Integrative Structure Validation Report ?

October 09, 2025 - 04:49 PM PDT

The following software was used in the production of this report:

IHMValidation Version 3.0
Python-IHM Version 2.5
MolProbity Version 4.5.2
EMDB validation analysis Version 0.0.1.dev127
ChimeraX Version 1.9
Chimera Version 1.19
MapQ Version 1.8.1

PDB ID	9A8F | pdb_00009a8f
PDB-Dev ID	PDBDEV_00000379
Structure Title	Type II Amyloid beta Fibril MEMMI ensemble
Structure Authors	Milanesi, M.; Brotzakis, Z.F.; Vendruscolo, M.
Deposited on	2024-02-02

This is a PDB-IHM Structure Validation Report.

We welcome your comments at helpdesk@pdb-ihm.org

A user guide is available at https://pdb-ihm.org/validation_help.html with specific help available everywhere you see the ? symbol.

List of references used to build this report is available here.

1. Overview ?

1.1. Summary ?

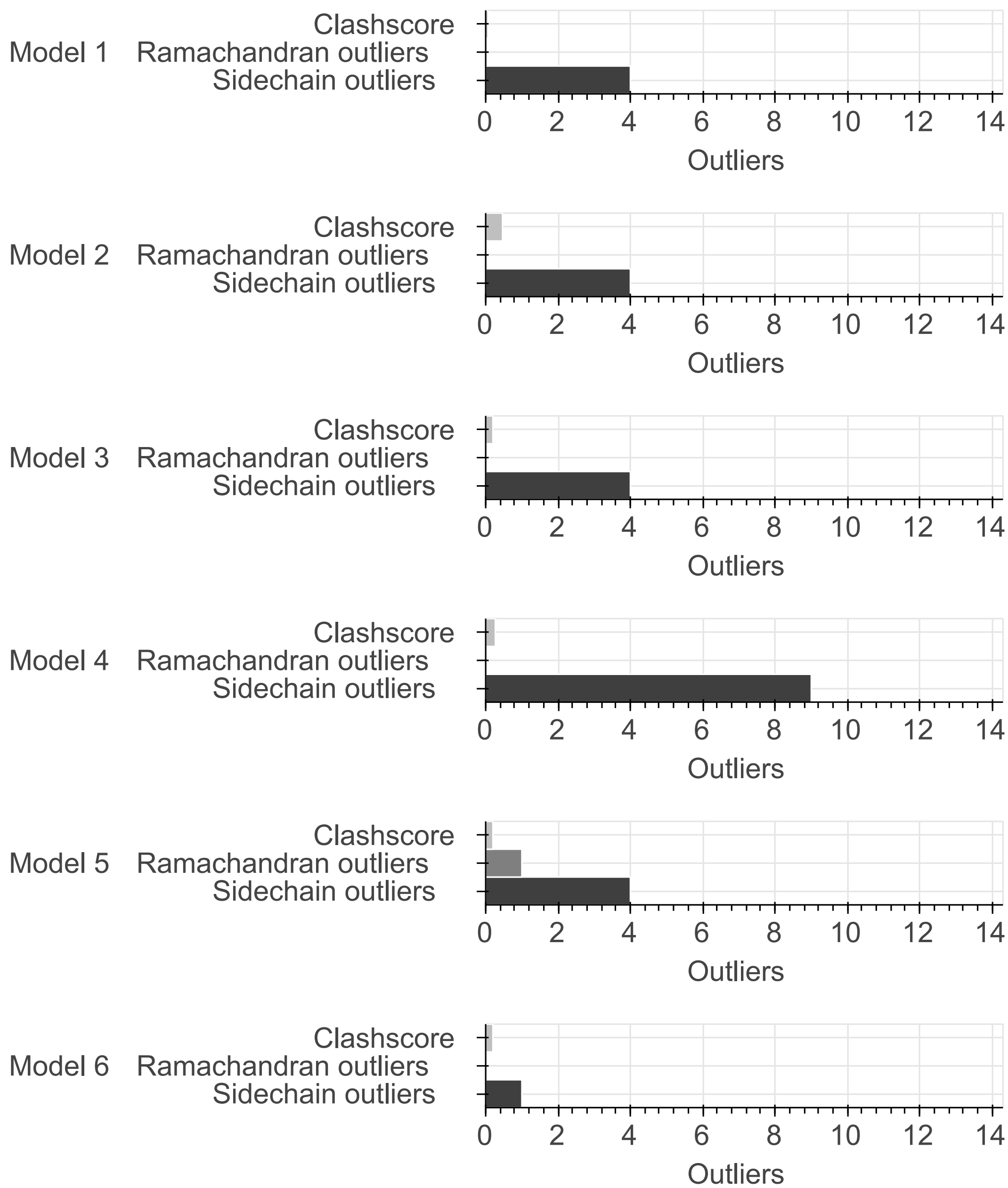
This entry consists of 10 model(s). A total of 3 dataset(s) were used to build this entry.

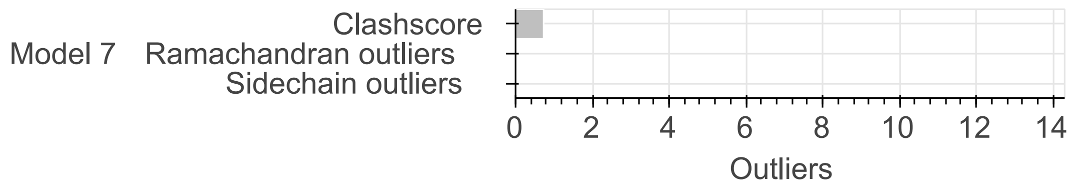
Name	Type	Count
3DEM volume	Experimental data	2
Experimental model	Starting model	1

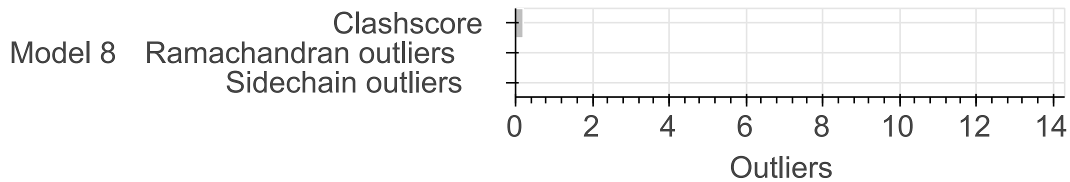
1.2. Overall quality

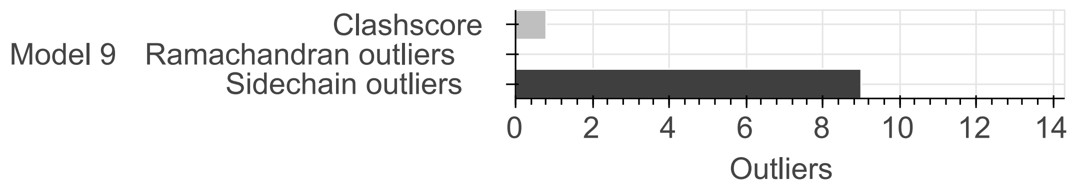
This validation report contains model quality assessments for all structures, data quality and fit to model assessments for SAS and crosslinking-MS datasets. Data quality and fit to model assessments for other datasets and model uncertainty are under development. Number of plots is limited to 256.

