



Full wwPDB EM Map/Model Validation Report ⓘ

Jun 6, 2020 – 07:09 am BST

PDB ID : 6VGN
EMDB ID : EMD-21198
Title : ClpP1P2 complex from *M. tuberculosis* bound to ADEP
Authors : Ripstein, Z.A.; Vahidi, S.; Rubinstein, J.L.; Kay, L.E.
Deposited on : 2020-01-08
Resolution : 3.10 Å (reported)
Based on initial model : 5DZK

This is a Full wwPDB EM Map/Model 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 following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

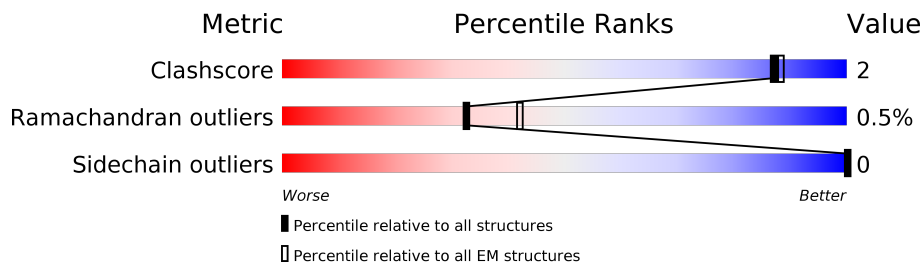
EMDB validation analysis : 0.0.0.dev33
Mogul : 1.8.5 (274361), CSD as541be (2020)
MolProbity : 4.02b-467
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.11

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 3.10 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	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

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 on 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	200	 15% 93% 5%
1	B	200	 15% 93% 6%
1	C	200	 16% 94%
1	D	200	 18% 94% 5%
1	E	200	 17% 93% 6%
1	F	200	 16% 93% 5%
1	G	200	 17% 93% 5%
2	H	194	 7% 86% 6% 8%

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Mol	Chain	Length	Quality of chain
2	I	194	
2	J	194	
2	K	194	
2	L	194	
2	M	194	
2	N	194	
3	V	7	
3	W	7	
3	X	7	
3	Y	7	
3	Z	7	
3	a	7	
3	b	7	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	MP8	V	7	X	-	-	-
3	MP8	W	7	X	-	-	-
3	MP8	X	7	X	-	-	-
3	MP8	Y	7	X	-	-	-
3	MP8	Z	7	X	-	-	-
3	MP8	a	7	X	-	-	-
3	MP8	b	7	X	-	-	-

2 Entry composition i

There are 3 unique types of molecules in this entry. The entry contains 20447 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called ATP-dependent Clp protease proteolytic subunit.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	196	1508	948	257	295	8	0	0
1	B	196	1508	948	257	295	8	0	0
1	C	196	1508	948	257	295	8	0	0
1	D	196	1508	948	257	295	8	0	0
1	E	196	1508	948	257	295	8	0	0
1	F	196	1508	948	257	295	8	0	0
1	G	196	1508	948	257	295	8	0	0

- Molecule 2 is a protein called ATP-dependent Clp protease proteolytic subunit 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	H	178	1357	858	229	261	9	0	0
2	I	178	1357	858	229	261	9	0	0
2	J	178	1357	858	229	261	9	0	0
2	K	178	1357	858	229	261	9	0	0
2	L	178	1357	858	229	261	9	0	0
2	M	178	1357	858	229	261	9	0	0
2	N	178	1357	858	229	261	9	0	0

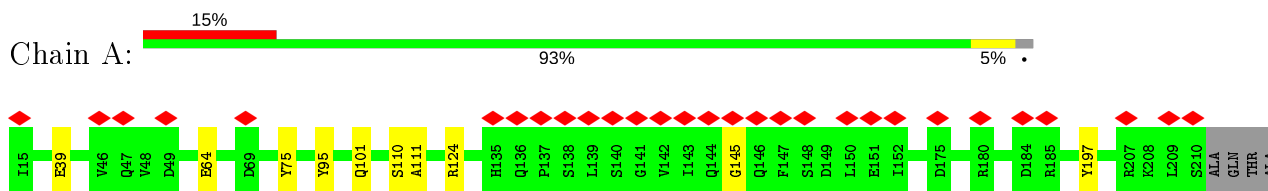
- Molecule 3 is a protein called R0M-WFP-ALO-PRO-YCP-ALA-MP8.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	V	7	Total 56	C 40	F 2	N 6	O 8	0	0
3	W	7	Total 56	C 40	F 2	N 6	O 8	0	0
3	X	7	Total 56	C 40	F 2	N 6	O 8	0	0
3	Y	7	Total 56	C 40	F 2	N 6	O 8	0	0
3	Z	7	Total 56	C 40	F 2	N 6	O 8	0	0
3	a	7	Total 56	C 40	F 2	N 6	O 8	0	0
3	b	7	Total 56	C 40	F 2	N 6	O 8	0	0

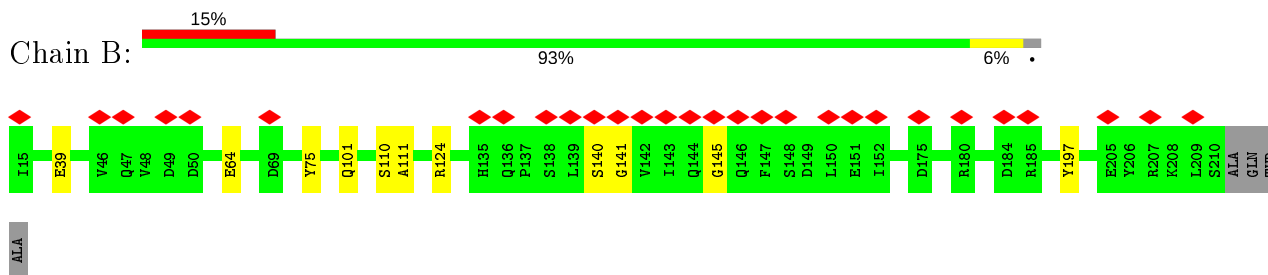
3 Residue-property plots [i](#)

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

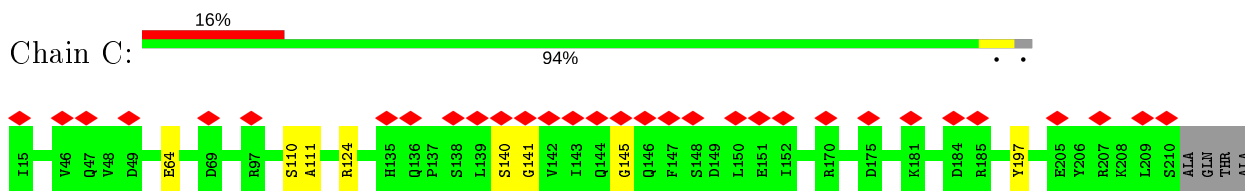
- Molecule 1: ATP-dependent Clp protease proteolytic subunit



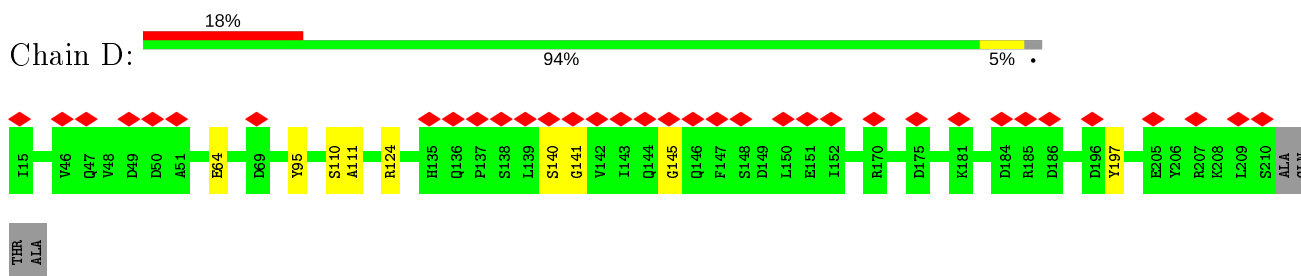
- Molecule 1: ATP-dependent Clp protease proteolytic subunit



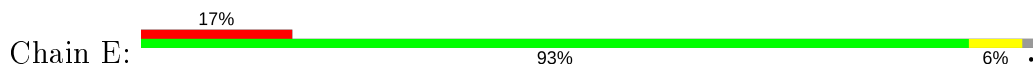
- Molecule 1: ATP-dependent Clp protease proteolytic subunit

