399:ARG:HH12	1:F:402:MET:HE2	1.83	0.41

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:267:LYS:HA	1:A:295:LEU:HA	2.02	0.41
1:A:545:MET:HB3	1:A:648:PHE:CE2	2.56	0.41
3:C:120:VAL:HG12	3:C:209:LEU:HD21	2.02	0.41
1:A:206:TRP:CD1	1:A:206:TRP:H	2.37	0.41
5:E:31:ASP:OD1	5:E:81:PRO:HA	2.20	0.41
1:A:570:PHE:O	1:A:601:ILE:HG12	2.21	0.41
1:A:250:ASP:HB3	1:A:252:LYS:HZ3	1.85	0.41
3:C:106:LEU:HG	3:C:174:VAL:HB	2.02	0.41
3:C:148:TRP:O	3:C:156:GLN:HB3	2.21	0.41
1:F:128:TYR:O	1:F:132:ILE:HG12	2.20	0.41
1:A:552:MET:HE1	1:A:565:PHE:CE1	2.56	0.41
1:A:728:LYS:HB2	1:A:728:LYS:HE3	1.84	0.41
2:B:378:LEU:HB3	2:B:390:ILE:HB	2.03	0.41
3:C:88:PRO:HD3	3:C:99:PHE:CD1	2.56	0.41
1:F:156:GLU:C	1:F:160:LEU:CD2	2.89	0.41
1:A:72:PHE:HB3	1:A:75:VAL:HG23	2.03	0.41
2:B:345:TYR:HB3	2:B:347:HIS:CE1	2.56	0.41
3:C:115:THR:C	3:C:118:PRO:HD2	2.45	0.41
3:C:150:ARG:HA	3:C:150:ARG:NE	2.36	0.41
1:A:230:TYR:HD1	1:A:230:TYR:HA	1.71	0.41
1:A:550:TYR:CE1	1:A:555:HIS:HA	2.56	0.41
1:A:552:MET:HE3	1:A:552:MET:HB3	1.76	0.41
1:A:595:LEU:HD12	1:A:613:LEU:HD13	2.03	0.41
3:C:149:ASN:HA	3:C:156:GLN:CD	2.46	0.41
4:D:31:PRO:HD2	4:D:34:GLU:OE2	2.21	0.41
4:D:92:ILE:HD11	4:D:112:ARG:HB2	2.02	0.41
1:F:76:MET:HA	1:F:79:ILE:HG12	2.02	0.41
1:F:156:GLU:O	1:F:160:LEU:HD23	2.08	0.41
1:A:446:GLN:C	1:A:448:ASN:H	2.28	0.41
1:A:681:ASN:HB2	1:A:692:THR:HB	2.03	0.41
2:B:252:VAL:HG11	2:B:291:VAL:HG11	2.03	0.41
2:B:326:LEU:HB2	2:B:342:SER:HB3	2.03	0.41
3:C:84:PRO:HA	3:C:85:PRO:HD3	1.96	0.41
3:C:133:GLN:O	3:C:141:LEU:HA	2.20	0.41
1:F:77:ASP:OD1	1:F:77:ASP:C	2.64	0.41
1:A:539:MET:H	1:A:539:MET:CE	2.34	0.40
1:A:539:MET:H	1:A:539:MET:HE3	1.85	0.40
4:D:112:ARG:HG2	4:D:146:ASP:OD2	2.20	0.40
1:F:132:ILE:HG22	1:F:136:MET:HE2	2.03	0.40
1:A:91:ARG:HA	1:A:92:PRO:HD3	1.99	0.40
1:A:504:TYR:CZ	1:A:506:ASN:HB2	2.56	0.40

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:654:ALA:HB3	1:A:668:ILE:HB	2.04	0.40
5:E:80:GLN:HG2	5:E:86:VAL:HG12	2.02	0.40
1:F:100:ILE:HG12	1:F:132:ILE:HG21	2.03	0.40
1:A:439:SER:HA	1:A:463:ASN:ND2	2.36	0.40
1:A:497:ASP:HB2	1:A:503:ASP:HB2	2.03	0.40
4:D:215:LEU:O	4:D:218:MET:HB2	2.22	0.40
1:F:96:LEU:HD13	1:F:133:ARG:HB2	2.04	0.40
1:A:726:SER:OG	1:A:728:LYS:HG3	2.21	0.40
1:A:74:ASP:HB2	1:A:89:LYS:HG3	2.03	0.40
1:A:678:GLN:HA	1:A:693:GLN:HB3	2.03	0.40
2:B:55:GLY:HA3	2:B:384:ASP:HA	2.04	0.40
2:B:63:LEU:HD21	2:B:111:LEU:O	2.22	0.40
3:C:178:LEU:HD11	3:C:181:LEU:HB2	2.03	0.40
4:D:111:MET:O	4:D:115:THR:HG22	2.21	0.40
5:E:110:LEU:HD23	5:E:110:LEU:HA	1.86	0.40
1:F:78:GLN:O	1:F:82:GLN:HG2	2.22	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	780/1222 (64%)	748 (96%)	32 (4%)	0	100	100
1	F	265/1222 (22%)	254 (96%)	11 (4%)	0	100	100
2	B	364/392 (93%)	332 (91%)	32 (9%)	0	100	100
3	C	188/344 (55%)	183 (97%)	5 (3%)	0	100	100
4	D	216/245 (88%)	205 (95%)	11 (5%)	0	100	100
5	E	88/123 (72%)	80 (91%)	8 (9%)	0	100	100
All	All	1901/3548 (54%)	1802 (95%)	99 (5%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	666/1027 (65%)	651 (98%)	15 (2%)	44	63
1	F	228/1027 (22%)	220 (96%)	8 (4%)	32	54
2	B	297/321 (92%)	285 (96%)	12 (4%)	28	51
3	C	153/276 (55%)	153 (100%)	0	100	100
4	D	183/204 (90%)	180 (98%)	3 (2%)	55	69
5	E	78/103 (76%)	78 (100%)	0	100	100
All	All	1605/2958 (54%)	1567 (98%)	38 (2%)	43	63