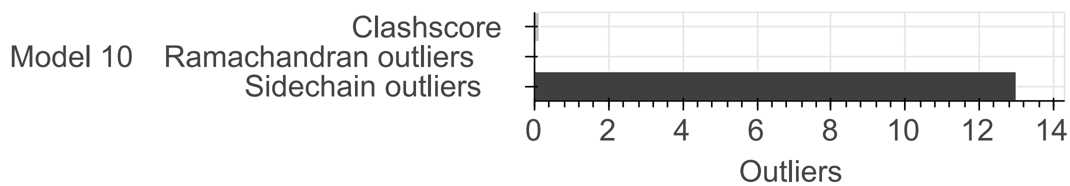
Model Quality: MolProbity Analysis



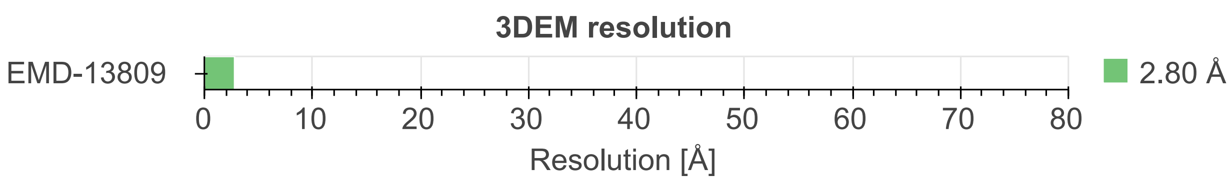




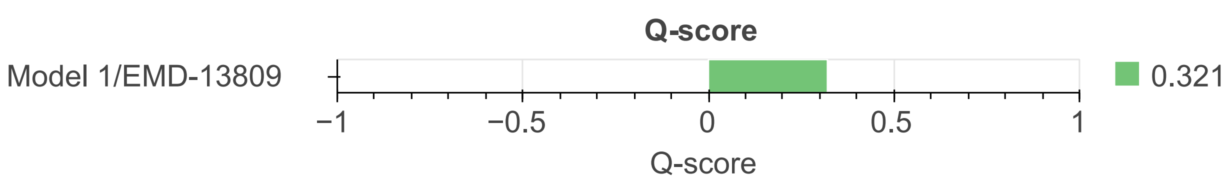




Data Quality



Fit to Data Used for Modeling



2. Model Details

2.1. Ensemble information

This entry consists of 0 distinct ensemble(s).

2.2. Representation

This entry has 1 representation(s).

ID	Model(s)	Entity ID	Molecule name	Chain(s) [auth]	Total residues	Rigid segments	Flexible segments	Model coverage/ Starting model coverage (%)	Scale
1	1-10	1	Amyloid-beta protein 42	A	42	-	1-42	100.00 / 100.00	Atomic
				B					
				C					
				D					
				E					
				F					
				G					
				H					
				I					
				J					
				K					
				L					
				M					
				N					
				O					
				P					
				Q					
				R					
				S					
				T					
				U					
				V					
				W					
				X					

2.3. Datasets used for modeling

There are 3 unique datasets used to build the models in this entry.

ID	Dataset type	Database name	Data access code
1	3DEM volume	EMDB	EMD-13809
2	Experimental model	PDB	pdb_00007q4m
5	3DEM volume	Zenodo	10.5281/zenodo.14766466

2.4. Methodology and software

This entry is a result of 1 distinct protocol(s).

Step number	Protocol ID	Method name	Method type	Method description	Number of computed models	Multi state modeling	Multi scale modeling
1	1	Not available	Not available	All the necessary input files for the ensemble generation are available at https://zenodo.org/records/14766466 in the SIMULATION zip file.	Not available	False	False

There are 3 software packages reported in this entry.

ID	Software name	Software version	Software classification	Software location
1	gmmconvert	Not available	express the experimental voxel map data as GMM data	https://gitlab.pasteur.fr/rpellari/recursive-gmconvert
2	Gromacs	GROMACS-2020.5	free and open-source software suite for high-performance molecular dynamics and output analysis	https://www.gromacs.org
3	Plumed	PLUMED.2.6.0-dev	enhanced-sampling algorithms	https://github.com/tlhr/plumed2.git

3. Data quality

3.3. 3DEM

This section describes quality of the 3DEM datasets

EMD-13809

3.3.1. Experimental information

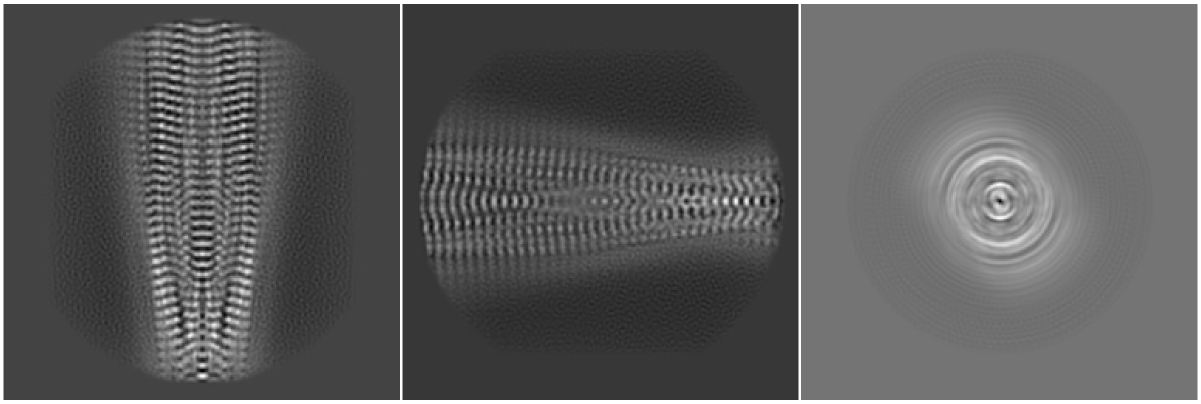
EM reconstruction method:	HELICAL
Resolution:	2.80 Å
Recommended level:	0.004
Estimated volume:	87.72 nm^3
Specimen preparation:	Preparation ID 1 Vitrification
Map-only validation report:	wwPDB validation report

3.3.2. Map visualisation

This section contains visualisations of the EMDB entry EMD-13809. 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.

