Full wwPDB EM Validation Report

Jun 17, 2025 – 06:37 PM JST

PDB ID	:	8ZKM / pdb_00008zkm
EMDB ID	:	EMD-60199
Title	:	portal-tail of Vibrio cholerae typing phage release VP1
Authors	:	Liu, H.R.; Pang, H.
Deposited on	:	2024-05-16
Resolution	:	6.70 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:

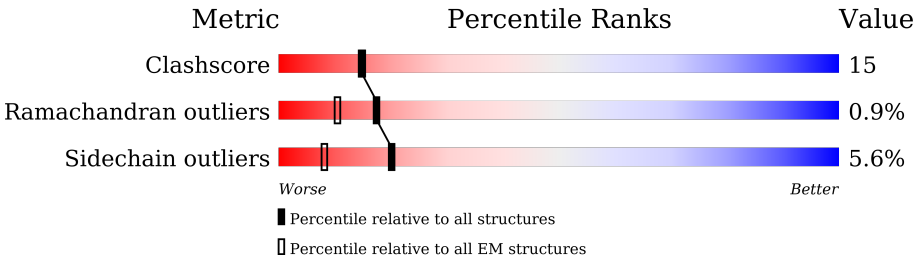
EMDB validation analysis	:	0.0.1.dev118
MolProbity	:	4-5-2 with Phenix2.0rc1
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.44

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 6.70 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion < 40%). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	239	6% 92%
2	B	202	58% 41%
2	C	202	60% 35%
3	E	521	54% 44%
4	K	581	7% 67% 28%
4	L	581	7% 67% 28%

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 16911 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 ring protein of release VP1.

Mol	Chain	Residues	Atoms				AltConf	Trace
1	A	19	Total	C	N	O	0	0
			153	98	25	30		

- Molecule 2 is a protein called adaptor of release VP1.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	202	Total	C	N	O	S	0	0
			1660	1061	281	310	8		
2	C	202	Total	C	N	O	S	0	0
			1660	1061	281	310	8		

- Molecule 3 is a protein called nozzle of release VP1.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	E	521	Total	C	N	O	S	0	0
			4168	2678	689	789	12		

- Molecule 4 is a protein called portal of release VP1.

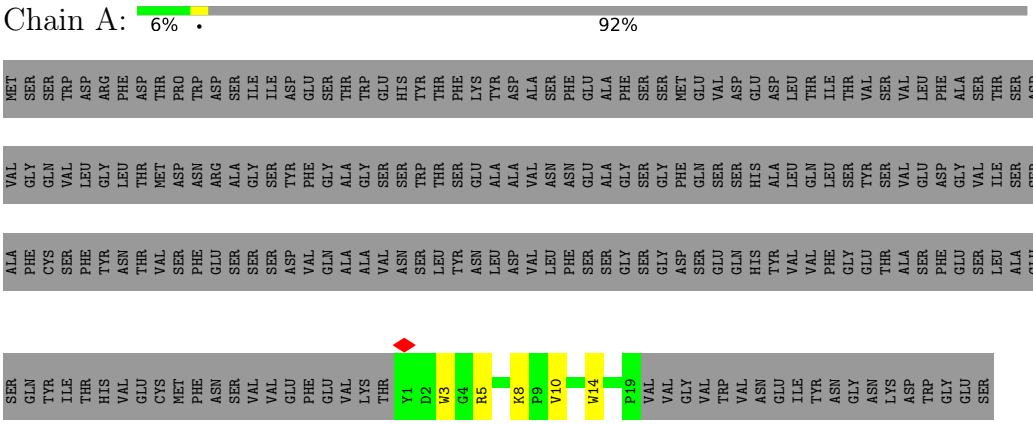
Mol	Chain	Residues	Atoms					AltConf	Trace
4	K	581	Total	C	N	O	S	0	0
			4635	2963	777	866	29		
4	L	581	Total	C	N	O	S	0	0
			4635	2963	777	866	29		