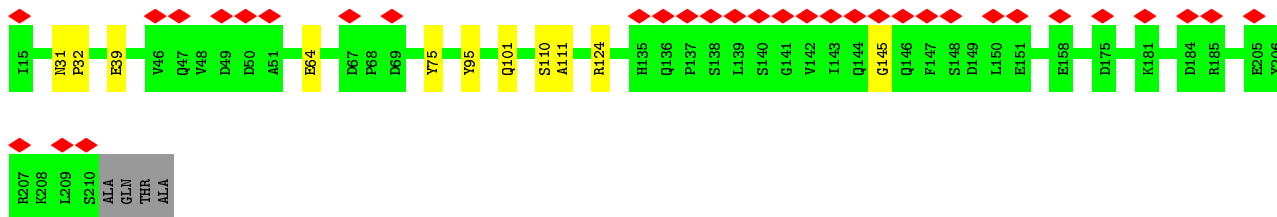


- Molecule 1: ATP-dependent Clp protease proteolytic subunit

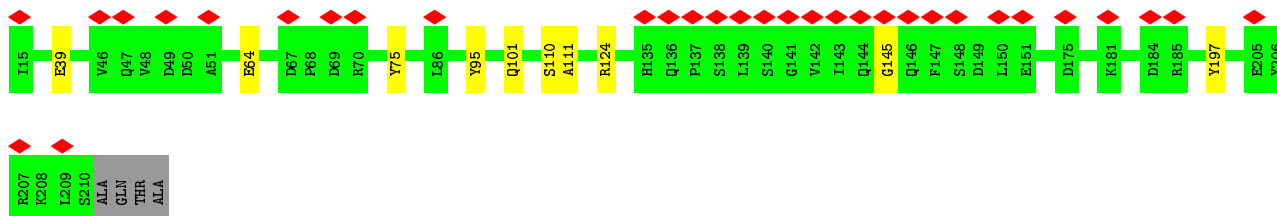


- Molecule 1: ATP-dependent Clp protease proteolytic subunit

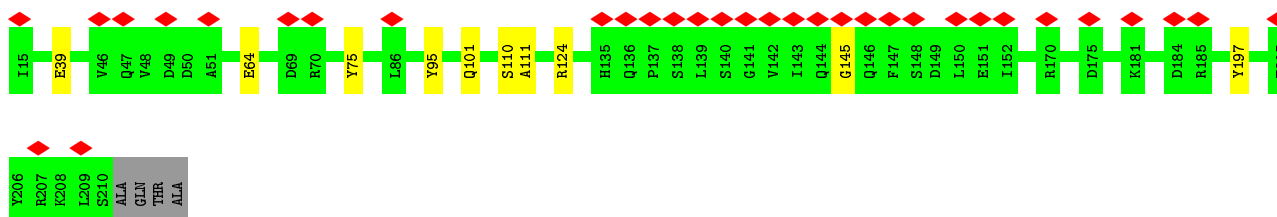




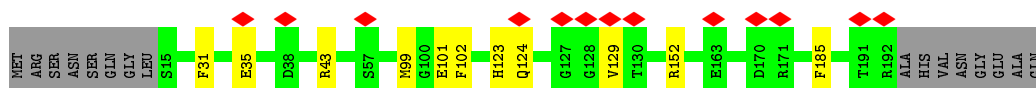
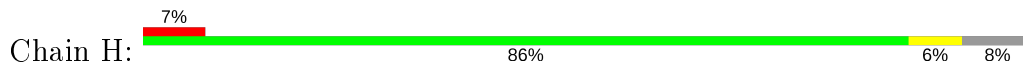
- Molecule 1: ATP-dependent Clp protease proteolytic subunit



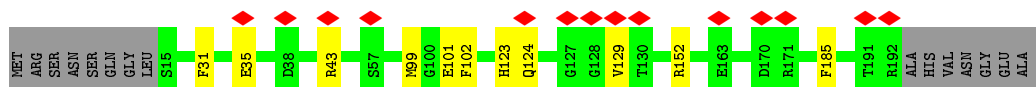
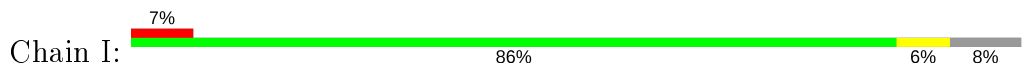
- Molecule 1: ATP-dependent Clp protease proteolytic subunit



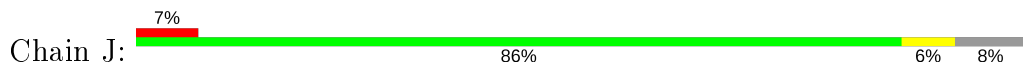
- Molecule 2: ATP-dependent Clp protease proteolytic subunit 1

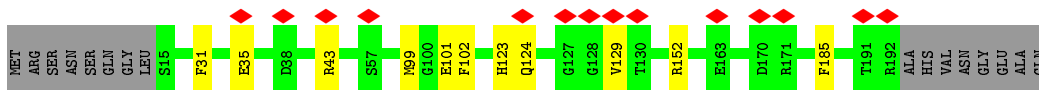


- Molecule 2: ATP-dependent Clp protease proteolytic subunit 1

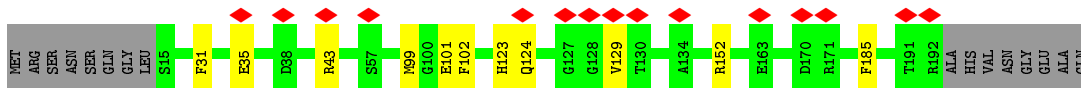
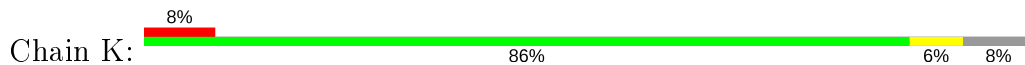


- Molecule 2: ATP-dependent Clp protease proteolytic subunit 1

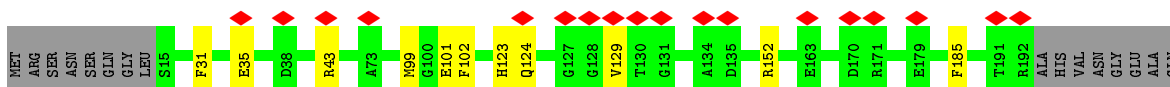
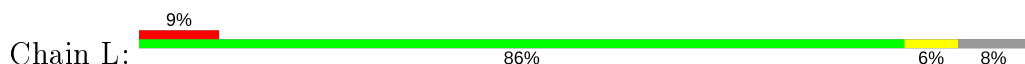




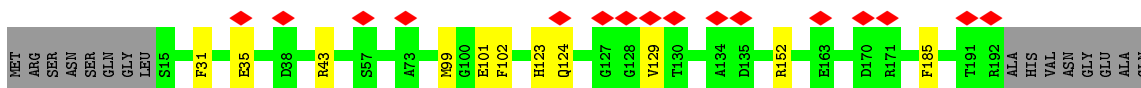
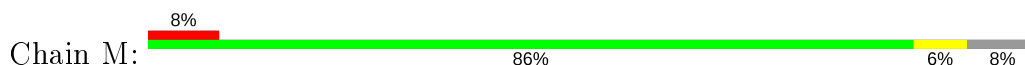
- Molecule 2: ATP-dependent Clp protease proteolytic subunit 1



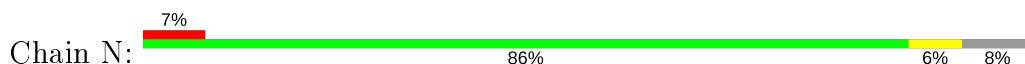
- Molecule 2: ATP-dependent Clp protease proteolytic subunit 1



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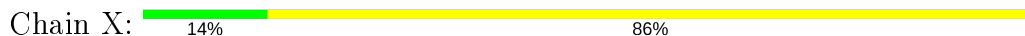
- Molecule 3: R0M-WFP-ALO-PRO-YCP-ALA-MP8



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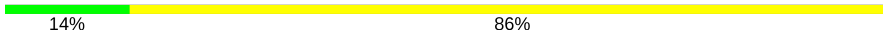


- Molecule 3: R0M-WFP-ALO-PRO-YCP-ALA-MP8



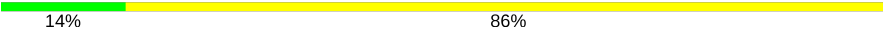
P1	P2	P3	P4	P5	A6	P7
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- Molecule 3: R0M-WFP-ALO-PRO-YCP-ALA-MP8

Chain Y:  14% 86%

P1	P2	P3	P4	P5	A6	P7
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- Molecule 3: R0M-WFP-ALO-PRO-YCP-ALA-MP8

Chain Z:  14% 86%

P1	P2	P3	P4	P5	A6	P7
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- Molecule 3: R0M-WFP-ALO-PRO-YCP-ALA-MP8

Chain a:  100%

There are no outlier residues recorded for this chain.

- Molecule 3: R0M-WFP-ALO-PRO-YCP-ALA-MP8

Chain b:  100%

There are no outlier residues recorded for this chain.