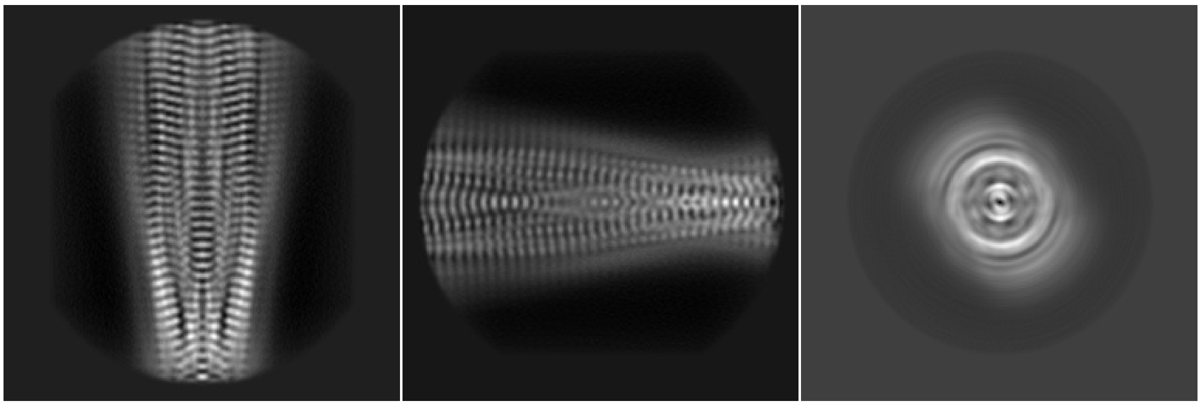
3.3.2.1. Orthogonal projections

Primary map



X **Y** **Z**

Raw map

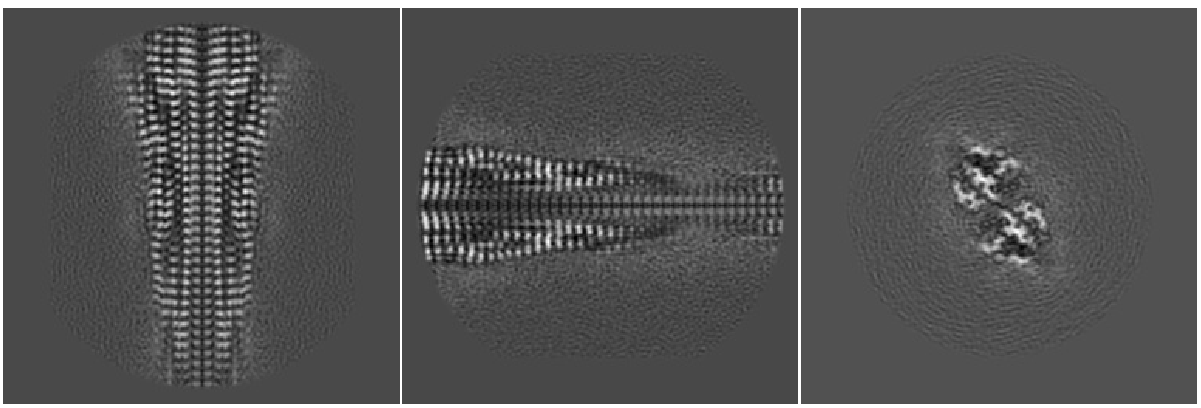


X **Y** **Z**

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

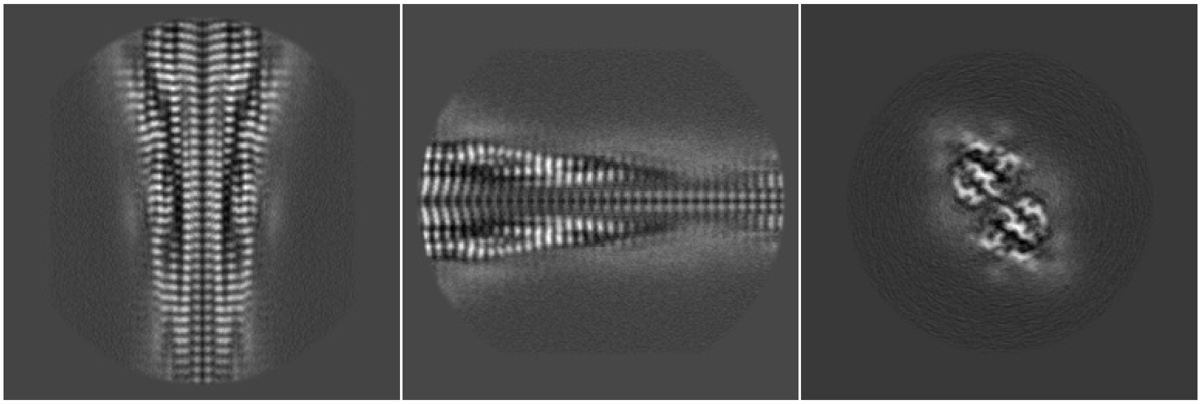
3.3.2.2. Central slices

Primary map



X Index: 128 **Y Index: 128** **Z Index: 128**

Raw map

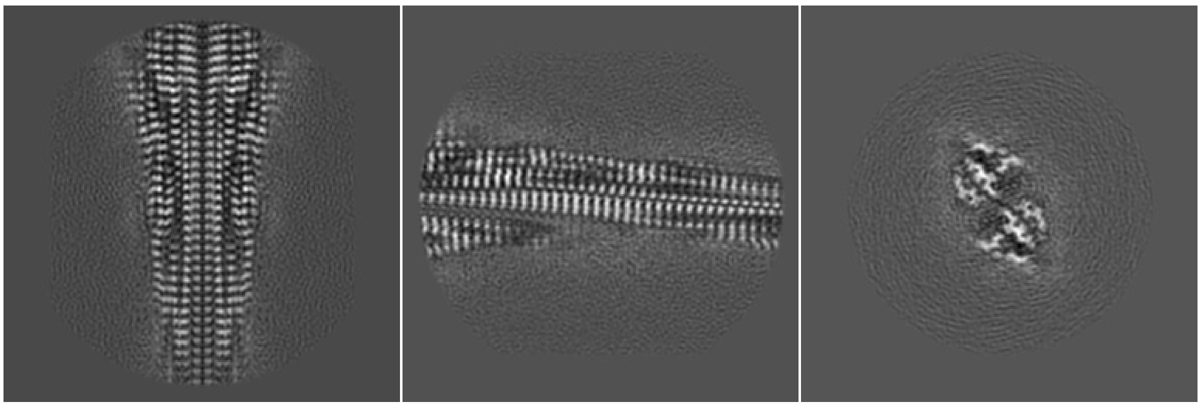


X Index: 128 **Y Index: 128** **Z Index: 128**

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

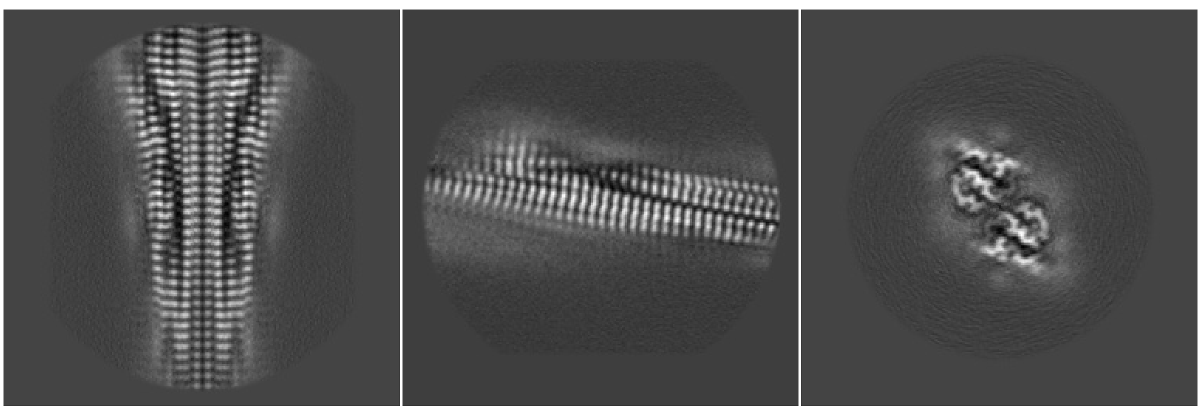
3.3.2.3. Largest variance slices

Primary map



X Index: 128 **Y Index: 118** **Z Index: 135**

Raw map

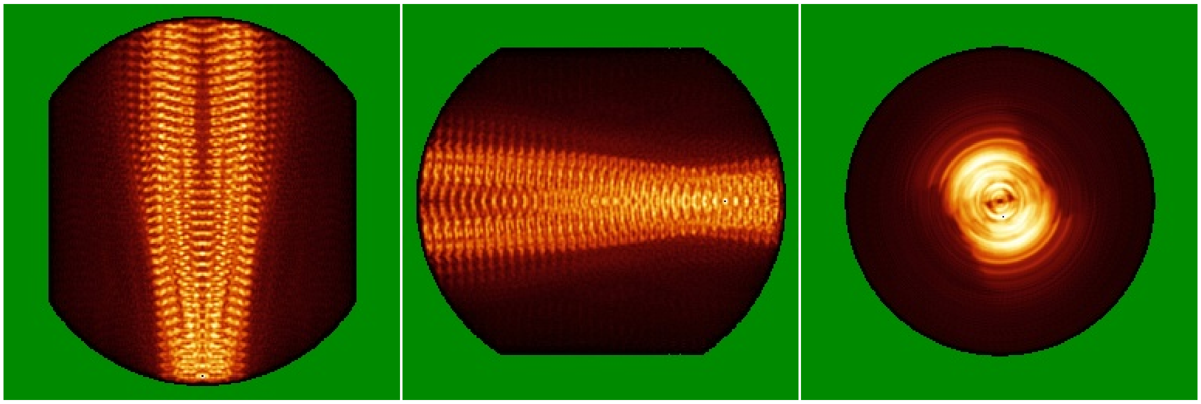


X Index: 128 **Y Index: 101** **Z Index: 122**

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

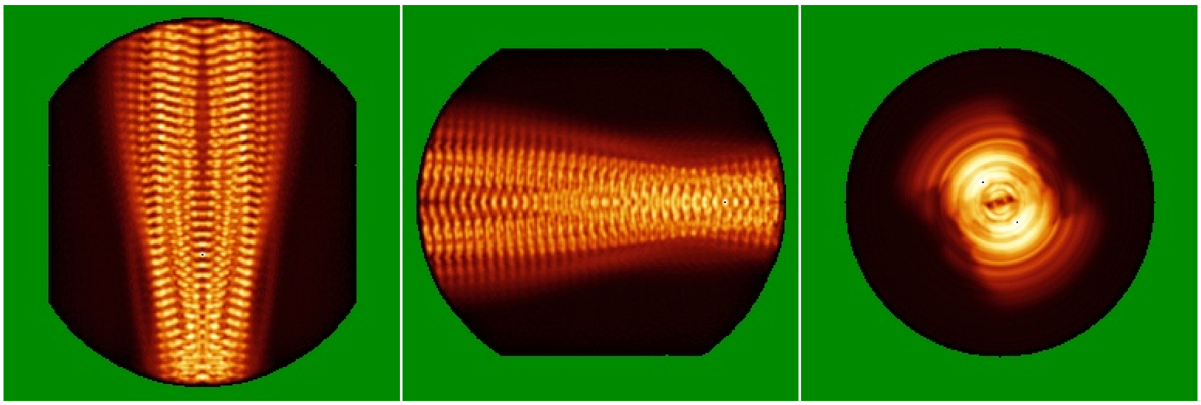