All (38) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	77	VAL
1	A	119	VAL
1	A	151	VAL
1	A	230	TYR
1	A	247	LEU
1	A	369	MET
1	A	382	VAL
1	A	400	THR
1	A	402	THR
1	A	418	VAL
1	A	444	VAL
1	A	447	ASP
1	A	511	THR
1	A	706	VAL
1	A	774	LEU
2	B	29	VAL
2	B	87	ASP
2	B	103	TRP
2	B	131	VAL

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
2	B	201	THR
2	B	243	ARG
2	B	250	THR
2	B	254	VAL
2	B	267	LEU
2	B	305	VAL
2	B	362	VAL
2	B	387	VAL
4	D	35	ILE
4	D	185	TYR
4	D	208	THR
1	F	26	ASP
1	F	60	LEU
1	F	100	ILE
1	F	128	TYR
1	F	156	GLU
1	F	158	GLU
1	F	251	LYS
1	F	425	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (11) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	286	GLN
1	A	625	HIS
2	B	64	HIS
2	B	287	ASN
2	B	302	ASN
4	D	241	ASN
5	E	52	GLN
1	F	47	GLN
1	F	78	GLN
1	F	82	GLN
1	F	98	GLN

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.

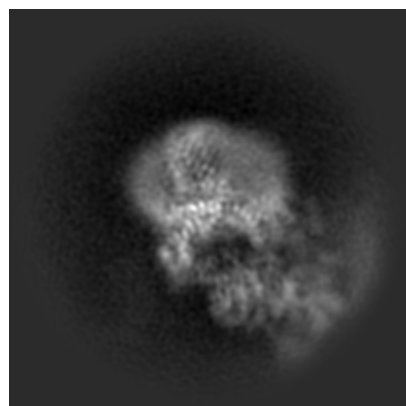
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-66714. These allow visual inspection of the internal detail of the map and identification of artifacts.

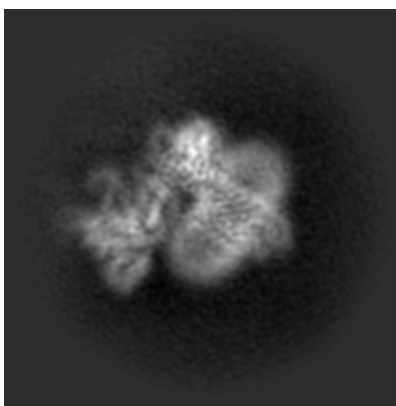
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

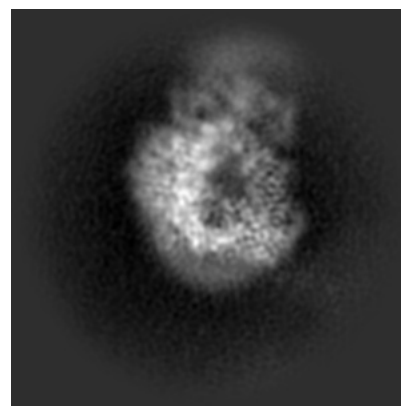
6.1.1 Primary map



X

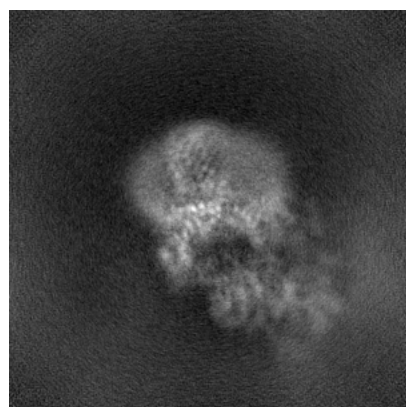


Y

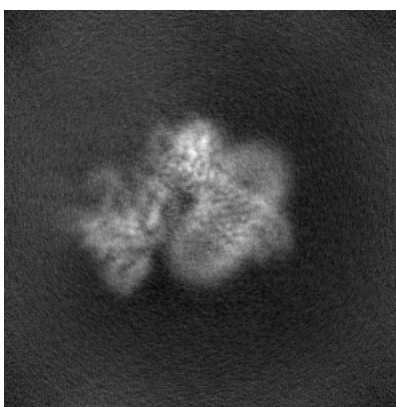


Z

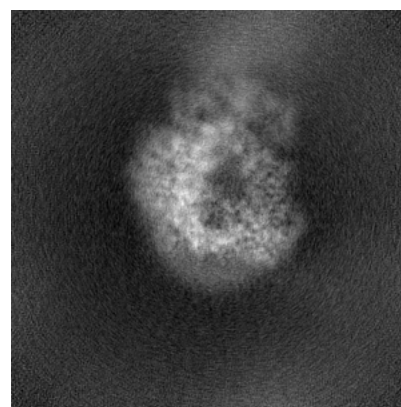
6.1.2 Raw map



X



Y

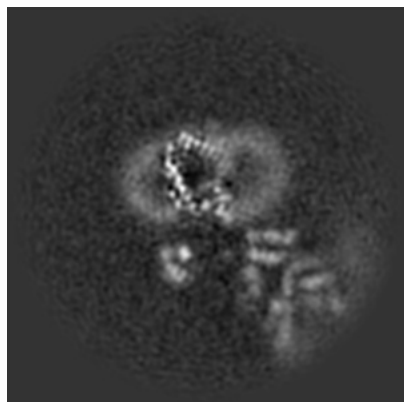


Z

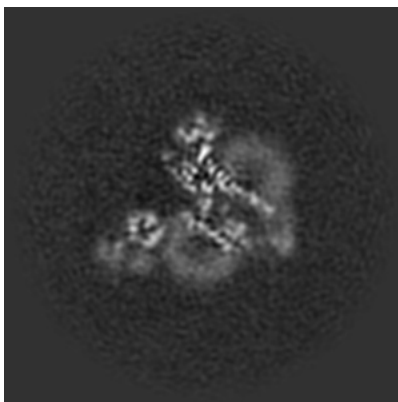
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