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C7	Depositor
Number of particles used	192430	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	43	Depositor
Minimum defocus (nm)	700	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	75000	Depositor
Image detector	FEI FALCON III (4k x 4k)	Depositor
Maximum map value	6.396	Depositor
Minimum map value	-4.110	Depositor
Average map value	0.014	Depositor
Map value standard deviation	0.360	Depositor
Recommended contour level	1.3	Depositor
Map size (\AA)	195.04, 195.04, 195.04	Depositor
Map dimensions	184, 184, 184	Depositor
Map angles ($^\circ$)	90.0, 90.0, 90.0	Depositor
Pixel spacing (\AA)	1.06, 1.06, 1.06	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: ALO, WFP, YCP, ROM, MP8

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	1.04	1/1529 (0.1%)	0.92	2/2068 (0.1%)
1	B	1.04	1/1529 (0.1%)	0.92	2/2068 (0.1%)
1	C	1.04	1/1529 (0.1%)	0.92	2/2068 (0.1%)
1	D	1.04	1/1529 (0.1%)	0.92	2/2068 (0.1%)
1	E	1.04	1/1529 (0.1%)	0.92	1/2068 (0.0%)
1	F	1.04	1/1529 (0.1%)	0.92	2/2068 (0.1%)
1	G	1.04	1/1529 (0.1%)	0.92	2/2068 (0.1%)
2	H	1.16	5/1379 (0.4%)	0.91	3/1864 (0.2%)
2	I	1.16	5/1379 (0.4%)	0.91	3/1864 (0.2%)
2	J	1.16	5/1379 (0.4%)	0.91	3/1864 (0.2%)
2	K	1.16	5/1379 (0.4%)	0.91	3/1864 (0.2%)
2	L	1.16	5/1379 (0.4%)	0.91	3/1864 (0.2%)
2	M	1.16	5/1379 (0.4%)	0.91	3/1864 (0.2%)
2	N	1.16	5/1379 (0.4%)	0.91	3/1864 (0.2%)
3	V	0.66	0/11	1.06	0/12
3	W	0.66	0/11	1.06	0/12
3	X	0.67	0/11	1.06	0/12
3	Y	0.66	0/11	1.05	0/12
3	Z	0.66	0/11	1.06	0/12
3	a	0.66	0/11	1.06	0/12
3	b	0.67	0/11	1.05	0/12
All	All	1.10	42/20433 (0.2%)	0.92	34/27608 (0.1%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
3	V	1	0
3	W	1	0

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Mol	Chain	#Chirality outliers	#Planarity outliers
3	X	1	0
3	Y	1	0
3	Z	1	0
3	a	1	0
3	b	1	0
All	All	7	0

All (42) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	J	101	GLU	CD-OE2	-6.08	1.19	1.25
2	L	101	GLU	CD-OE2	-6.08	1.19	1.25
2	N	101	GLU	CD-OE2	-6.06	1.19	1.25
2	I	101	GLU	CD-OE2	-6.03	1.19	1.25
2	M	101	GLU	CD-OE2	-6.03	1.19	1.25
2	H	101	GLU	CD-OE2	-6.01	1.19	1.25
2	K	101	GLU	CD-OE2	-6.00	1.19	1.25
2	I	129	VAL	CB-CG2	-5.90	1.40	1.52
2	H	129	VAL	CB-CG2	-5.89	1.40	1.52
2	J	129	VAL	CB-CG2	-5.89	1.40	1.52
2	K	129	VAL	CB-CG2	-5.89	1.40	1.52
2	N	129	VAL	CB-CG2	-5.87	1.40	1.52
2	M	129	VAL	CB-CG2	-5.87	1.40	1.52
2	L	129	VAL	CB-CG2	-5.85	1.40	1.52
1	C	64	GLU	CD-OE1	-5.61	1.19	1.25
1	B	64	GLU	CD-OE1	-5.61	1.19	1.25
1	E	64	GLU	CD-OE1	-5.59	1.19	1.25
1	G	64	GLU	CD-OE1	-5.59	1.19	1.25
1	D	64	GLU	CD-OE1	-5.58	1.19	1.25
1	F	64	GLU	CD-OE1	-5.56	1.19	1.25
1	A	64	GLU	CD-OE1	-5.54	1.19	1.25
2	J	31	PHE	CB-CG	-5.48	1.42	1.51
2	M	31	PHE	CB-CG	-5.47	1.42	1.51
2	H	31	PHE	CB-CG	-5.47	1.42	1.51
2	N	31	PHE	CB-CG	-5.46	1.42	1.51
2	K	31	PHE	CB-CG	-5.45	1.42	1.51
2	I	31	PHE	CB-CG	-5.44	1.42	1.51
2	L	31	PHE	CB-CG	-5.44	1.42	1.51
2	M	102	PHE	CB-CG	-5.24	1.42	1.51
2	I	102	PHE	CB-CG	-5.22	1.42	1.51
2	J	102	PHE	CB-CG	-5.20	1.42	1.51
2	H	102	PHE	CB-CG	-5.19	1.42	1.51

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	N	102	PHE	CB-CG	-5.19	1.42	1.51
2	K	102	PHE	CB-CG	-5.18	1.42	1.51
2	L	102	PHE	CB-CG	-5.18	1.42	1.51
2	K	185	PHE	CB-CG	-5.06	1.42	1.51
2	H	185	PHE	CB-CG	-5.04	1.42	1.51
2	M	185	PHE	CB-CG	-5.03	1.42	1.51
2	N	185	PHE	CB-CG	-5.01	1.42	1.51
2	L	185	PHE	CB-CG	-5.01	1.42	1.51
2	I	185	PHE	CB-CG	-5.01	1.42	1.51
2	J	185	PHE	CB-CG	-5.00	1.42	1.51

All (34) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	N	99	MET	CG-SD-CE	7.37	112.00	100.20
2	I	99	MET	CG-SD-CE	7.37	111.99	100.20
1	G	124	ARG	NE-CZ-NH1	7.36	123.98	120.30
1	D	124	ARG	NE-CZ-NH1	7.36	123.98	120.30
2	J	99	MET	CG-SD-CE	7.36	111.97	100.20
2	K	99	MET	CG-SD-CE	7.35	111.95	100.20
2	H	99	MET	CG-SD-CE	7.34	111.95	100.20
2	M	99	MET	CG-SD-CE	7.34	111.94	100.20
1	F	124	ARG	NE-CZ-NH1	7.33	123.96	120.30
2	L	99	MET	CG-SD-CE	7.32	111.91	100.20
1	E	124	ARG	NE-CZ-NH1	7.31	123.95	120.30
1	B	124	ARG	NE-CZ-NH1	7.28	123.94	120.30
1	A	124	ARG	NE-CZ-NH1	7.24	123.92	120.30
1	C	124	ARG	NE-CZ-NH1	7.21	123.90	120.30
2	N	152	ARG	NE-CZ-NH2	-6.37	117.11	120.30
2	M	152	ARG	NE-CZ-NH2	-6.32	117.14	120.30
2	J	152	ARG	NE-CZ-NH2	-6.32	117.14	120.30
2	K	152	ARG	NE-CZ-NH2	-6.29	117.15	120.30
2	L	152	ARG	NE-CZ-NH2	-6.27	117.16	120.30
2	M	43	ARG	NE-CZ-NH2	-6.26	117.17	120.30
2	J	43	ARG	NE-CZ-NH2	-6.23	117.19	120.30
2	L	43	ARG	NE-CZ-NH2	-6.23	117.19	120.30
2	H	43	ARG	NE-CZ-NH2	-6.23	117.19	120.30
2	H	152	ARG	NE-CZ-NH2	-6.21	117.19	120.30
2	N	43	ARG	NE-CZ-NH2	-6.20	117.20	120.30
2	I	152	ARG	NE-CZ-NH2	-6.19	117.20	120.30
2	K	43	ARG	NE-CZ-NH2	-6.16	117.22	120.30
2	I	43	ARG	NE-CZ-NH2	-6.16	117.22	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	197	TYR	CB-CG-CD1	-5.07	117.96	121.00
1	F	197	TYR	CB-CG-CD1	-5.06	117.96	121.00
1	B	197	TYR	CB-CG-CD1	-5.04	117.98	121.00
1	C	197	TYR	CB-CG-CD1	-5.03	117.98	121.00
1	A	197	TYR	CB-CG-CD1	-5.02	117.99	121.00
1	G	197	TYR	CB-CG-CD1	-5.01	117.99	121.00

All (7) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
3	V	7	MP8	CA
3	W	7	MP8	CA
3	X	7	MP8	CA
3	Y	7	MP8	CA
3	Z	7	MP8	CA
3	a	7	MP8	CA
3	b	7	MP8	CA

There are no planarity outliers.

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	1508	0	1520	8	0
1	B	1508	0	1520	8	0
1	C	1508	0	1520	2	0
1	D	1508	0	1520	3	0
1	E	1508	0	1520	9	0
1	F	1508	0	1520	8	0
1	G	1508	0	1520	8	0
2	H	1357	0	1349	1	0
2	I	1357	0	1349	1	0
2	J	1357	0	1349	1	0
2	K	1357	0	1349	1	0
2	L	1357	0	1349	1	0
2	M	1357	0	1349	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	N	1357	0	1349	1	0
3	V	56	0	40	9	0
3	W	56	0	40	9	0
3	X	56	0	40	9	0
3	Y	56	0	40	9	0
3	Z	56	0	40	9	0
3	a	56	0	40	0	0
3	b	56	0	40	0	0
All	All	20447	0	20363	63	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 2.