3.3.2.4 Orthogonal standard-deviation projections (false-color)

Primary map



X Y Z

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.

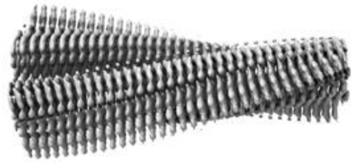
3.3.2.5. Orthogonal surface views

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.

Raw map



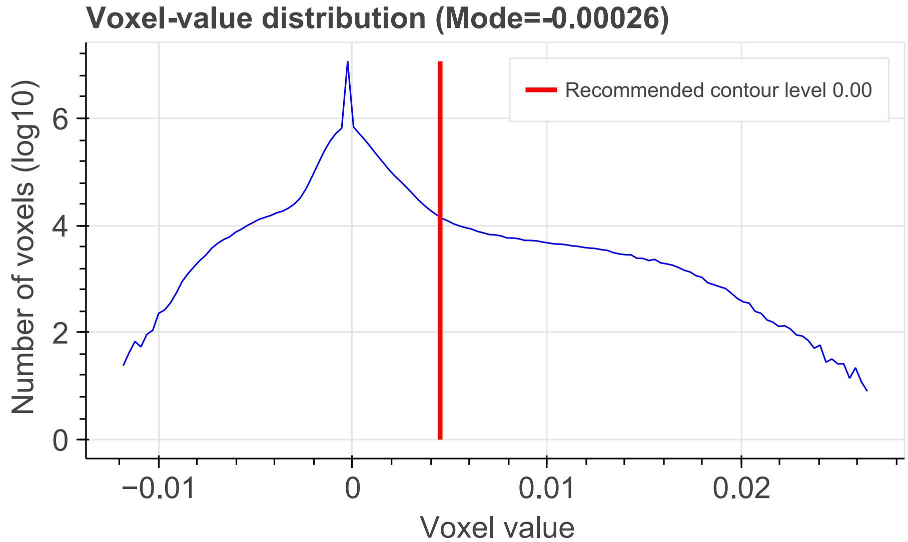
X **Y** **Z**

These images show the 3D surface of the raw map. The raw map's contour level 0.010 was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

3.3.3. Map analysis

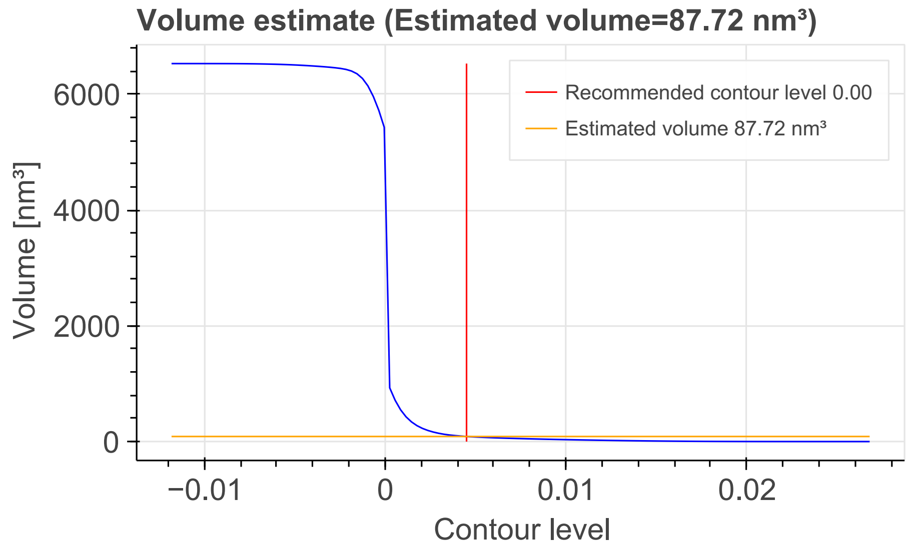
This section contains the results of statistical analysis of the map.

3.3.3.1. 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.

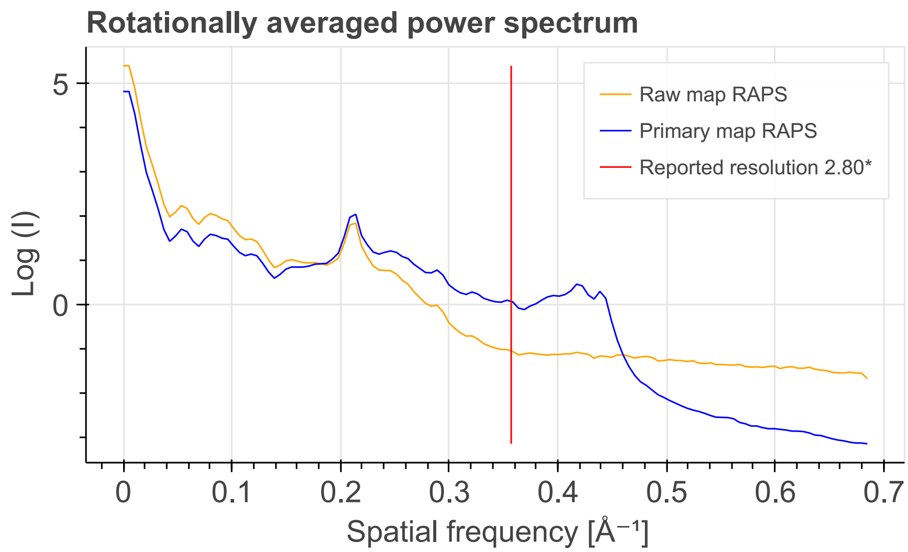
3.3.3.2. Volume estimate



The volume at the recommended contour level is 87.72 nm³.

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.