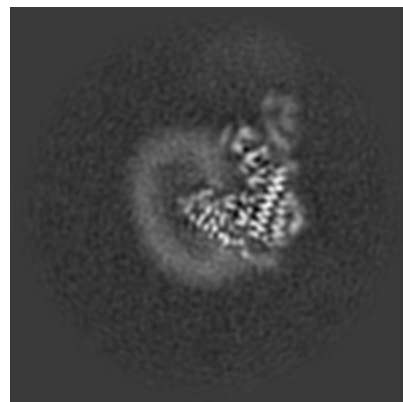
6.2.1 Primary map



X Index: 160

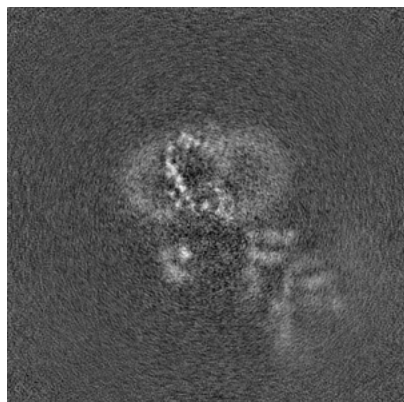


Y Index: 160

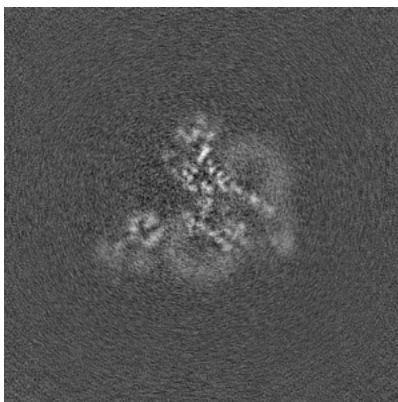


Z Index: 160

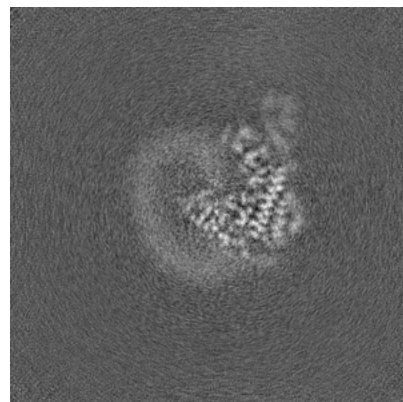
6.2.2 Raw map



X Index: 160



Y Index: 160

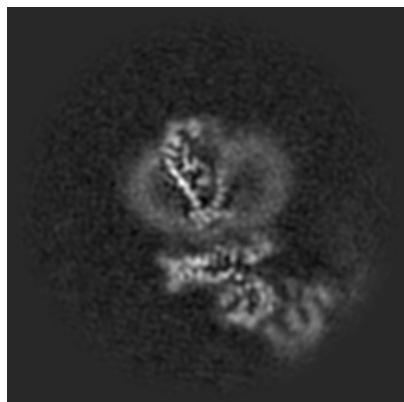


Z Index: 160

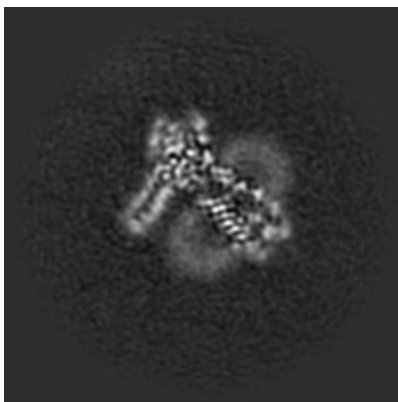
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

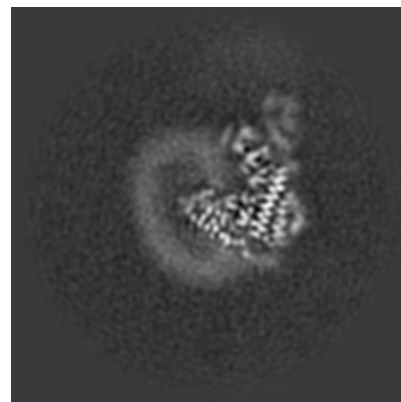
6.3.1 Primary map



X Index: 147

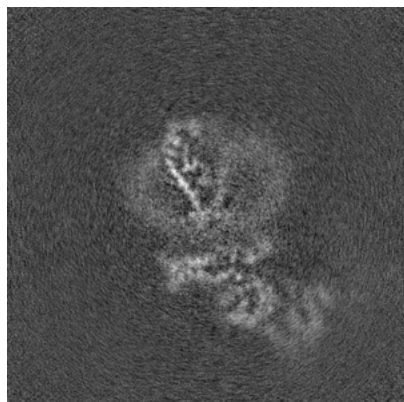


Y Index: 140

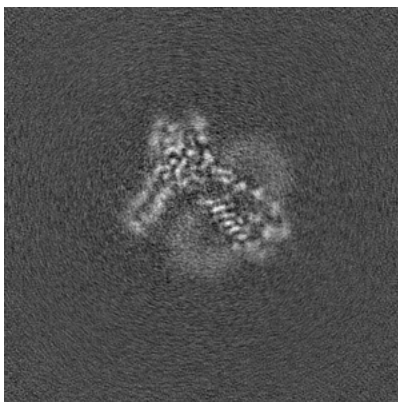


Z Index: 160

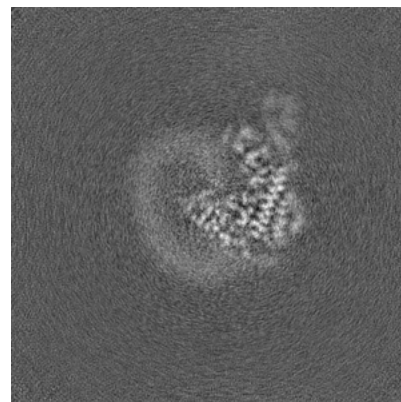
6.3.2 Raw map



X Index: 147



Y Index: 140

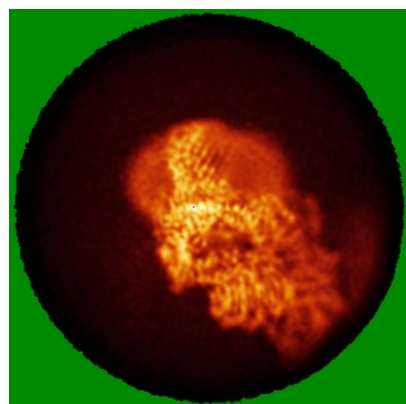


Z Index: 160

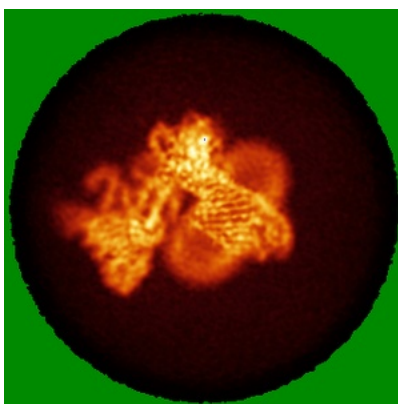
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color) [i](#)