All (63) 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:110:SER:OG	1:F:111:ALA:N	2.41	0.54
1:E:110:SER:OG	1:E:111:ALA:N	2.41	0.54
1:E:95:TYR:CE2	3:Y:2:WFP:HD2	2.43	0.54
1:A:95:TYR:CE2	3:V:2:WFP:HD2	2.43	0.54
3:Y:3:ALO:HA	3:Y:4:PRO:C	2.29	0.53
1:D:95:TYR:CE2	3:Z:2:WFP:HD2	2.43	0.53
1:F:95:TYR:CE2	3:X:2:WFP:HD2	2.43	0.53
1:G:95:TYR:CE2	3:W:2:WFP:HD2	2.43	0.53
3:W:3:ALO:HA	3:W:4:PRO:C	2.29	0.53
3:Z:3:ALO:HA	3:Z:4:PRO:C	2.29	0.53
1:G:39:GLU:O	3:X:7:MP8:HE	2.09	0.53
1:D:110:SER:OG	1:D:111:ALA:N	2.41	0.53
1:B:39:GLU:O	3:V:7:MP8:HE	2.09	0.53
1:E:39:GLU:O	3:Z:7:MP8:HE	2.09	0.53
3:X:3:ALO:HA	3:X:4:PRO:C	2.29	0.52
1:A:39:GLU:O	3:W:7:MP8:HE	2.09	0.52
1:A:39:GLU:O	3:W:7:MP8:CE	2.58	0.52
1:E:39:GLU:O	3:Z:7:MP8:CE	2.58	0.52
1:F:39:GLU:O	3:Y:7:MP8:HE	2.09	0.52
1:B:39:GLU:O	3:V:7:MP8:CE	2.58	0.52
1:A:110:SER:OG	1:A:111:ALA:N	2.41	0.52
1:C:110:SER:OG	1:C:111:ALA:N	2.41	0.52
1:G:39:GLU:O	3:X:7:MP8:CE	2.58	0.51
1:F:39:GLU:O	3:Y:7:MP8:CE	2.58	0.51
3:V:3:ALO:HA	3:V:4:PRO:C	2.29	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:110:SER:OG	1:B:111:ALA:N	2.41	0.50
3:V:3:ALO:CB	3:V:4:PRO:HA	2.42	0.49
1:F:101:GLN:NE2	3:Y:6:ALA:HA	2.28	0.49
3:Z:3:ALO:CB	3:Z:4:PRO:HA	2.42	0.49
1:E:101:GLN:NE2	3:Z:6:ALA:HA	2.28	0.49
1:G:101:GLN:NE2	3:X:6:ALA:HA	2.28	0.48
3:W:3:ALO:CB	3:W:4:PRO:HA	2.42	0.48
3:X:3:ALO:CB	3:X:4:PRO:HA	2.42	0.48
3:Y:3:ALO:CB	3:Y:4:PRO:HA	2.42	0.48
1:A:101:GLN:NE2	3:W:6:ALA:HA	2.28	0.48
1:E:39:GLU:HG3	3:Z:1:R0M:C2	2.44	0.48
1:B:101:GLN:NE2	3:V:6:ALA:HA	2.28	0.47
1:G:39:GLU:HG3	3:X:1:R0M:C2	2.44	0.47
1:B:39:GLU:HG3	3:V:1:R0M:C2	2.44	0.47
1:A:39:GLU:HG3	3:W:1:R0M:C2	2.44	0.47
1:F:39:GLU:HG3	3:Y:1:R0M:C2	2.44	0.47
1:A:101:GLN:HE22	3:W:6:ALA:HA	1.80	0.46
1:E:101:GLN:HE22	3:Z:6:ALA:HA	1.80	0.46
1:G:101:GLN:HE22	3:X:6:ALA:HA	1.80	0.46
1:B:101:GLN:HE22	3:V:6:ALA:HA	1.80	0.46
1:G:110:SER:OG	1:G:111:ALA:N	2.41	0.46
1:F:101:GLN:HE22	3:Y:6:ALA:HA	1.80	0.45
1:A:75:TYR:CZ	3:W:2:WFP:HD1	2.52	0.45
1:G:75:TYR:CZ	3:X:2:WFP:HD1	2.52	0.45
1:B:75:TYR:CZ	3:V:2:WFP:HD1	2.52	0.45
1:F:75:TYR:CZ	3:Y:2:WFP:HD1	2.52	0.45
1:E:75:TYR:CZ	3:Z:2:WFP:HD1	2.52	0.44
2:K:123:HIS:CG	2:K:124:GLN:H	2.37	0.43
2:L:123:HIS:CG	2:L:124:GLN:H	2.37	0.43
2:N:123:HIS:CG	2:N:124:GLN:H	2.37	0.43
2:J:123:HIS:CG	2:J:124:GLN:H	2.37	0.42
2:M:123:HIS:CG	2:M:124:GLN:H	2.37	0.42
2:H:123:HIS:CG	2:H:124:GLN:H	2.37	0.42
2:I:123:HIS:CG	2:I:124:GLN:H	2.37	0.42
1:C:140:SER:OG	1:C:141:GLY:N	2.54	0.41
1:D:140:SER:OG	1:D:141:GLY:N	2.54	0.41
1:E:31:ASN:C	1:E:32:PRO:O	2.58	0.41
1:B:140:SER:OG	1:B:141:GLY:N	2.54	0.40

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

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	194/200 (97%)	186 (96%)	7 (4%)	1 (0%)	29	64
1	B	194/200 (97%)	186 (96%)	7 (4%)	1 (0%)	29	64
1	C	194/200 (97%)	186 (96%)	7 (4%)	1 (0%)	29	64
1	D	194/200 (97%)	186 (96%)	7 (4%)	1 (0%)	29	64
1	E	194/200 (97%)	186 (96%)	7 (4%)	1 (0%)	29	64
1	F	194/200 (97%)	186 (96%)	7 (4%)	1 (0%)	29	64
1	G	194/200 (97%)	186 (96%)	7 (4%)	1 (0%)	29	64
2	H	176/194 (91%)	170 (97%)	5 (3%)	1 (1%)	25	59
2	I	176/194 (91%)	170 (97%)	5 (3%)	1 (1%)	25	59
2	J	176/194 (91%)	170 (97%)	5 (3%)	1 (1%)	25	59
2	K	176/194 (91%)	170 (97%)	5 (3%)	1 (1%)	25	59
2	L	176/194 (91%)	170 (97%)	5 (3%)	1 (1%)	25	59
2	M	176/194 (91%)	170 (97%)	5 (3%)	1 (1%)	25	59
2	N	176/194 (91%)	170 (97%)	5 (3%)	1 (1%)	25	59
3	V	2/7 (29%)	1 (50%)	1 (50%)	0	100	100
3	W	2/7 (29%)	1 (50%)	1 (50%)	0	100	100
3	X	2/7 (29%)	1 (50%)	1 (50%)	0	100	100
3	Y	2/7 (29%)	1 (50%)	1 (50%)	0	100	100
3	Z	2/7 (29%)	1 (50%)	1 (50%)	0	100	100
3	a	2/7 (29%)	1 (50%)	1 (50%)	0	100	100
3	b	2/7 (29%)	1 (50%)	1 (50%)	0	100	100
All	All	2604/2807 (93%)	2499 (96%)	91 (4%)	14 (0%)	32	64

All (14) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	H	35	GLU
2	I	35	GLU
2	J	35	GLU
2	K	35	GLU
2	L	35	GLU
2	M	35	GLU
2	N	35	GLU
1	A	145	GLY
1	B	145	GLY
1	C	145	GLY
1	D	145	GLY
1	E	145	GLY
1	F	145	GLY
1	G	145	GLY

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	163/165 (99%)	163 (100%)	0	100	100
1	B	163/165 (99%)	163 (100%)	0	100	100
1	C	163/165 (99%)	163 (100%)	0	100	100
1	D	163/165 (99%)	163 (100%)	0	100	100
1	E	163/165 (99%)	163 (100%)	0	100	100
1	F	163/165 (99%)	163 (100%)	0	100	100
1	G	163/165 (99%)	163 (100%)	0	100	100
2	H	139/151 (92%)	139 (100%)	0	100	100
2	I	139/151 (92%)	139 (100%)	0	100	100
2	J	139/151 (92%)	139 (100%)	0	100	100
2	K	139/151 (92%)	139 (100%)	0	100	100
2	L	139/151 (92%)	139 (100%)	0	100	100
2	M	139/151 (92%)	139 (100%)	0	100	100
2	N	139/151 (92%)	139 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
3	V	1/1 (100%)	1 (100%)	0	100	100
3	W	1/1 (100%)	1 (100%)	0	100	100
3	X	1/1 (100%)	1 (100%)	0	100	100
3	Y	1/1 (100%)	1 (100%)	0	100	100
3	Z	1/1 (100%)	1 (100%)	0	100	100
3	a	1/1 (100%)	1 (100%)	0	100	100
3	b	1/1 (100%)	1 (100%)	0	100	100
All	All	2121/2219 (96%)	2121 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (7) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	47	GLN
1	B	47	GLN
1	C	47	GLN
1	D	47	GLN
1	E	47	GLN
1	F	47	GLN
1	G	47	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