3 Residue-property plots (i)

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

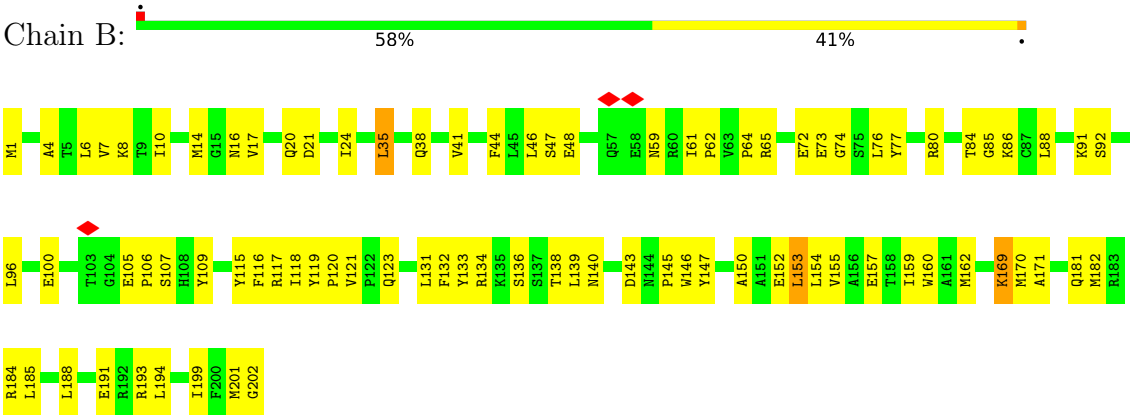
• Molecule 1: ring protein of release VP1

Chain A:



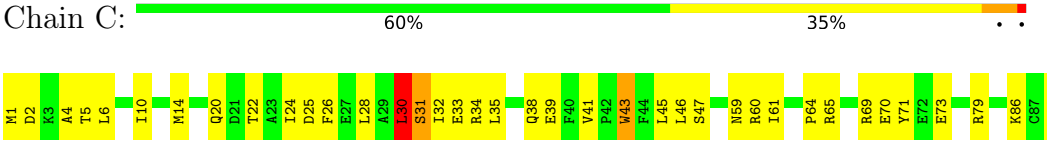
• Molecule 2: adaptor of release VP1

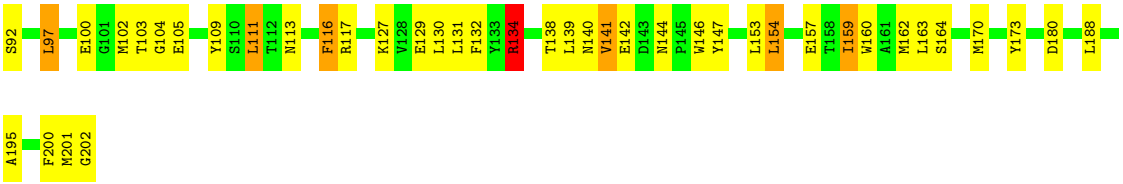
Chain B:



• Molecule 2: adaptor of release VP1

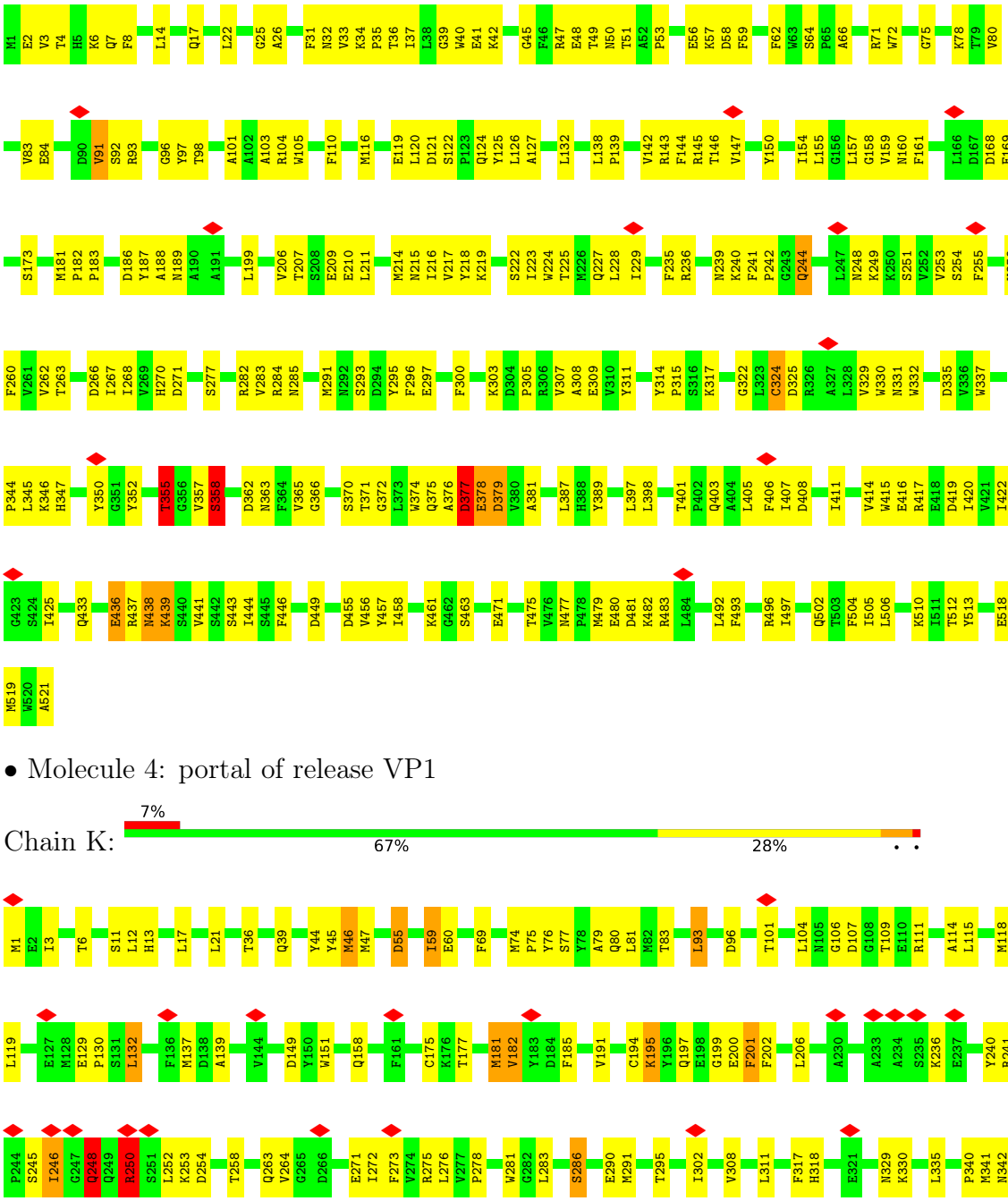
Chain C:





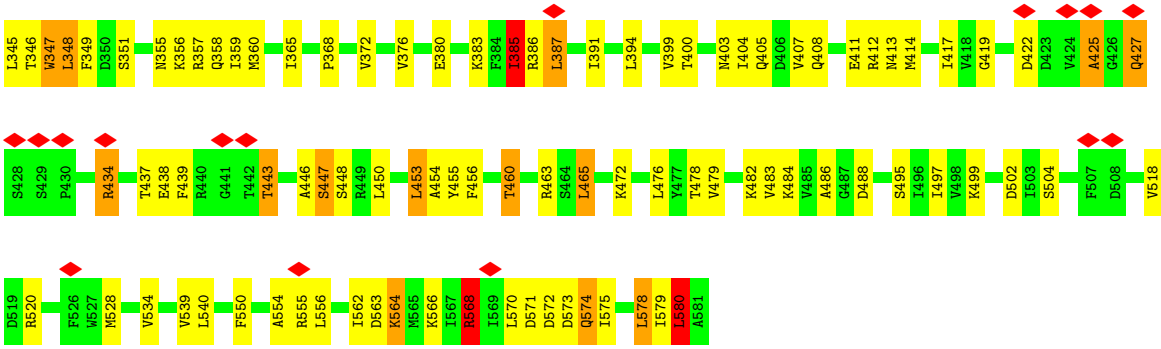
• Molecule 3: nozzle of release VP1

Chain E:



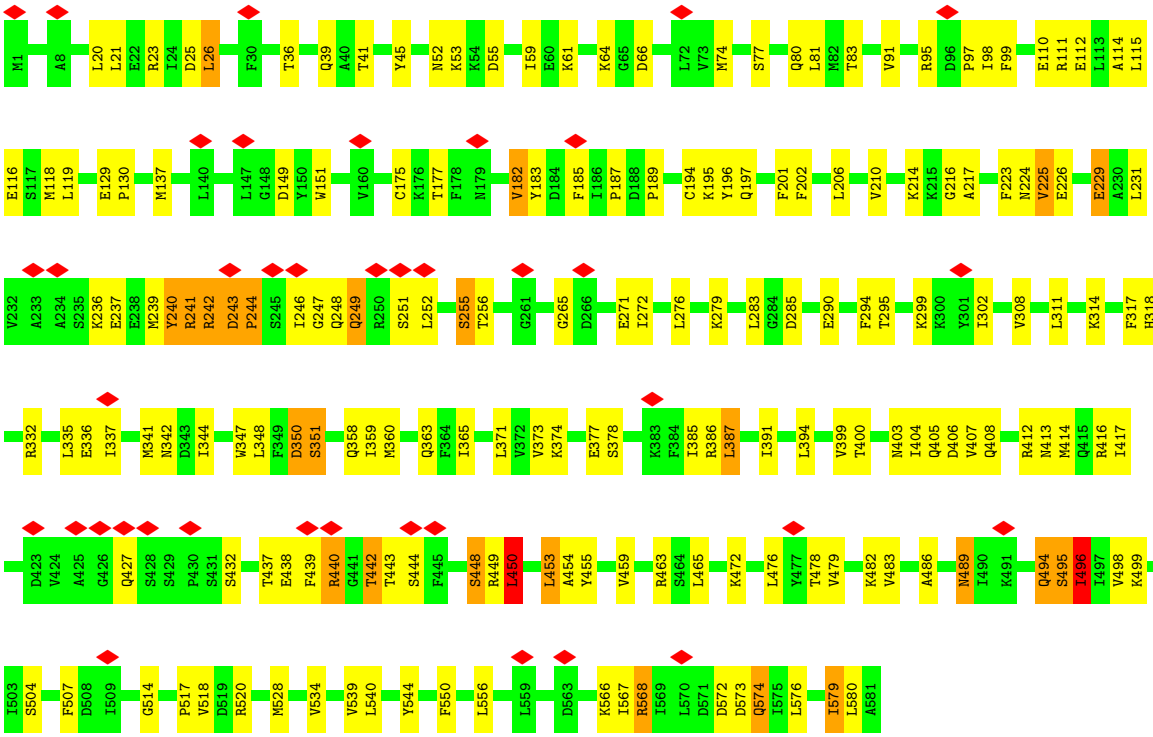
• Molecule 4: portal of release VP1

Chain K:



• Molecule 4: portal of release VP1

Chain L:



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	1698	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING ONLY	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	32	Depositor
Minimum defocus (nm)	1600	Depositor
Maximum defocus (nm)	2200	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	8.026	Depositor
Minimum map value	-4.464	Depositor
Average map value	0.003	Depositor
Map value standard deviation	0.527	Depositor
Recommended contour level	1.5	Depositor
Map size (Å)	440.0, 440.0, 440.0	wwPDB
Map dimensions	400, 400, 400	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.1, 1.1, 1.1	Depositor

5 Model quality

5.1 Standard geometry

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#$\|Z\|$ >5	RMSZ	#$\|Z\|$ >5
1	A	0.21	0/160	0.39	0/221
2	B	0.74	0/1696	0.78	3/2289 (0.1%)
2	C	1.06	2/1696 (0.1%)	1.14	20/2289 (0.9%)
3	E	0.34	0/4287	0.66	15/5830 (0.3%)
4	K	0.85	7/4731 (0.1%)	1.02	45/6390 (0.7%)
4	L	0.71	2/4731 (0.0%)	0.92	34/6390 (0.5%)
All	All	0.73	11/17301 (0.1%)	0.90	117/23409 (0.5%)

All (11) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	K	79	ALA	C-N	10.04	1.47	1.33
4	K	448	SER	CA-C	-9.39	1.44	1.53
4	K	45	TYR	CA-C	-7.15	1.43	1.52
4	K	273	PHE	C-N	-6.29	1.25	1.33
4	K	329	ASN	CA-C	-5.75	1.45	1.52
4	L	45	TYR	CA-C	-5.56	1.45	1.52
2	C	90	LYS	CA-C	-5.20	1.46	1.52
4	L	486	ALA	CA-C	-5.12	1.46	1.52
4	K	349	PHE	CA-C	-5.11	1.46	1.52
4	K	139	ALA	CA-C	-5.08	1.46	1.52
2	C	134	ARG	CA-C	-5.01	1.46	1.52

All (117) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	K	93	LEU	N-CA-C	12.02	124.46	111.36
4	K	107	ASP	N-CA-C	-11.55	98.69	111.28
4	L	450	LEU	N-CA-C	-11.44	98.82	113.12
3	E	362	ASP	N-CA-C	10.31	122.47	111.03
2	C	111	LEU	N-CA-C	10.27	122.55	111.36
4	L	496	ILE	N-CA-C	10.03	120.44	111.81
4	L	572	ASP	CB-CA-C	-9.69	105.39	116.63