3.3.3.3. Rotationally averaged power spectrum ?

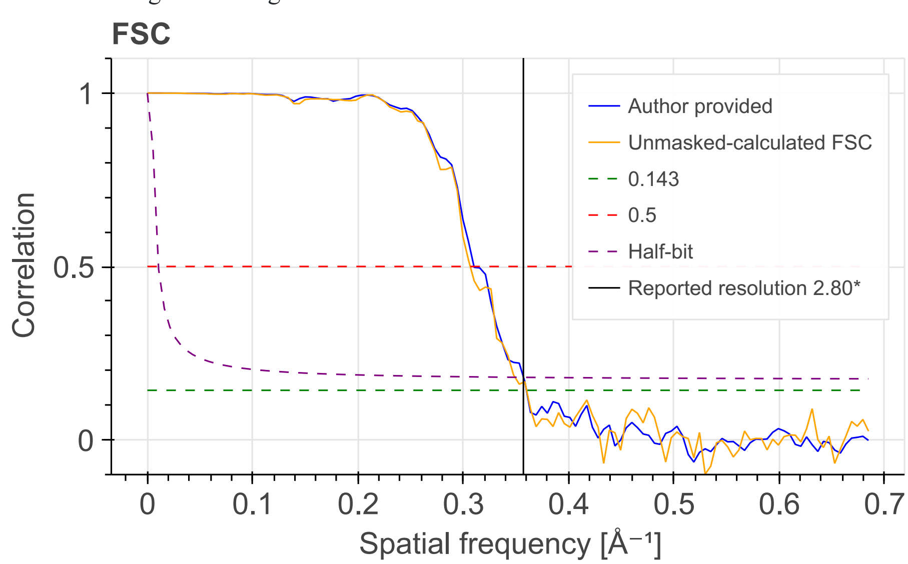


*Reported resolution corresponds to spatial frequency of 0.357 Å⁻¹

3.3.4. Fourier-Shell correlation ?

3.3.4.1. FSC ?

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.



*Reported resolution corresponds to spatial frequency of 0.357 Å⁻¹

3.3.4.2. Resolution estimates ?

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	**0.5**	**Half-bit**
Reported by author	2.80	-	-

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Author-provided FSC curve	2.78	3.22	2.80
Unmasked-calculated*	2.78	3.26	2.86

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

4. Model quality

For models with atomic structures, MolProbity analysis is performed. For models with coarse-grained or multi-scale structures, excluded volume analysis is performed.

4.1b. MolProbity Analysis

Excluded volume satisfaction for the models in the entry are listed below. The Analysed column shows the number of particle-partice or particle-atom pairs for which excluded volume was analysed.

Standard geometry: bond outliers

There are 89 bond length outliers in this entry (0.11% of 78000 assessed bonds). A summary is provided below.

Chain	Res	Type	Atoms	|Z|	Observed (Å)	Ideal (Å)	Model ID (Worst)	Models (Total)
B	24	VAL	C-O	26.41	0.70	1.23	5	2
B	24	VAL	C-N	24.85	0.98	1.33	5	2
W	15	GLN	C-O	22.31	0.78	1.23	6	1
B	11	GLU	C-O	16.05	0.91	1.23	5	1
V	12	VAL	C-O	15.96	0.91	1.23	6	1
W	15	GLN	C-N	15.46	1.11	1.33	6	1
B	11	GLU	C-N	13.53	1.14	1.33	5	1
L	24	VAL	C-O	11.96	0.99	1.23	5	1
P	24	VAL	C-O	11.93	0.99	1.23	5	2
P	24	VAL	C-N	11.16	1.17	1.33	5	2
V	40	VAL	C-O	11.01	1.01	1.23	5	1
T	20	PHE	C-O	10.83	1.01	1.23	6	1
L	24	VAL	C-N	10.61	1.18	1.33	5	1
W	16	LYS	CE-NZ	10.22	1.18	1.49	6	1
V	12	VAL	C-N	10.12	1.19	1.33	6	1
N	16	LYS	CE-NZ	9.90	1.19	1.49	6	1
D	24	VAL	C-N	8.83	1.21	1.33	9	1
V	40	VAL	C-N	8.78	1.21	1.33	5	1
D	24	VAL	C-O	8.66	1.06	1.23	9	2
D	26	SER	CB-OG	8.41	1.25	1.42	3	1

Chain	Res	Type	Atoms	|Z|	Observed (Å)	Ideal (Å)	Model ID (Worst)	Models (Total)
R	2	ALA	C-O	7.84	1.07	1.23	6	1
T	20	PHE	C-N	7.17	1.23	1.33	6	1
V	41	ILE	CG1-CD1	6.52	1.26	1.51	5	1
R	13	HIS	CG-CD2	6.32	1.42	1.35	10	1
P	9	GLY	C-O	6.19	1.11	1.23	6	1
P	24	VAL	CB-CG1	6.05	1.32	1.52	5	2
N	16	LYS	CG-CD	5.97	1.34	1.52	6	1
I	5	ARG	CZ-NH2	5.95	1.25	1.33	10	1
W	5	ARG	CD-NE	5.95	1.54	1.46	10	1
N	16	LYS	CD-CE	5.84	1.34	1.52	6	1
P	25	GLY	N-CA	5.80	1.36	1.45	5	1
D	24	VAL	CB-CG1	5.71	1.33	1.52	9	1
H	26	SER	C-N	5.71	1.41	1.33	9	1
W	29	GLY	C-N	5.70	1.41	1.33	9	1
D	10	TYR	CZ-OH	5.67	1.26	1.38	5	1
L	22	GLU	CD-OE1	5.66	1.14	1.25	1	1
C	37	GLY	CA-C	5.60	1.62	1.52	9	1
W	16	LYS	N-CA	5.45	1.35	1.46	6	1
S	41	ILE	CB-CG1	5.34	1.64	1.53	9	1
J	38	GLY	C-N	5.28	1.40	1.33	9	1
J	15	GLN	CD-OE1	5.22	1.13	1.23	4	1
W	6	HIS	CG-ND1	5.07	1.43	1.38	10	1
B	38	GLY	C-N	5.04	1.40	1.33	9	1
D	25	GLY	N-CA	5.02	1.53	1.45	10	1
I	38	GLY	N-CA	4.92	1.53	1.45	10	1
L	25	GLY	N-CA	4.91	1.37	1.45	5	1
P	4	PHE	CG-CD1	4.90	1.49	1.38	9	1
N	3	GLU	CD-OE2	4.88	1.34	1.25	9	1
H	32	ILE	CB-CG1	4.88	1.63	1.53	10	1
H	18	VAL	N-CA	4.72	1.55	1.46	9	1
P	9	GLY	C-N	4.68	1.26	1.33	6	1
G	15	GLN	CD-NE2	4.67	1.23	1.33	8	1
E	37	GLY	N-CA	4.65	1.53	1.45	9	1
B	27	ASN	CG-ND2	4.63	1.23	1.33	9	1
P	38	GLY	CA-C	4.61	1.60	1.52	9	1

Chain	Res	Type	Atoms	|Z|	Observed (Å)	Ideal (Å)	Model ID (Worst)	Models (Total)
B	1	ASP	CA-C	4.60	1.62	1.52	10	1
H	6	HIS	CE1-NE2	4.60	1.37	1.32	10	1
D	24	VAL	CB-CG2	4.58	1.37	1.52	9	1
I	24	VAL	CB-CG1	4.56	1.37	1.52	2	1
H	37	GLY	N-CA	4.51	1.52	1.45	9	2
W	5	ARG	CZ-NH2	4.42	1.27	1.33	10	1
D	6	HIS	CG-ND1	4.41	1.43	1.38	10	1
P	41	ILE	CB-CG1	4.38	1.62	1.53	10	1
B	37	GLY	C-N	4.37	1.27	1.33	9	1
K	12	VAL	CB-CG1	4.35	1.38	1.52	5	1
J	38	GLY	CA-C	4.34	1.59	1.52	9	1
N	26	SER	CB-OG	4.34	1.33	1.42	2	1
E	25	GLY	N-CA	4.33	1.52	1.45	9	1
H	40	VAL	C-N	4.33	1.39	1.33	10	1
R	13	HIS	CE1-NE2	4.31	1.36	1.32	10	1
P	36	VAL	N-CA	4.29	1.54	1.46	9	1
R	13	HIS	ND1-CE1	4.24	1.36	1.32	10	1
K	12	VAL	C-O	4.24	1.15	1.23	5	1
N	7	ASP	N-CA	4.23	1.54	1.46	9	1
H	40	VAL	N-CA	4.19	1.54	1.46	9	1
V	41	ILE	CB-CG1	4.18	1.45	1.53	5	1
U	15	GLN	C-N	4.14	1.27	1.33	1	1
E	32	ILE	CA-C	4.13	1.61	1.52	10	1
R	41	ILE	N-CA	4.13	1.54	1.46	9	1
H	6	HIS	CD2-NE2	4.07	1.33	1.37	9	1
W	6	HIS	CD2-NE2	4.05	1.33	1.37	10	1
D	6	HIS	ND1-CE1	4.04	1.36	1.32	10	1

Standard geometry: angle outliers ?