28 non-standard protein/DNA/RNA residues are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. 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 $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	ALO	a	3	3	5,6,7	0.65	0	6,7,9	2.07	1 (16%)
3	MP8	Z	7	3	5,8,9	1.34	1 (20%)	3,10,12	0.88	0
3	YCP	Z	5	3	6,8,9	0.47	0	5,9,11	1.29	1 (20%)
3	MP8	b	7	3	5,8,9	1.34	1 (20%)	3,10,12	0.88	0
3	ALO	V	3	3	5,6,7	0.64	0	6,7,9	2.07	1 (16%)
3	WFP	X	2	3	12,13,14	0.68	0	14,17,19	1.58	4 (28%)
3	WFP	W	2	3	12,13,14	0.67	0	14,17,19	1.58	4 (28%)
3	YCP	Y	5	3	6,8,9	0.47	0	5,9,11	1.28	1 (20%)
3	MP8	X	7	3	5,8,9	1.33	1 (20%)	3,10,12	0.88	0
3	WFP	V	2	3	12,13,14	0.68	0	14,17,19	1.59	5 (35%)
3	ALO	X	3	3	5,6,7	0.63	0	6,7,9	2.06	1 (16%)
3	ALO	Z	3	3	5,6,7	0.63	0	6,7,9	2.06	1 (16%)
3	ALO	W	3	3	5,6,7	0.64	0	6,7,9	2.07	1 (16%)
3	MP8	a	7	3	5,8,9	1.33	1 (20%)	3,10,12	0.89	0
3	MP8	V	7	3	5,8,9	1.34	1 (20%)	3,10,12	0.88	0
3	YCP	X	5	3	6,8,9	0.47	0	5,9,11	1.30	1 (20%)
3	ALO	b	3	3	5,6,7	0.65	0	6,7,9	2.07	1 (16%)
3	WFP	a	2	3	12,13,14	0.66	0	14,17,19	1.58	5 (35%)
3	WFP	Z	2	3	12,13,14	0.69	0	14,17,19	1.60	5 (35%)
3	MP8	W	7	3	5,8,9	1.34	1 (20%)	3,10,12	0.88	0
3	WFP	Y	2	3	12,13,14	0.68	0	14,17,19	1.59	5 (35%)
3	YCP	a	5	3	6,8,9	0.47	0	5,9,11	1.30	1 (20%)
3	ALO	Y	3	3	5,6,7	0.63	0	6,7,9	2.07	1 (16%)
3	YCP	V	5	3	6,8,9	0.47	0	5,9,11	1.29	1 (20%)
3	MP8	Y	7	3	5,8,9	1.34	1 (20%)	3,10,12	0.88	0
3	YCP	b	5	3	6,8,9	0.47	0	5,9,11	1.30	1 (20%)
3	WFP	b	2	3	12,13,14	0.68	0	14,17,19	1.59	5 (35%)
3	YCP	W	5	3	6,8,9	0.47	0	5,9,11	1.30	1 (20%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	ALO	a	3	3	-	4/5/6/8	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	MP8	Z	7	3	1/1/2/4	0/0/11/13	0/1/1/1
3	YCP	Z	5	3	-	0/1/10/12	0/1/1/1
3	MP8	b	7	3	1/1/2/4	0/0/11/13	0/1/1/1
3	ALO	V	3	3	-	4/5/6/8	-
3	WFP	X	2	3	-	1/5/6/8	0/1/1/1
3	WFP	W	2	3	-	1/5/6/8	0/1/1/1
3	YCP	Y	5	3	-	0/1/10/12	0/1/1/1
3	MP8	X	7	3	1/1/2/4	0/0/11/13	0/1/1/1
3	WFP	V	2	3	-	1/5/6/8	0/1/1/1
3	ALO	X	3	3	-	4/5/6/8	-
3	ALO	Z	3	3	-	4/5/6/8	-
3	ALO	W	3	3	-	4/5/6/8	-
3	MP8	a	7	3	1/1/2/4	0/0/11/13	0/1/1/1
3	MP8	V	7	3	1/1/2/4	0/0/11/13	0/1/1/1
3	YCP	X	5	3	-	0/1/10/12	0/1/1/1
3	ALO	b	3	3	-	4/5/6/8	-
3	WFP	a	2	3	-	1/5/6/8	0/1/1/1
3	WFP	Z	2	3	-	1/5/6/8	0/1/1/1
3	MP8	W	7	3	1/1/2/4	0/0/11/13	0/1/1/1
3	WFP	Y	2	3	-	1/5/6/8	0/1/1/1
3	YCP	a	5	3	-	0/1/10/12	0/1/1/1
3	ALO	Y	3	3	-	4/5/6/8	-
3	YCP	V	5	3	-	0/1/10/12	0/1/1/1
3	MP8	Y	7	3	1/1/2/4	0/0/11/13	0/1/1/1
3	YCP	b	5	3	-	0/1/10/12	0/1/1/1
3	WFP	b	2	3	-	1/5/6/8	0/1/1/1
3	YCP	W	5	3	-	0/1/10/12	0/1/1/1

All (7) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	Y	7	MP8	CB-CA	-2.78	1.48	1.54
3	Z	7	MP8	CB-CA	-2.77	1.48	1.54
3	b	7	MP8	CB-CA	-2.76	1.48	1.54
3	V	7	MP8	CB-CA	-2.76	1.48	1.54
3	W	7	MP8	CB-CA	-2.76	1.48	1.54
3	a	7	MP8	CB-CA	-2.74	1.48	1.54
3	X	7	MP8	CB-CA	-2.74	1.48	1.54

All (47) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed($^{\circ}$)	Ideal($^{\circ}$)
3	Y	3	ALO	OG1-CB-CA	-4.20	100.15	109.06
3	a	3	ALO	OG1-CB-CA	-4.18	100.18	109.06
3	V	3	ALO	OG1-CB-CA	-4.18	100.18	109.06
3	b	3	ALO	OG1-CB-CA	-4.18	100.20	109.06
3	Z	3	ALO	OG1-CB-CA	-4.17	100.20	109.06
3	W	3	ALO	OG1-CB-CA	-4.17	100.21	109.06
3	X	3	ALO	OG1-CB-CA	-4.16	100.23	109.06
3	Z	2	WFP	CD1-CE1-CZ	-2.56	120.29	123.52
3	X	2	WFP	CD1-CE1-CZ	-2.53	120.32	123.52
3	Y	2	WFP	CG-CB-CA	-2.53	108.97	114.10
3	X	2	WFP	CG-CB-CA	-2.53	108.98	114.10
3	a	2	WFP	CG-CB-CA	-2.53	108.98	114.10
3	Z	2	WFP	CG-CB-CA	-2.53	108.98	114.10
3	Y	2	WFP	CD1-CE1-CZ	-2.53	120.33	123.52
3	V	2	WFP	CD1-CE1-CZ	-2.52	120.33	123.52
3	V	2	WFP	CG-CB-CA	-2.52	109.01	114.10
3	b	2	WFP	CD1-CE1-CZ	-2.51	120.34	123.52
3	b	2	WFP	CG-CB-CA	-2.51	109.01	114.10
3	W	2	WFP	CG-CB-CA	-2.51	109.02	114.10
3	a	2	WFP	CD1-CE1-CZ	-2.50	120.36	123.52
3	W	2	WFP	CD1-CE1-CZ	-2.50	120.36	123.52
3	b	2	WFP	F2-CE2-CD2	2.16	121.34	118.25
3	Z	2	WFP	F1-CE1-CD1	2.15	121.33	118.25
3	Y	2	WFP	F2-CE2-CD2	2.15	121.33	118.25
3	V	2	WFP	F2-CE2-CD2	2.15	121.32	118.25
3	W	2	WFP	F2-CE2-CD2	2.14	121.30	118.25
3	W	2	WFP	F1-CE1-CD1	2.13	121.30	118.25
3	X	2	WFP	F2-CE2-CD2	2.13	121.29	118.25
3	Z	2	WFP	F2-CE2-CD2	2.13	121.29	118.25
3	V	2	WFP	F1-CE1-CD1	2.12	121.29	118.25
3	b	2	WFP	F1-CE1-CD1	2.12	121.28	118.25
3	a	2	WFP	F2-CE2-CD2	2.12	121.28	118.25
3	Y	2	WFP	F1-CE1-CD1	2.11	121.27	118.25
3	a	2	WFP	F1-CE1-CD1	2.11	121.26	118.25
3	X	2	WFP	F1-CE1-CD1	2.10	121.26	118.25
3	W	5	YCP	O-C-CA	-2.06	119.39	124.78
3	b	5	YCP	O-C-CA	-2.05	119.41	124.78
3	X	5	YCP	O-C-CA	-2.05	119.41	124.78
3	a	5	YCP	O-C-CA	-2.04	119.43	124.78
3	V	5	YCP	O-C-CA	-2.04	119.44	124.78
3	Z	5	YCP	O-C-CA	-2.04	119.44	124.78
3	Z	2	WFP	CE2-CZ-CE1	2.03	119.29	116.13
3	a	2	WFP	CE2-CZ-CE1	2.02	119.28	116.13

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	b	2	WFP	CE2-CZ-CE1	2.01	119.27	116.13
3	Y	5	YCP	O-C-CA	-2.01	119.52	124.78
3	V	2	WFP	CE2-CZ-CE1	2.01	119.25	116.13
3	Y	2	WFP	CE2-CZ-CE1	2.00	119.25	116.13

All (7) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
3	Z	7	MP8	CA
3	b	7	MP8	CA
3	X	7	MP8	CA
3	a	7	MP8	CA
3	V	7	MP8	CA
3	W	7	MP8	CA
3	Y	7	MP8	CA