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	L	26	LEU	N-CA-C	-9.68	100.57	111.71
3	E	355	THR	N-CA-C	9.55	124.08	110.23
4	K	248	GLN	N-CA-C	-9.16	101.30	111.28
4	L	489	ASN	N-CA-C	-8.78	102.57	113.28
3	E	372	GLY	N-CA-C	-8.72	103.14	115.43
4	K	12	LEU	N-CA-C	-8.57	101.85	111.71
2	C	31	SER	N-CA-C	8.39	120.50	111.36
4	K	448	SER	CB-CA-C	-8.14	107.18	116.54
4	L	448	SER	N-CA-C	-8.04	101.55	113.61
4	K	447	SER	N-CA-C	-7.83	100.89	111.54
4	K	242	ARG	N-CA-C	7.80	119.86	111.36
4	K	96	ASP	CA-C-N	-7.65	110.51	118.85
4	K	96	ASP	C-N-CA	-7.65	110.51	118.85
4	K	199	GLY	N-CA-C	7.64	122.32	112.54
4	L	359	ILE	N-CA-C	7.61	118.90	111.67
3	E	363	ASN	N-CA-C	7.51	121.21	107.99
4	K	347	TRP	N-CA-C	-7.44	100.96	110.19
4	L	237	GLU	N-CA-C	7.36	119.38	111.36
4	L	385	ILE	N-CA-C	-7.30	101.97	110.21
2	B	153	LEU	N-CA-C	-7.28	103.34	111.28
4	K	96	ASP	N-CA-C	7.27	122.09	112.35
4	K	434	ARG	N-CA-C	-7.25	104.03	113.17
4	K	572	ASP	CB-CA-C	-7.25	106.19	116.34
4	L	242	ARG	N-CA-C	-7.24	103.38	111.71
4	L	229	GLU	N-CA-C	7.21	119.14	111.28
4	K	101	THR	N-CA-C	7.08	120.17	109.41
3	E	375	GLN	N-CA-C	6.90	119.47	110.43
4	K	580	LEU	N-CA-C	6.89	118.58	111.14
4	K	574	GLN	N-CA-C	-6.83	103.07	111.33
4	L	495	SER	N-CA-C	6.80	118.77	111.36
4	K	6	THR	N-CA-C	-6.74	98.82	109.07
2	C	195	ALA	N-CA-C	6.70	118.23	111.07
4	K	200	GLU	N-CA-C	6.58	118.46	111.28
4	L	344	ILE	N-CA-C	-6.53	103.96	110.62
4	K	246	ILE	N-CA-C	-6.53	102.89	111.05
3	E	371	THR	N-CA-C	-6.52	104.21	111.71
2	C	86	LYS	O-C-N	-6.51	116.19	123.48
2	C	104	GLY	N-CA-C	6.51	118.91	110.45
4	K	460	THR	N-CA-C	6.48	118.42	111.36
2	C	116	PHE	N-CA-C	-6.44	102.22	110.53
4	K	453	LEU	N-CA-C	-6.41	104.29	111.28
3	E	370	SER	N-CA-C	6.38	119.91	109.76