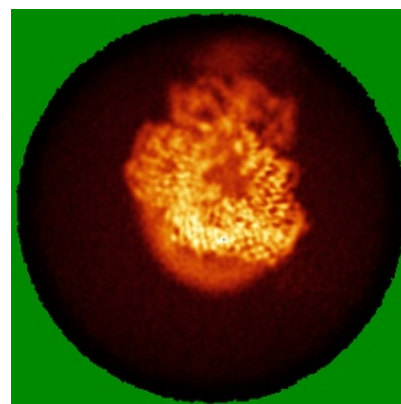
6.4.1 Primary map



X

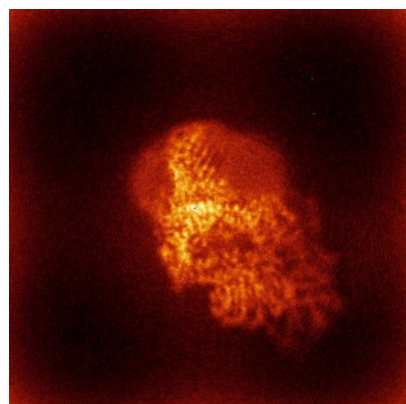


Y

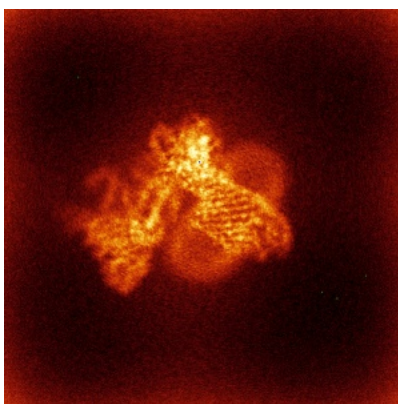


Z

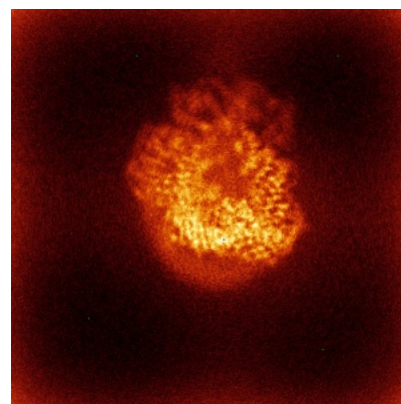
6.4.2 Raw map



X



Y

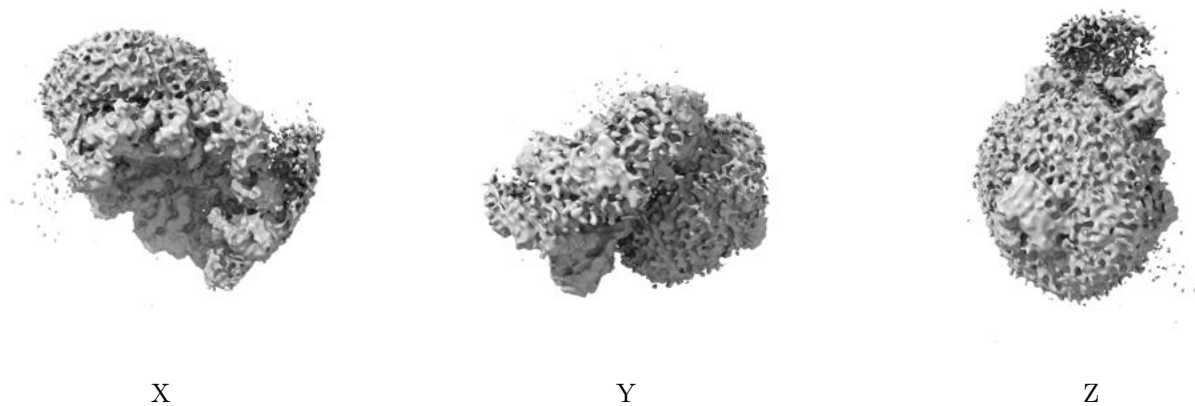


Z

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.

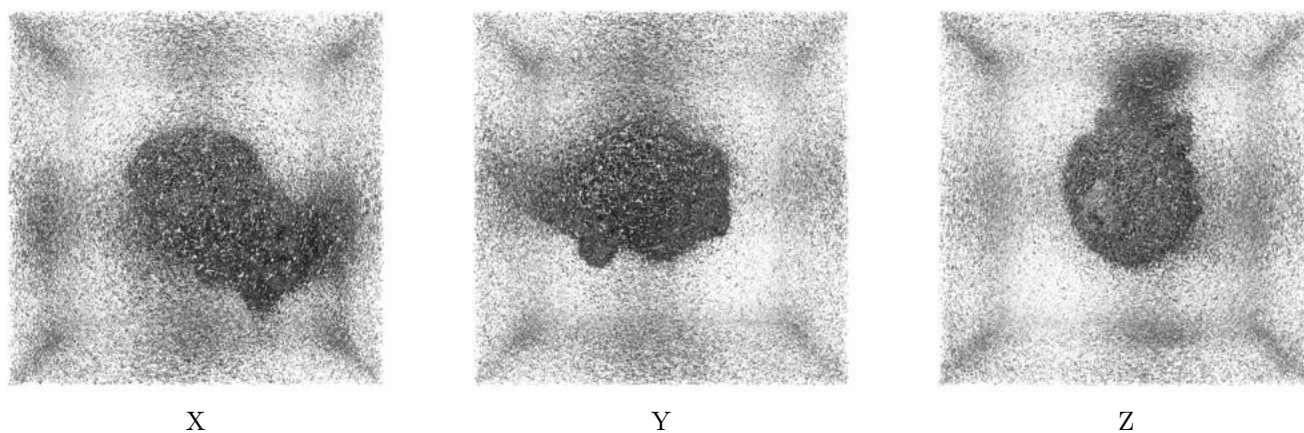
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.05. 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



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.