There are 805 bond angle outliers in this entry (0.77% of 104880 assessed bonds). A summary is provided below. The output is limited to 100 rows.

Chain	Res	Type	Atoms	|Z|	Observed (Å)	Ideal (Å)	Model ID (Worst)	Models (Total)
B	24	VAL	O-C-N	22.30	87.33	123.00	5	2
W	15	GLN	O-C-N	18.77	92.98	123.00	6	1
W	15	GLN	C-N-CA	16.81	151.95	121.70	6	1
B	11	GLU	O-C-N	13.30	101.72	123.00	5	1

Chain	Res	Type	Atoms	|Z|	Observed (Å)	Ideal (Å)	Model ID (Worst)	Models (Total)
W	15	GLN	CA-C-N	12.98	142.16	116.20	6	1
N	16	LYS	CG-CD-CE	11.91	138.69	111.30	6	1
B	11	GLU	C-N-CA	11.86	143.05	121.70	5	1
B	24	VAL	CA-C-N	11.78	139.76	116.20	5	2
P	24	VAL	O-C-N	11.58	104.47	123.00	5	2
B	24	VAL	C-N-CA	10.90	141.32	121.70	5	3
L	24	VAL	O-C-N	10.88	105.59	123.00	5	1
L	19	PHE	CA-CB-CG	10.85	102.95	113.80	9	2
B	11	GLU	CA-C-N	10.04	136.27	116.20	5	1
L	24	VAL	C-N-CA	9.33	138.49	121.70	5	1
N	16	LYS	CD-CE-NZ	9.11	141.04	111.90	6	1
X	14	HIS	CA-CB-CG	9.10	122.90	113.80	9	1
P	24	VAL	C-N-CA	9.05	137.99	121.70	5	2
V	12	VAL	O-C-N	8.85	108.84	123.00	6	1
J	27	ASN	OD1-CG-ND2	8.47	114.13	122.60	10	1
V	40	VAL	O-C-N	8.47	109.46	123.00	5	1
B	23	ASP	CA-CB-CG	8.30	120.90	112.60	10	4
V	41	ILE	CB-CG1-CD1	8.29	131.21	113.80	5	1
P	24	VAL	CA-C-N	8.21	132.63	116.20	5	1
V	40	VAL	C-N-CA	8.19	136.44	121.70	5	1
D	24	VAL	O-C-N	8.06	110.10	123.00	9	1
L	24	VAL	CA-C-N	7.99	132.18	116.20	5	1
J	27	ASN	CA-CB-CG	7.74	104.86	112.60	10	1
J	15	GLN	OE1-CD-NE2	7.63	114.97	122.60	4	2
D	6	HIS	CB-CG-CD2	7.48	121.47	131.20	10	5
V	12	VAL	CA-C-N	7.30	130.80	116.20	6	1
P	5	ARG	NE-CZ-NH1	7.26	128.76	121.50	9	1
W	2	ALA	C-CA-CB	7.16	121.23	110.50	10	1
R	15	GLN	OE1-CD-NE2	7.14	115.46	122.60	10	4
B	24	VAL	CA-C-O	7.12	132.91	120.80	5	1
V	40	VAL	CA-C-N	7.06	130.33	116.20	5	1
W	4	PHE	C-N-CA	6.98	134.27	121.70	6	1
S	39	VAL	CA-CB-CG1	6.94	122.19	110.40	10	1
L	5	ARG	CD-NE-CZ	6.84	133.98	124.40	9	1
N	16	LYS	CB-CG-CD	6.81	126.97	111.30	6	1

Chain	Res	Type	Atoms	|Z|	Observed (Å)	Ideal (Å)	Model ID (Worst)	Models (Total)
A	4	PHE	CA-CB-CG	6.75	120.55	113.80	10	1
P	11	GLU	CB-CG-CD	6.72	124.03	112.60	6	1
C	2	ALA	N-CA-CB	6.65	100.42	110.40	10	1
H	5	ARG	C-N-CA	6.61	133.59	121.70	9	1
A	23	ASP	CA-CB-CG	6.54	119.14	112.60	1	6
E	32	ILE	CA-CB-CG2	6.50	99.44	110.50	10	1
H	32	ILE	CA-CB-CG1	6.45	121.36	110.40	10	1
W	15	GLN	CA-CB-CG	6.44	126.97	114.10	6	1
W	27	ASN	CA-CB-CG	6.39	106.21	112.60	9	1
L	4	PHE	C-N-CA	6.37	133.17	121.70	9	1
D	24	VAL	C-N-CA	6.35	133.14	121.70	9	1
I	6	HIS	CA-CB-CG	6.34	120.14	113.80	10	1
M	15	GLN	OE1-CD-NE2	6.30	116.30	122.60	10	3
R	23	ASP	CA-CB-CG	6.29	118.89	112.60	10	1
X	14	HIS	CB-CG-CD2	6.20	123.14	131.20	9	7
I	22	GLU	N-CA-CB	6.15	100.05	110.50	1	1
G	22	GLU	C-N-CA	6.08	132.65	121.70	10	1
T	41	ILE	CA-CB-CG2	6.06	100.20	110.50	9	1
W	16	LYS	CD-CE-NZ	6.04	131.24	111.90	6	1
H	22	GLU	C-N-CA	6.03	132.55	121.70	9	2
I	6	HIS	ND1-CG-CD2	6.03	112.13	106.10	10	1
W	16	LYS	CA-CB-CG	6.02	126.14	114.10	6	1
D	1	ASP	CA-CB-CG	6.02	118.62	112.60	9	1
L	19	PHE	N-CA-CB	6.01	100.29	110.50	9	1
G	11	GLU	C-N-CA	5.97	132.45	121.70	7	1
W	6	HIS	CB-CG-CD2	5.80	123.66	131.20	9	7
G	15	GLN	OE1-CD-NE2	5.79	116.81	122.60	8	2
K	19	PHE	CA-CB-CG	5.77	119.57	113.80	1	2
X	5	ARG	NE-CZ-NH1	5.73	127.23	121.50	9	1
V	41	ILE	CA-CB-CG1	5.73	120.14	110.40	5	1
J	38	GLY	C-N-CA	5.72	131.99	121.70	9	1
B	32	ILE	C-N-CA	5.71	131.99	121.70	9	1
G	13	HIS	CA-CB-CG	5.66	119.46	113.80	5	1
I	23	ASP	CA-CB-CG	5.65	118.25	112.60	5	6
J	13	HIS	CA-CB-CG	5.65	119.45	113.80	9	2

Chain	Res	Type	Atoms	|Z|	Observed (Å)	Ideal (Å)	Model ID (Worst)	Models (Total)
R	24	VAL	CA-CB-CG1	5.62	119.96	110.40	8	1
H	23	ASP	C-N-CA	5.60	131.78	121.70	9	1
B	27	ASN	OD1-CG-ND2	5.58	117.02	122.60	9	2
N	23	ASP	CA-CB-CG	5.56	118.16	112.60	9	7
F	37	GLY	C-N-CA	5.56	131.70	121.70	9	1
E	35	MET	C-N-CA	5.56	131.70	121.70	10	1
X	28	LYS	C-N-CA	5.52	131.64	121.70	9	1
E	15	GLN	OE1-CD-NE2	5.50	117.10	122.60	3	5
S	19	PHE	CA-CB-CG	5.50	119.30	113.80	2	1
J	42	ALA	C-CA-CB	5.45	118.67	110.50	9	1
O	18	VAL	N-CA-CB	5.42	102.29	111.50	10	1
I	13	HIS	CB-CG-CD2	5.42	124.16	131.20	1	6
L	21	ALA	N-CA-CB	5.41	102.29	110.40	9	1
H	24	VAL	CA-CB-CG1	5.40	119.59	110.40	9	2
J	6	HIS	CB-CG-CD2	5.40	124.19	131.20	1	8
P	3	GLU	N-CA-CB	5.39	101.33	110.50	9	1
H	23	ASP	CA-CB-CG	5.38	117.98	112.60	7	5
D	24	VAL	CA-C-N	5.36	126.93	116.20	9	1
P	16	LYS	CB-CG-CD	5.32	123.54	111.30	4	1
J	13	HIS	CB-CG-CD2	5.32	124.29	131.20	8	7
D	39	VAL	C-N-CA	5.31	131.26	121.70	9	1
D	19	PHE	CA-CB-CG	5.30	119.10	113.80	10	1
E	30	ALA	CA-C-O	5.29	111.80	120.80	10	1
M	19	PHE	CA-CB-CG	5.29	108.51	113.80	10	1
H	6	HIS	CB-CG-CD2	5.27	124.35	131.20	9	6
D	6	HIS	CB-CG-ND1	5.27	130.60	122.70	10	1

Too-close contacts ?