All (35) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	a	3	ALO	C-CA-CB-CG2
3	a	3	ALO	C-CA-CB-OG1
3	a	3	ALO	O-C-CA-CB
3	V	3	ALO	C-CA-CB-CG2
3	V	3	ALO	C-CA-CB-OG1
3	V	3	ALO	O-C-CA-CB
3	X	3	ALO	C-CA-CB-CG2
3	X	3	ALO	C-CA-CB-OG1
3	X	3	ALO	O-C-CA-CB
3	Z	3	ALO	C-CA-CB-CG2
3	Z	3	ALO	C-CA-CB-OG1
3	Z	3	ALO	O-C-CA-CB
3	W	3	ALO	C-CA-CB-CG2
3	W	3	ALO	C-CA-CB-OG1
3	W	3	ALO	O-C-CA-CB
3	b	3	ALO	C-CA-CB-CG2
3	b	3	ALO	C-CA-CB-OG1
3	b	3	ALO	O-C-CA-CB
3	Y	3	ALO	C-CA-CB-CG2
3	Y	3	ALO	C-CA-CB-OG1
3	Y	3	ALO	O-C-CA-CB
3	a	3	ALO	N-CA-CB-CG2
3	V	3	ALO	N-CA-CB-CG2

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Mol	Chain	Res	Type	Atoms
3	X	3	ALO	N-CA-CB-CG2
3	Z	3	ALO	N-CA-CB-CG2
3	W	3	ALO	N-CA-CB-CG2
3	b	3	ALO	N-CA-CB-CG2
3	Y	3	ALO	N-CA-CB-CG2
3	X	2	WFP	C-CA-CB-CG
3	W	2	WFP	C-CA-CB-CG
3	V	2	WFP	C-CA-CB-CG
3	a	2	WFP	C-CA-CB-CG
3	Z	2	WFP	C-CA-CB-CG
3	Y	2	WFP	C-CA-CB-CG
3	b	2	WFP	C-CA-CB-CG

There are no ring outliers.

15 monomers are involved in 30 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	Z	7	MP8	2	0
3	V	3	ALO	2	0
3	X	2	WFP	2	0
3	W	2	WFP	2	0
3	X	7	MP8	2	0
3	V	2	WFP	2	0
3	X	3	ALO	2	0
3	Z	3	ALO	2	0
3	W	3	ALO	2	0
3	V	7	MP8	2	0
3	Z	2	WFP	2	0
3	W	7	MP8	2	0
3	Y	2	WFP	2	0
3	Y	3	ALO	2	0
3	Y	7	MP8	2	0

5.5 Carbohydrates [i](#)

There are no carbohydrates 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.

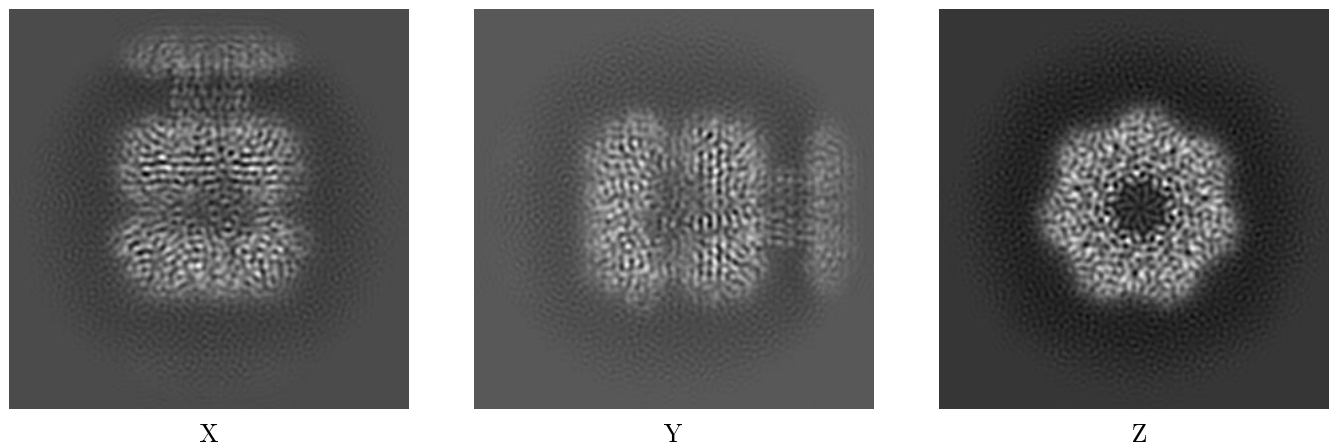
5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Map visualisation [i](#)

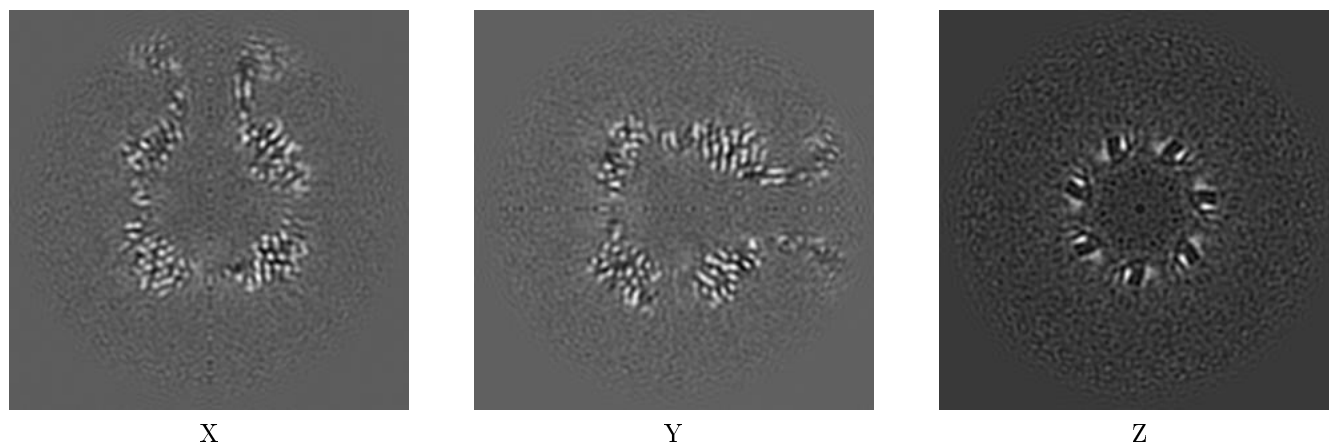
This section contains visualisations of the EMDB entry EMD-21198. These are intended to permit visual inspection of the internal detail of the map and identification of artifacts.

6.1 Orthogonal projections [i](#)



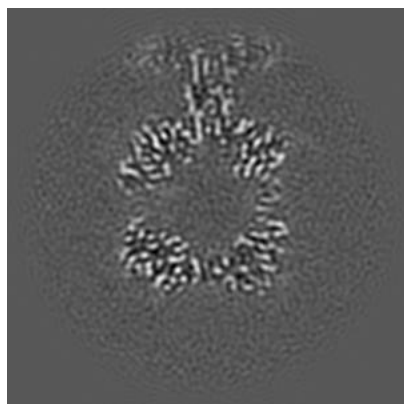
The images above show the map projected in three orthogonal projections, in greyscale.

6.2 Central slices [i](#)

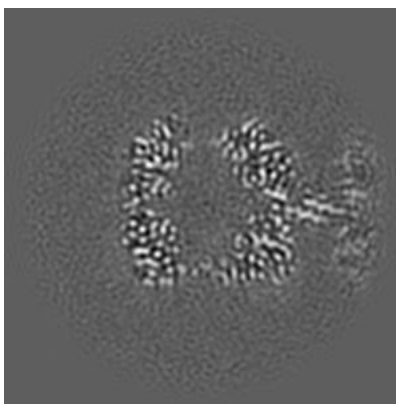


The images above show central slices of the map in three orthogonal directions, in greyscale.

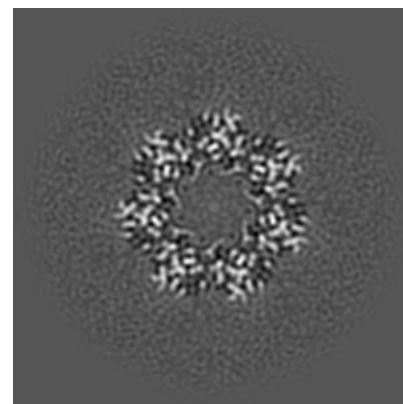
6.3 Largest variance slices [i](#)



X Index: 77



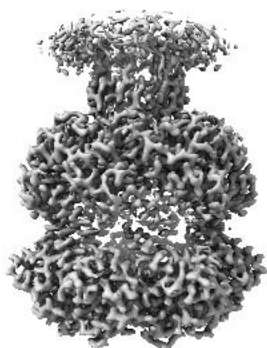
Y Index: 109



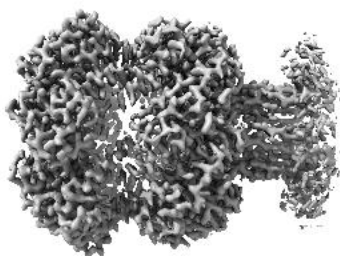
Z Index: 70

The images above show the highest variance slices of the map in three orthogonal directions, in greyscale.