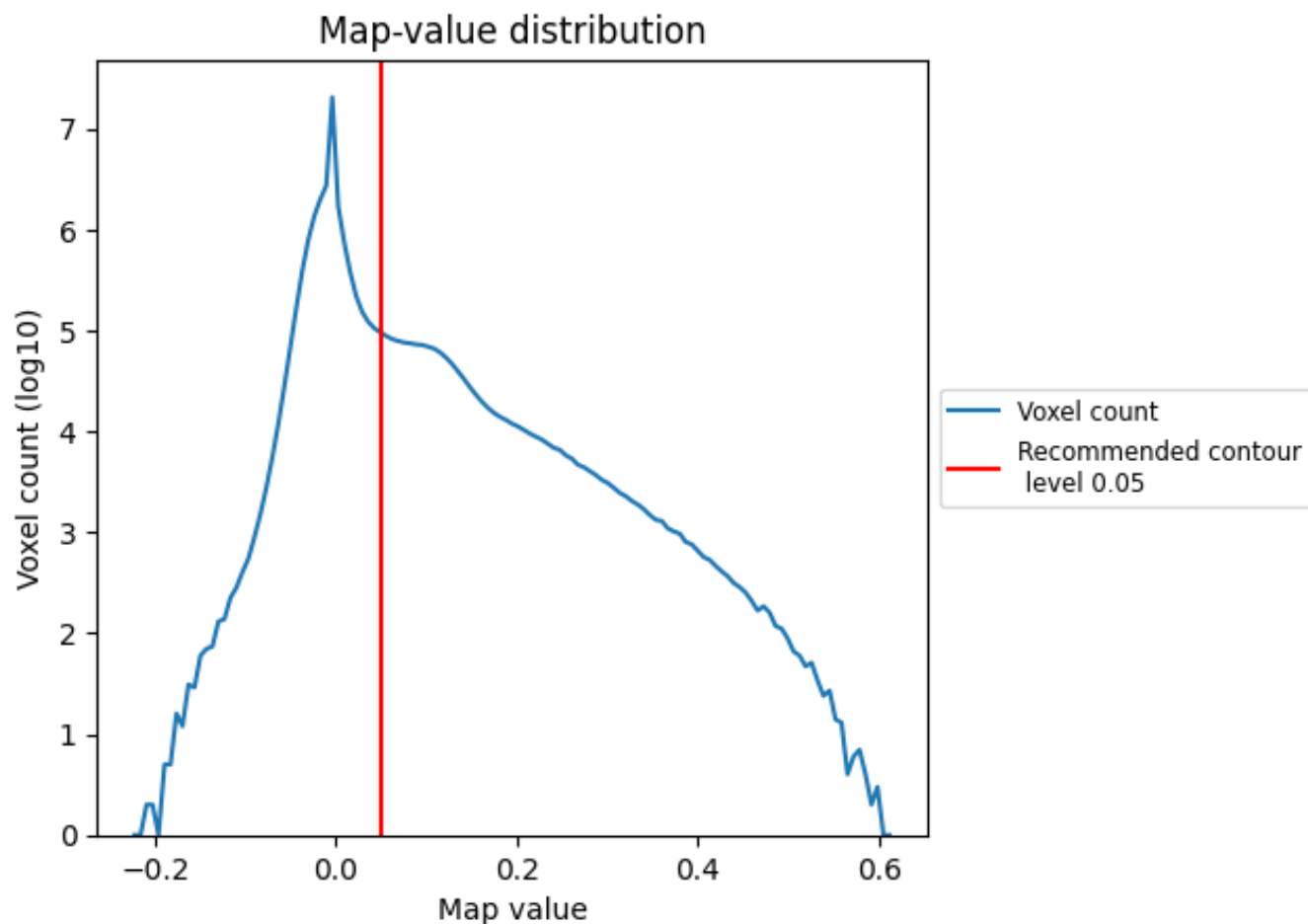
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