The following all-atom clashscore is based on a MolProbity analysis. All-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The table below contains clashscores for all atomic models in this entry.

Model ID	Clash score	Number of clashes
1	0.07	1
2	0.47	7
3	0.20	3
4	0.27	4
5	0.20	3

Model ID	Clash score	Number of clashes
6	0.20	3
7	0.73	11
8	0.20	3
9	0.80	12
10	0.13	2

There are 49 clashes. The table below contains the detailed list of all clashes based on a MolProbity analysis. Bad clashes are >= 0.4 Angstrom.

Atom 1	Atom 2	Clash(Å)	Model ID (Worst)	Models (Total)
L:22:GLU:OE2	R:22:GLU:N	0.96	7	1
L:22:GLU:OE1	R:24:VAL:HG22	0.90	7	1
V:14:HIS:CE1	V:17:LEU:HD13	0.83	9	1
V:14:HIS:CE1	X:14:HIS:CB	0.74	9	1
Q:35:MET:HB3	S:35:MET:SD	0.72	7	1
V:14:HIS:CE1	X:14:HIS:HB2	0.72	9	1
S:18:VAL:O	S:18:VAL:HG12	0.71	8	1
K:34:LEU:HD23	Q:34:LEU:HB3	0.71	2	1
L:22:GLU:OE2	R:21:ALA:C	0.70	7	1
G:22:GLU:O	G:23:ASP:OD1	0.69	5	1
L:22:GLU:OE1	R:24:VAL:HG13	0.68	7	1
L:22:GLU:OE1	R:24:VAL:CG2	0.65	7	1
V:34:LEU:HG	V:35:MET:HG2	0.62	3	1
J:36:VAL:O	J:36:VAL:HG12	0.61	9	1
S:32:ILE:CG2	S:35:MET:SD	0.59	7	1
K:34:LEU:CD2	Q:34:LEU:HB3	0.57	2	1
V:14:HIS:ND1	X:14:HIS:HB2	0.54	9	1
G:12:VAL:HG22	G:13:HIS:H	0.53	4	1
J:36:VAL:CG1	J:36:VAL:O	0.52	9	1
L:22:GLU:OE1	R:24:VAL:CG1	0.51	7	1
S:32:ILE:HG22	S:35:MET:SD	0.51	7	1
V:35:MET:SD	X:36:VAL:HB	0.49	3	1
V:14:HIS:CE1	X:14:HIS:CD2	0.49	9	1
P:6:HIS:CG	P:7:ASP:H	0.49	6	1
S:16:LYS:HE2	S:19:PHE:CD1	0.48	6	1
L:19:PHE:CD1	R:19:PHE:CE2	0.48	9	1
S:16:LYS:HE2	S:19:PHE:CG	0.47	5	2

Atom 1	Atom 2	Clash(Å)	Model ID (Worst)	Models (Total)
V:14:HIS:CE1	X:14:HIS:CG	0.47	9	1
S:32:ILE:HG21	S:35:MET:HE2	0.46	7	1
G:5:ARG:HG3	G:36:VAL:HG12	0.46	8	1
K:17:LEU:CD1	K:34:LEU:HG	0.46	2	1
S:18:VAL:CG1	S:18:VAL:O	0.45	8	1
G:22:GLU:O	G:23:ASP:CG	0.43	5	1
K:17:LEU:CD1	K:34:LEU:CD2	0.43	2	1
K:17:LEU:HD13	K:34:LEU:CD2	0.43	2	1
W:28:LYS:HA	W:28:LYS:HE2	0.43	4	1
B:18:VAL:HG12	B:20:PHE:CE1	0.42	10	1
K:17:LEU:CD1	K:34:LEU:HD21	0.42	2	1
V:14:HIS:CE1	X:14:HIS:HB3	0.42	9	1
G:22:GLU:HG2	G:23:ASP:H	0.42	3	1
J:42:ALA:HB3	P:42:ALA:HA	0.42	9	1
S:32:ILE:CG2	S:35:MET:CG	0.42	7	1
U:19:PHE:CD1	W:16:LYS:HE2	0.41	4	1
V:14:HIS:ND1	X:14:HIS:CB	0.41	9	1
N:22:GLU:HG2	N:23:ASP:H	0.41	2	1
H:10:TYR:H	H:13:HIS:CE1	0.41	10	1
O:16:LYS:HE3	O:19:PHE:CE2	0.41	1	1
A:34:LEU:HB3	C:34:LEU:HD23	0.40	4	1

Torsion angles: Protein backbone ?

In the following table, Ramachandran outliers are listed. The Analysed column shows the number of residues for which the backbone conformation was analysed.

Model ID	Analysed	Favored	Allowed	Outliers
1	960	847	113	0
2	960	863	97	0
3	960	862	98	0
4	960	865	95	0
5	960	856	103	1
6	960	844	116	0
7	960	858	102	0
8	960	855	105	0
9	960	855	105	0
10	960	841	119	0

There are 1 unique backbone outliers. Detailed list of outliers are tabulated below.

Chain	Res	Type	Models (Total)
O	9	GLY	1

Torsion angles : Protein sidechains

In the following table, sidechain rotameric outliers are listed. The Analysed column shows the number of residues for which the sidechain conformation was analysed.

Model ID	Analysed	Favored	Allowed	Outliers
1	768	737	27	4
2	768	740	24	4
3	768	737	27	4
4	768	731	28	9
5	768	736	28	4
6	768	742	25	1
7	768	753	15	0
8	768	757	11	0
9	768	728	31	9
10	768	714	41	13

There are 43 unique sidechain outliers. Detailed list of outliers are tabulated below.

Chain	Res	Type	Models (Total)
J	34	LEU	2
L	34	LEU	2
S	31	ILE	2
V	41	ILE	2
X	34	LEU	2
A	32	ILE	1
A	36	VAL	1
B	3	GLU	1
B	10	TYR	1
B	11	GLU	1
B	34	LEU	1
E	34	LEU	1
E	36	VAL	1
F	16	LYS	1
G	34	LEU	1
H	12	VAL	1

Chain	Res	Type	Models (Total)
H	13	HIS	1
I	3	GLU	1
I	34	LEU	1
J	26	SER	1
K	34	LEU	1
L	5	ARG	1
L	11	GLU	1
M	3	GLU	1
M	16	LYS	1
M	41	ILE	1
N	3	GLU	1
N	16	LYS	1
O	5	ARG	1
O	10	TYR	1
O	11	GLU	1
O	15	GLN	1
R	34	LEU	1
S	5	ARG	1
S	10	TYR	1
S	15	GLN	1
S	22	GLU	1
S	41	ILE	1
T	13	HIS	1
W	3	GLU	1
W	36	VAL	1
X	35	MET	1
X	41	ILE	1