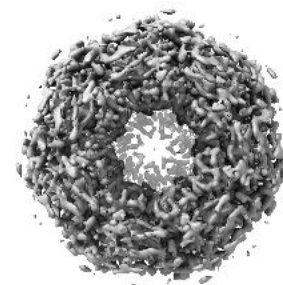
6.4 Orthogonal surface views [i](#)



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 1.3. This in conjunction with the slice images can indicate whether an appropriate contour level has been selected.

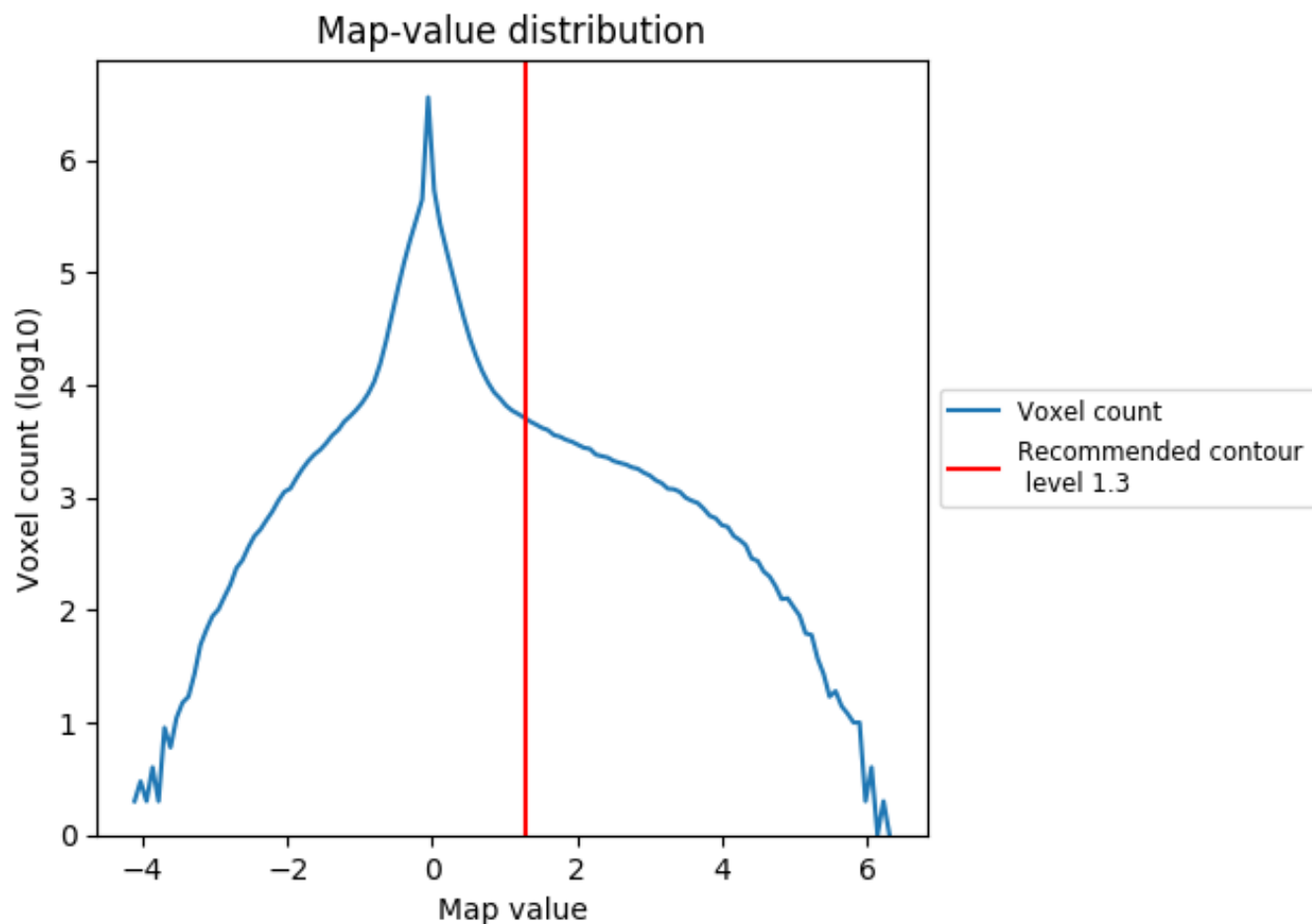
6.5 Mask visualisation [i](#)

This section was not generated. No masks were provided.

7 Map analysis [i](#)

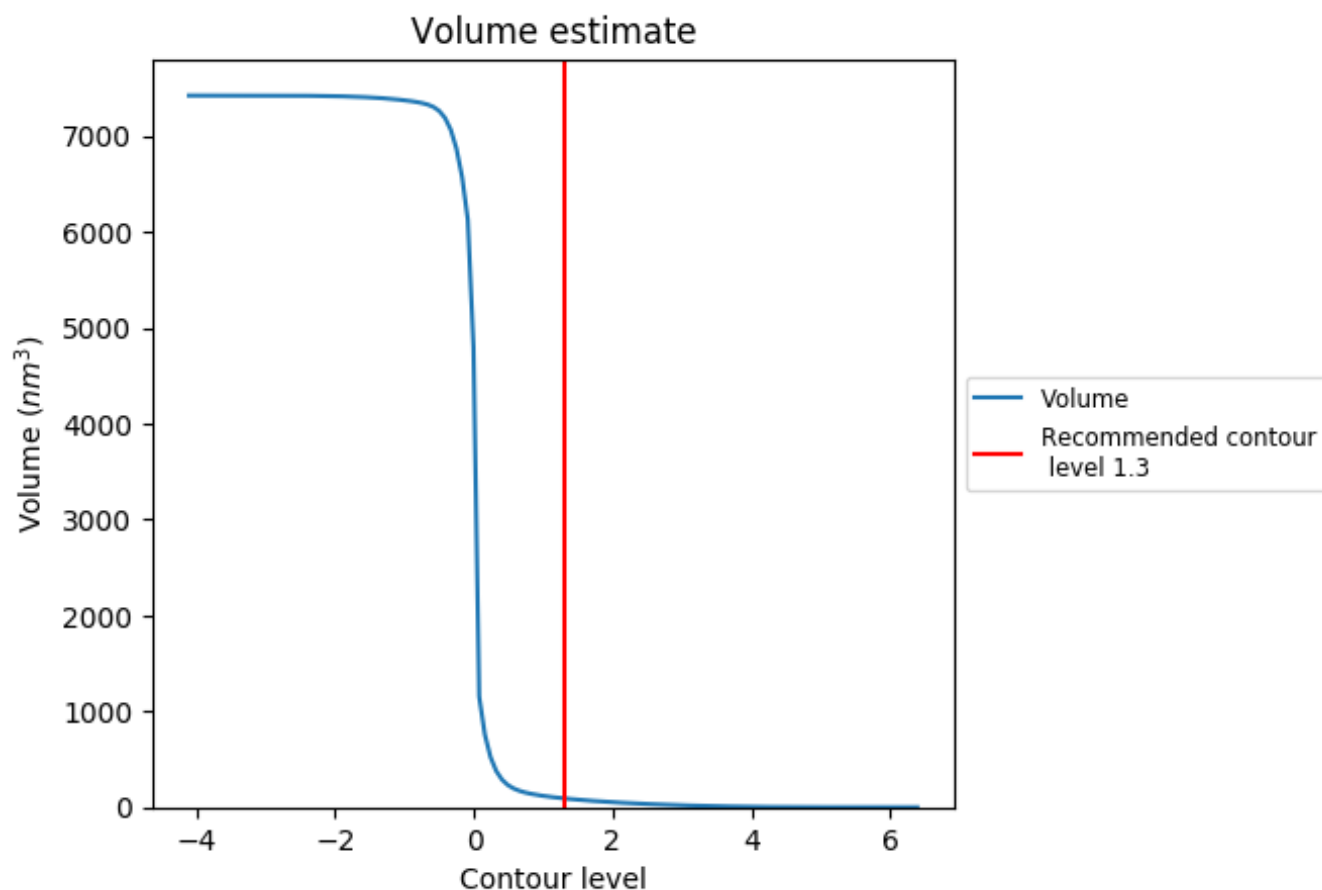
This section contains the results of statistical analysis of the map.

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.