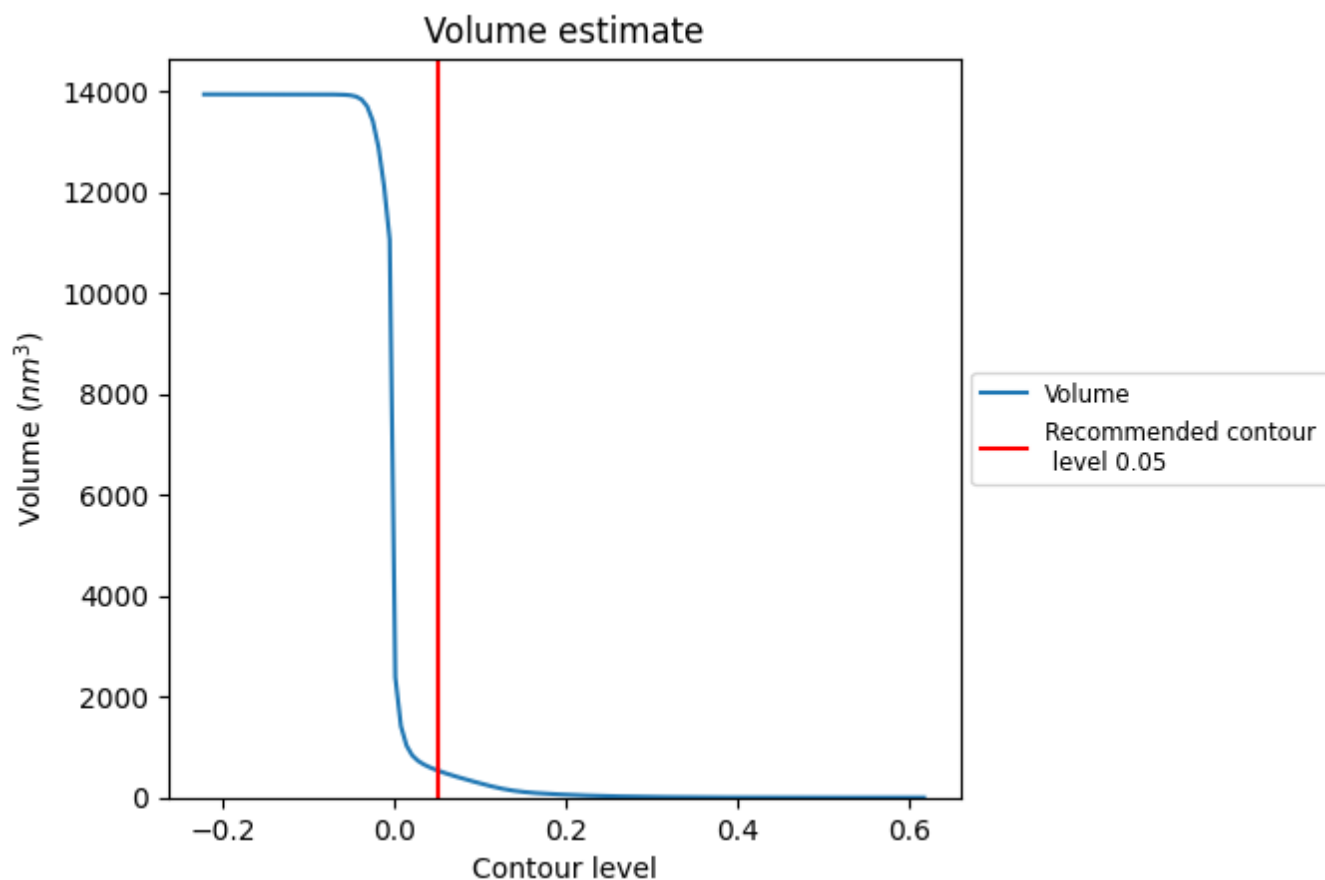
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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.

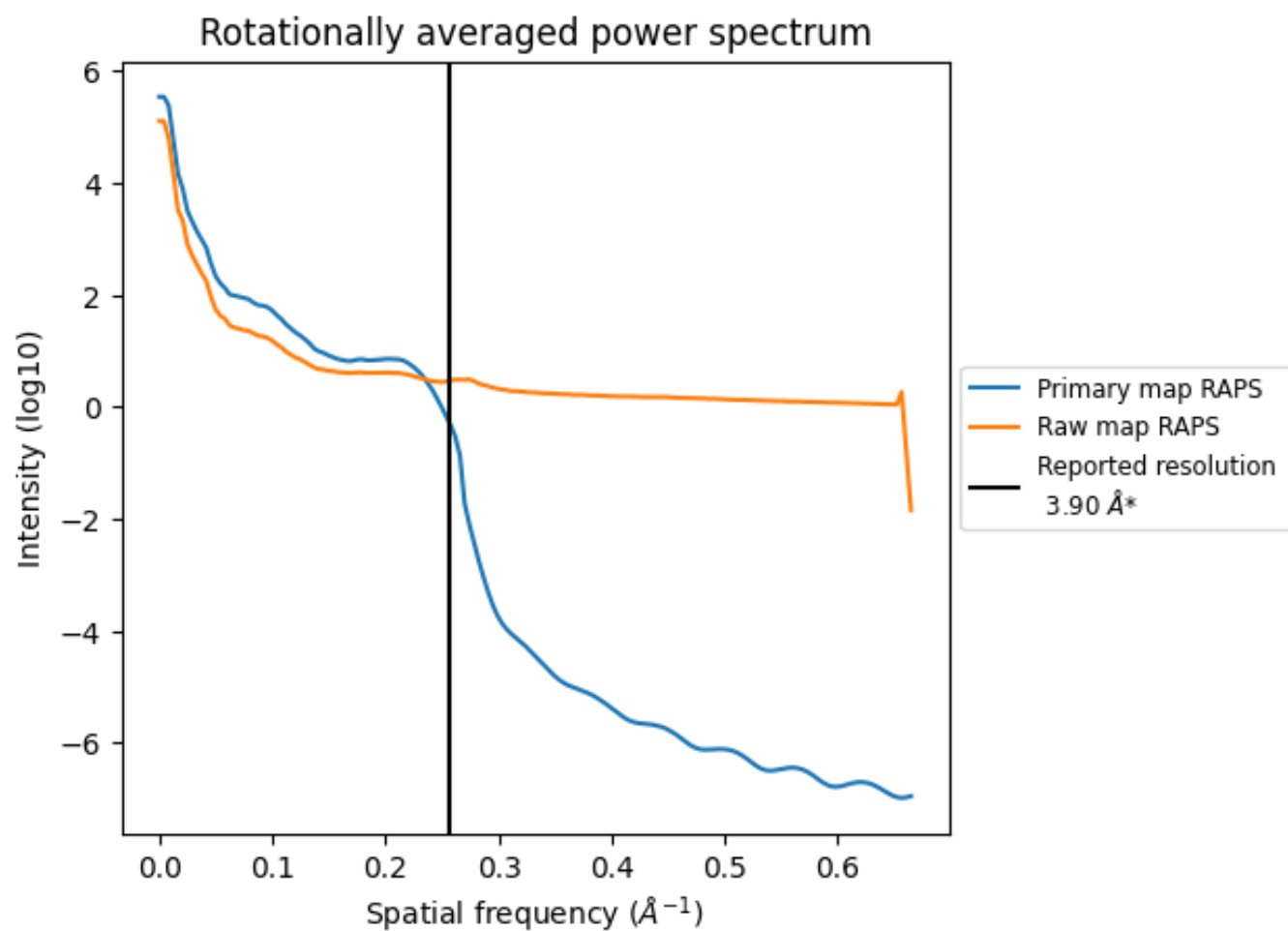
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 538 nm³; this corresponds to an approximate mass of 486 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 ⓘ