5. Fit to Data Used for Modeling Assessment

5.3. 3DEM

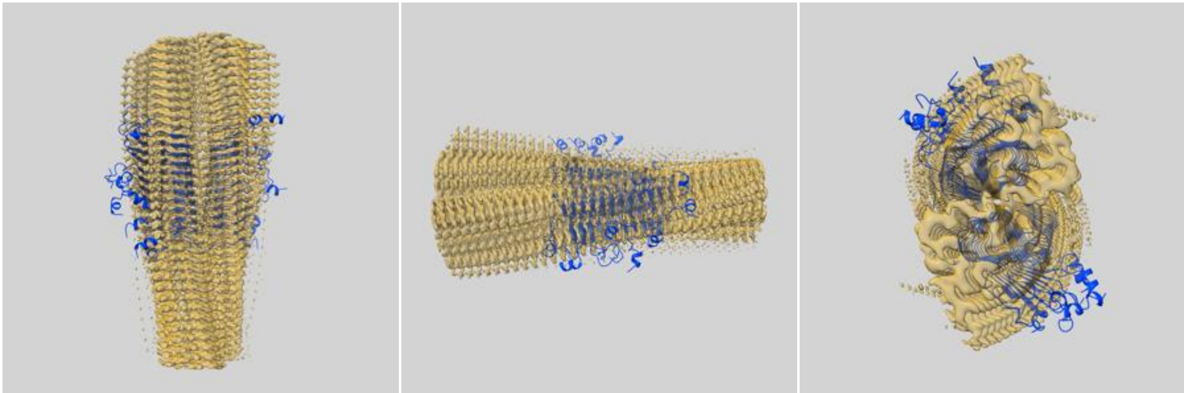
This section describes fit of models to the 3DEM data. Only results for the representative model, selected as a first model with the largest number of asymmetric units.

EMD-13809

5.3.1. Map-model fit ?

Only results for the representative Model 1 are shown.

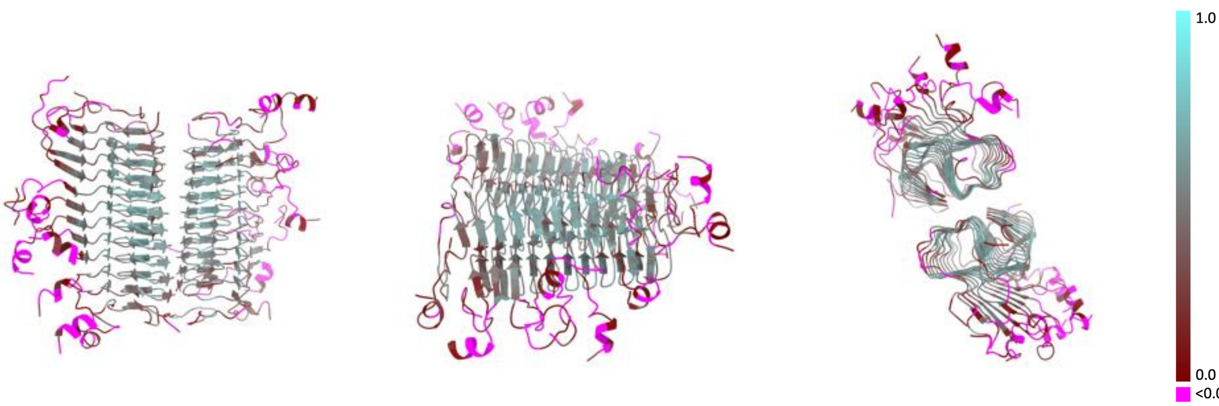
5.3.1.1 Map-model overlay ?



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 colored in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

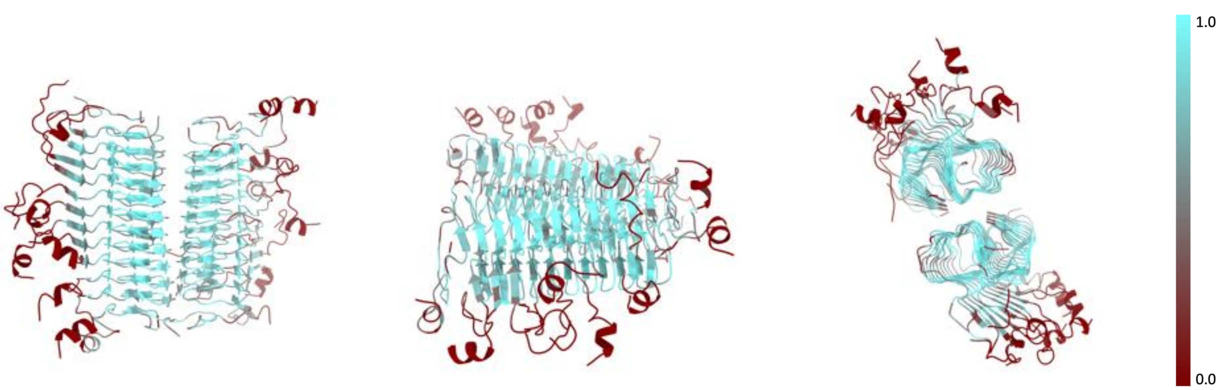
5.3.1.2. Q-score mapped to coordinate model ?



X **Y** **Z**

The images above show the model with each residue colored according to 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.

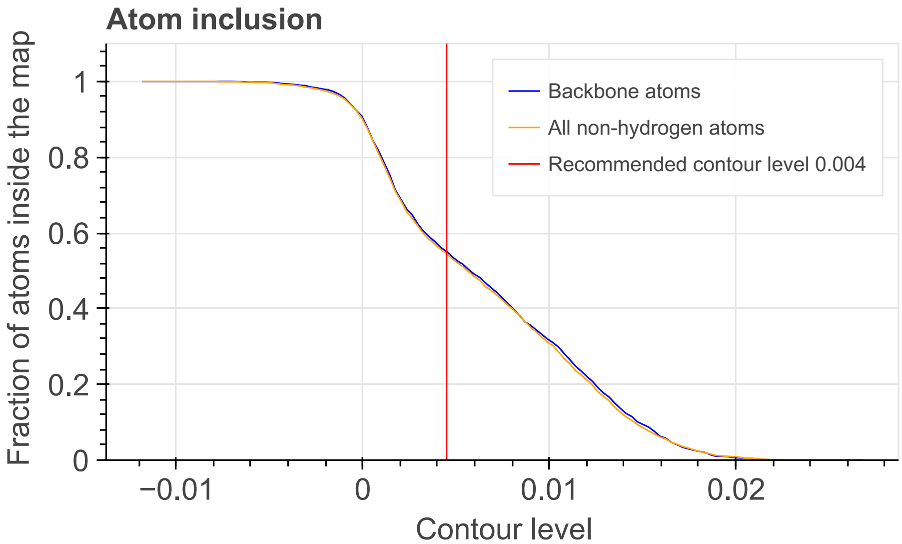
5.3.1.3. Atom inclusion mapped to coordinate model ?



X **Y** **Z**

The images above show the model with each residue colored according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level 0.004 .

5.3.1.4. Atom inclusion



At the recommended contour level, 55% of all backbone atoms, 55% of all non-hydrogen atoms, are inside the map.

5.3.1.5. Map-model fit summary

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	0.545	0.321
A	0.547	0.361
B	0.557	0.356
C	0.570	0.363
D	0.557	0.356
E	0.554	0.329
F	0.541	0.338
G	0.573	0.344
H	0.570	0.372
I	0.563	0.371
J	0.573	0.364
K	0.551	0.326
L	0.567	0.347
M	0.592	0.376
N	0.573	0.374
O	0.567	0.353
P	0.579	0.370
Q	0.541	0.279
R	0.668	0.343
S	0.487	0.170

1.0
0.0
<0.0

Chain	Atom inclusion	Q-score
T	0.532	0.220
U	0.516	0.244
V	0.544	0.227
W	0.516	0.263
X	0.528	0.267

6. Fit to Data Used for Validation Assessment

Validation for this section is under development.

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