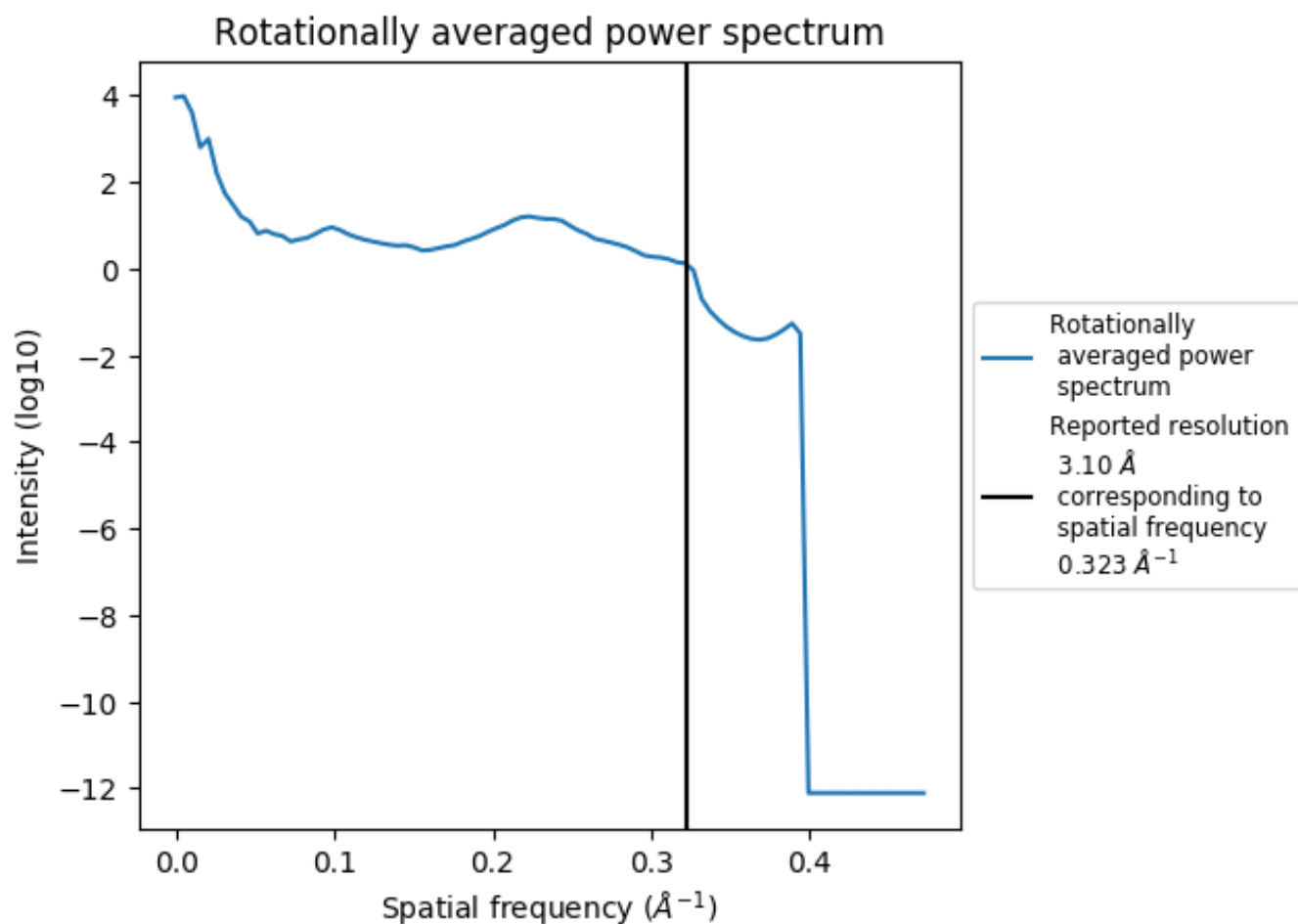
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 92 nm^3 ; this corresponds to an approximate mass of 83 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 [\(i\)](#)



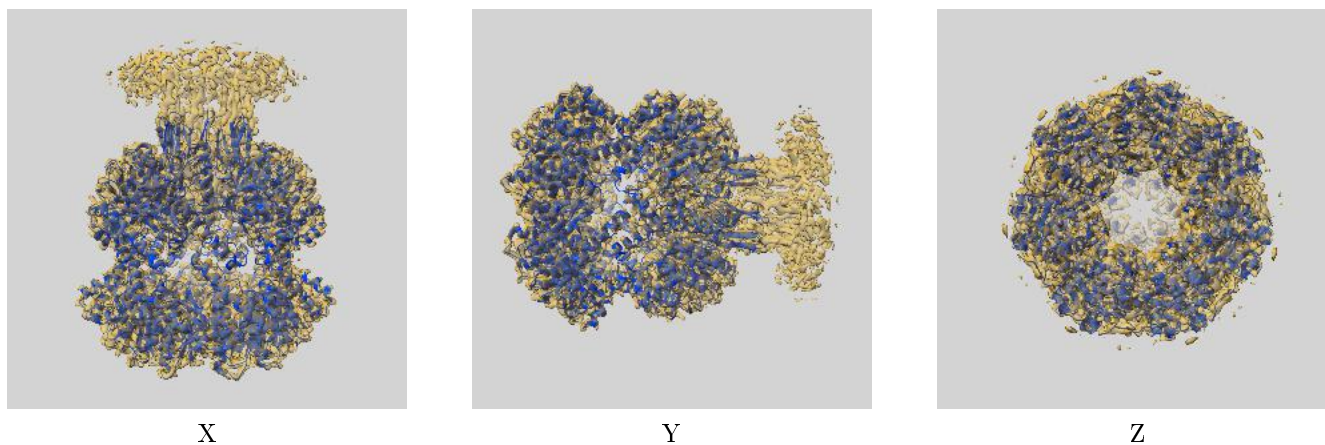
8 Fourier-Shell correlation

This section was not generated. No FSC curve or half maps provided.

9 Map-model fit [i](#)

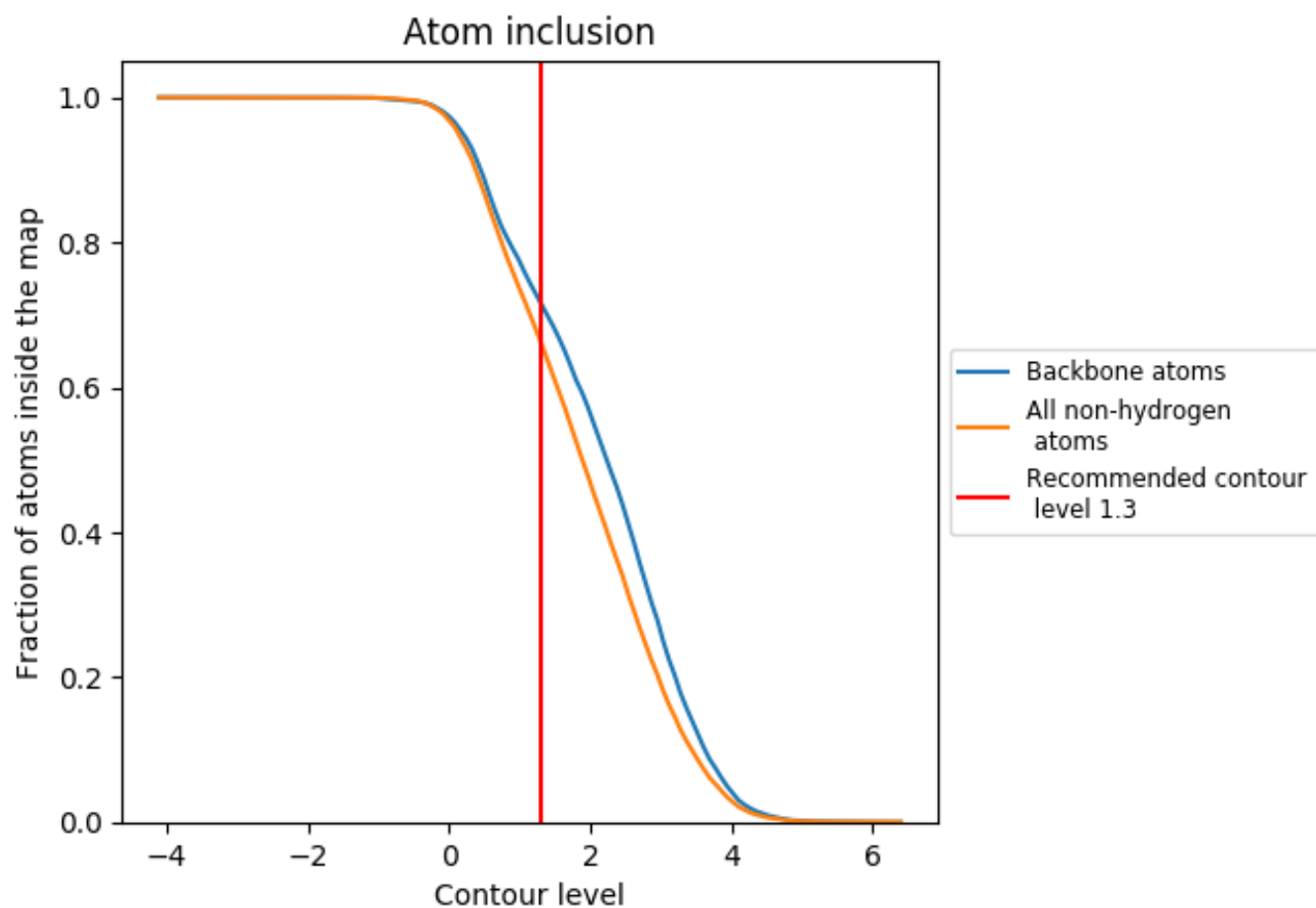
This section contains information regarding the fit between EMDB map EMD-21198 and PDB model 6VGN. Per-residue inclusion information can be found in section [3](#) on page [6](#).

9.1 Map-model overlay [i](#)



The images above show the 3D surface view of the map at the recommended contour level 1.3 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 Atom inclusion [i](#)



At the recommended contour level, 72% of all backbone atoms, 66% of all non-hydrogen atoms, are inside the map.