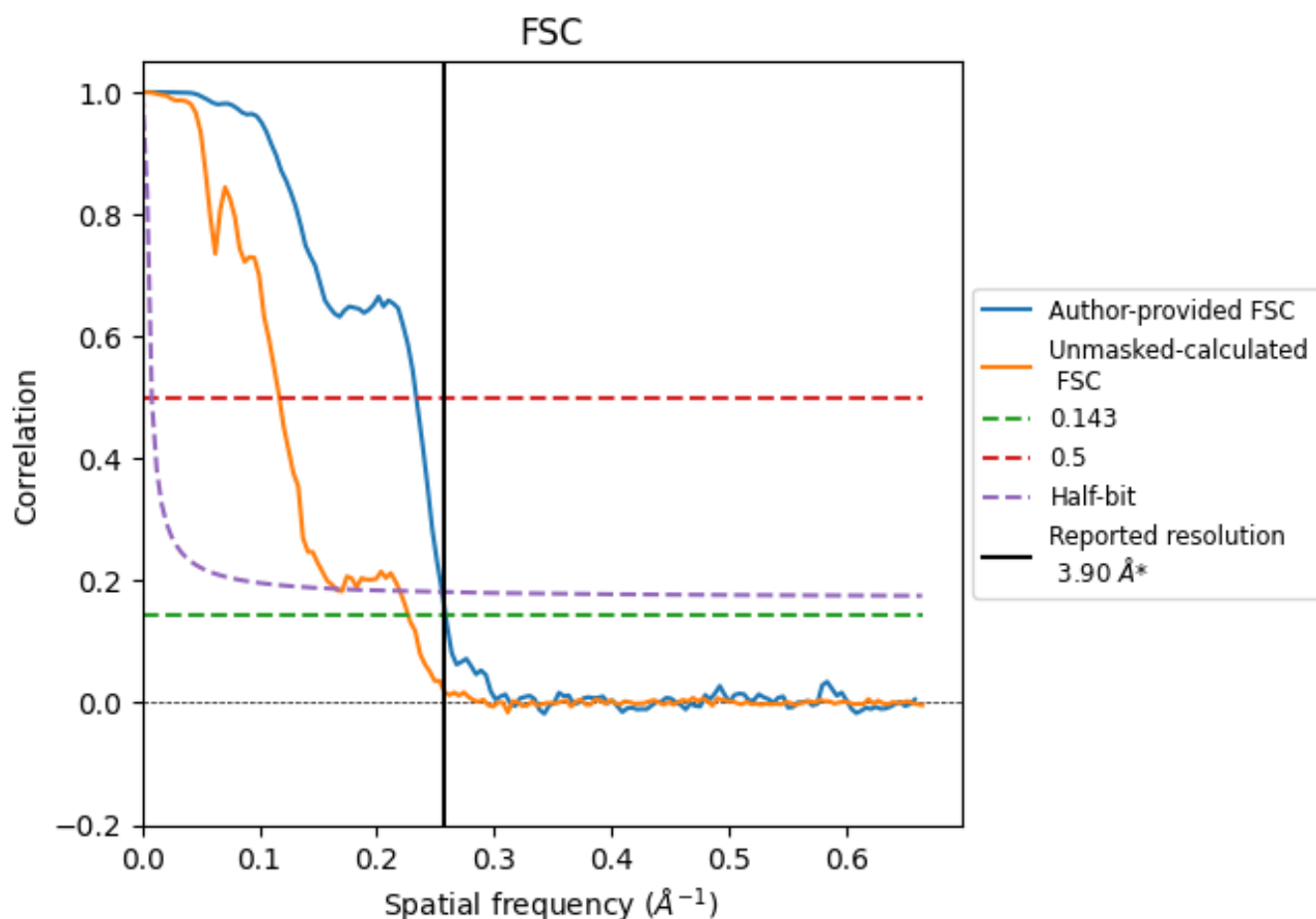


*Reported resolution corresponds to spatial frequency of 0.256 $\text{\AA}^{-1}$

8 Fourier-Shell correlation [i](#)

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of $0.256 \text{ \AA}^{-1}$

8.2 Resolution estimates [i](#)

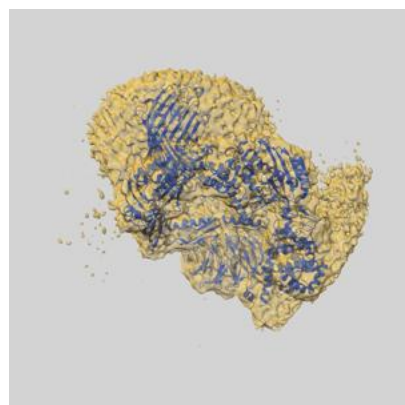
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.90	-	-
Author-provided FSC curve	3.87	4.28	3.91
Unmasked-calculated*	4.41	8.56	6.06

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 4.41 differs from the reported value 3.9 by more than 10 %

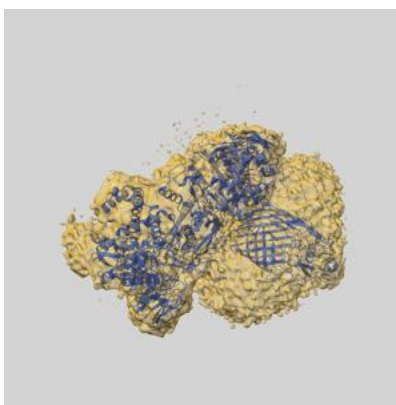
9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-66714 and PDB model 9XBY. Per-residue inclusion information can be found in section [3](#) on page [6](#).

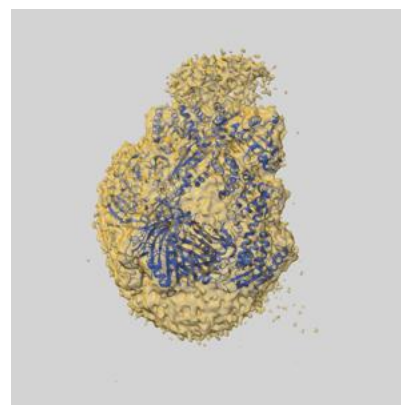
9.1 Map-model overlay [i](#)



X



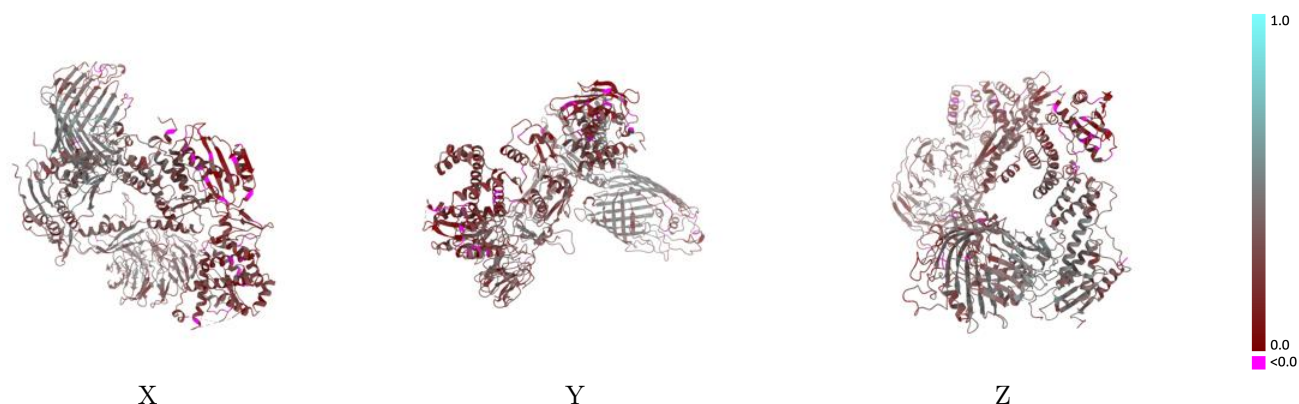
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.05 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](#)



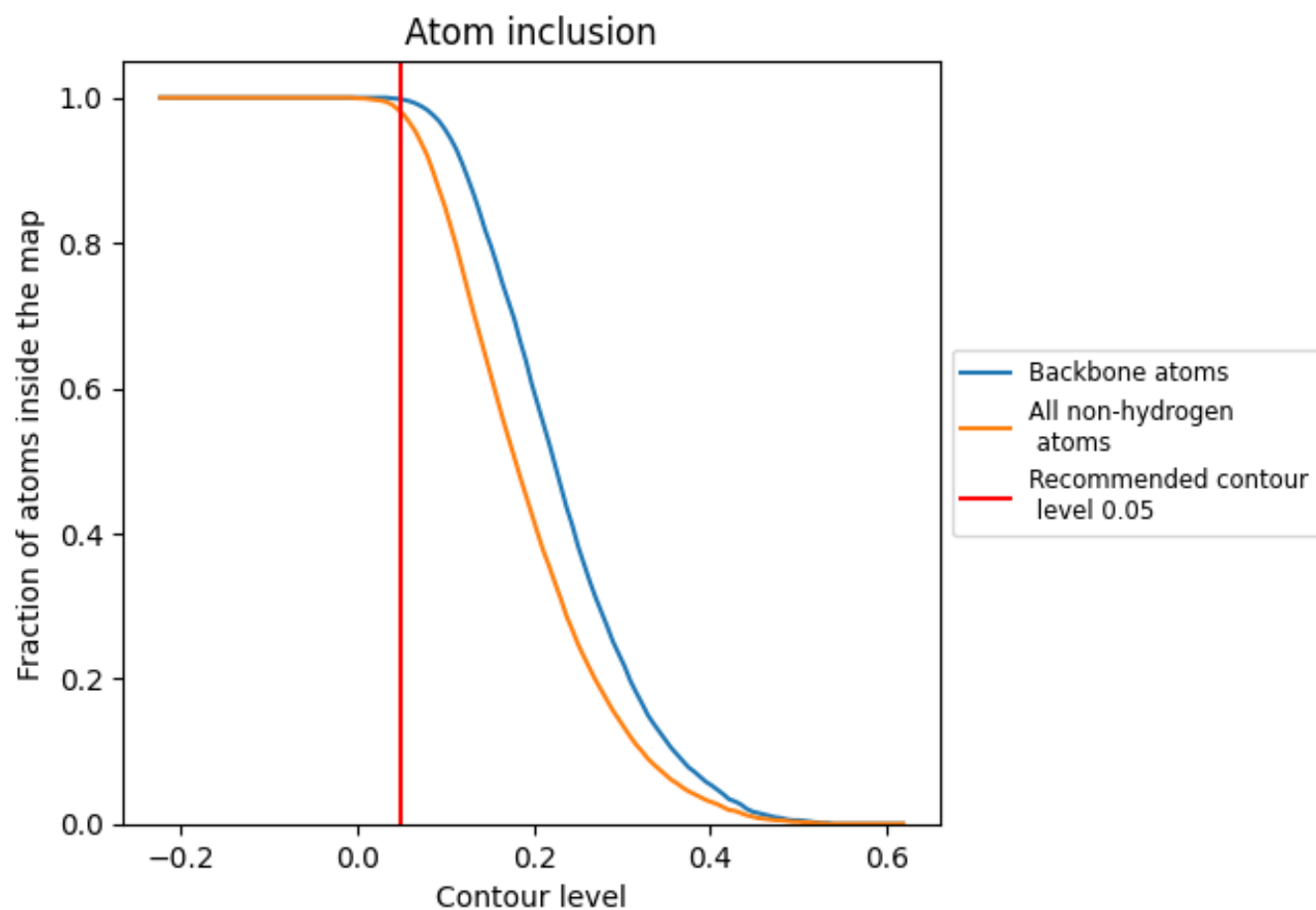
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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](#)



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 (0.05).

9.4 Atom inclusion ⓘ



At the recommended contour level, 100% of all backbone atoms, 98% 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 (0.05) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.9800	0.3140
A	0.9850	0.3530
B	0.9890	0.3180
C	0.9320	0.1990
D	0.9930	0.3670
E	0.9930	0.3790
F	0.9720	0.2060

1.0

0.0

<0.0