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	K	465	LEU	N-CA-C	-6.36	104.35	111.28
2	C	105	GLU	CA-C-N	-6.35	113.12	119.92
2	C	105	GLU	C-N-CA	-6.35	113.12	119.92
4	L	444	SER	N-CA-C	-6.28	104.43	111.28
4	L	246	ILE	N-CA-C	6.21	112.85	106.21
2	C	43	TRP	N-CA-C	6.05	120.80	113.17
4	L	574	GLN	N-CA-C	-6.04	104.70	111.28
4	K	443	THR	N-CA-C	6.04	117.53	111.07
4	K	419	GLY	N-CA-C	6.03	124.36	115.08
4	K	385	ILE	N-CA-C	-6.01	101.10	109.45
4	L	449	ARG	N-CA-C	-6.00	104.60	113.72
4	L	243	ASP	N-CA-C	5.98	120.62	112.55
4	L	246	ILE	CB-CA-C	-5.92	106.59	113.22
4	K	241	ARG	N-CA-C	5.91	120.53	112.68
4	L	249	GLN	N-CA-C	-5.90	104.85	111.28
3	E	358	SER	N-CA-C	5.84	123.23	110.80
2	C	153	LEU	N-CA-C	-5.80	104.95	111.28
2	B	169	LYS	N-CA-C	5.80	120.94	111.37
2	C	26	PHE	N-CA-C	-5.78	104.89	111.07
4	L	378	SER	N-CA-C	5.77	118.19	110.35
2	C	180	ASP	N-CA-C	-5.76	105.00	111.28
2	C	30	LEU	N-CA-C	-5.75	105.15	111.82
4	K	55	ASP	N-CA-C	5.74	117.54	111.28
2	C	117	ARG	CA-C-N	-5.74	115.44	123.13
2	C	117	ARG	C-N-CA	-5.74	115.44	123.13
4	K	258	THR	CA-C-N	-5.73	113.86	119.76
4	K	258	THR	C-N-CA	-5.73	113.86	119.76
3	E	322	GLY	N-CA-C	-5.64	107.87	115.21
4	L	226	GLU	N-CA-C	5.64	117.11	111.07
4	L	453	LEU	N-CA-C	-5.62	105.15	111.28
3	E	91	VAL	N-CA-C	-5.57	108.42	113.71
2	C	201	MET	N-CA-C	-5.56	106.54	113.15
4	K	568	ARG	N-CA-C	5.55	117.41	111.36
4	K	250	ARG	N-CA-C	-5.52	106.75	112.93
4	K	563	ASP	N-CA-C	-5.51	105.28	111.28
4	K	463	ARG	N-CA-C	-5.48	105.31	111.28
4	L	225	VAL	N-CA-C	-5.45	104.23	111.05
4	K	349	PHE	N-CA-C	-5.43	105.26	111.07
2	C	200	PHE	N-CA-C	-5.41	101.06	109.24
4	K	46	MET	CA-C-N	-5.38	114.71	122.36
4	K	46	MET	C-N-CA	-5.38	114.71	122.36
4	K	253	LYS	N-CA-C	-5.38	100.83	109.39

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	E	366	GLY	N-CA-C	5.37	119.41	112.54
4	L	351	SER	N-CA-C	-5.35	105.45	111.28
2	C	173	TYR	N-CA-C	-5.34	105.46	111.28
4	L	579	ILE	N-CA-C	-5.33	100.80	108.42
4	L	216	GLY	N-CA-C	-5.30	108.84	114.67
4	K	425	ALA	N-CA-C	5.29	121.55	113.51
3	E	377	ASP	N-CA-C	5.25	121.97	110.80
4	L	247	GLY	N-CA-C	-5.24	100.66	110.77
4	K	59	ILE	N-CA-C	-5.21	105.31	110.62
4	K	438	GLU	N-CA-C	-5.21	105.59	112.94
2	C	162	MET	N-CA-C	-5.21	105.69	111.36
4	L	373	VAL	N-CA-C	5.19	115.91	110.62
4	L	572	ASP	N-CA-C	5.16	116.81	108.08
4	L	568	ARG	N-CA-C	5.15	116.90	111.28
4	K	201	PHE	N-CA-C	5.15	117.56	108.75
3	E	244	GLN	N-CA-C	5.14	117.11	109.25
3	E	433	GLN	N-CA-C	5.14	117.93	109.76
4	L	255	SER	N-CA-C	-5.13	102.19	110.14
4	L	251	SER	N-CA-C	5.12	116.86	111.28
4	K	330	LYS	N-CA-C	-5.12	100.17	108.52
2	B	150	ALA	N-CA-C	5.09	118.61	111.74
3	E	324	CYS	N-CA-C	5.05	116.47	111.07
4	K	351	SER	N-CA-C	-5.05	105.78	111.28
2	C	103	THR	N-CA-C	5.03	117.10	108.90
4	L	182	VAL	N-CA-C	5.03	119.53	113.00
4	K	96	ASP	CB-CA-C	-5.02	104.86	113.04

There are no chirality outliers.

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	153	0	138	8	0
2	B	1660	0	1637	72	0
2	C	1660	0	1637	53	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	E	4168	0	3979	177	0
4	K	4635	0	4634	113	0
4	L	4635	0	4634	107	0
All	All	16911	0	16659	499	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 15.

All (499) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:E:50:ASN:HB2	3:E:355:THR:OG1	1.57	1.04
2:C:41:VAL:HG11	2:C:69:ARG:HH22	1.34	0.92
3:E:222:SER:HB2	3:E:242:PRO:HA	1.53	0.90
3:E:50:ASN:CB	3:E:355:THR:OG1	2.21	0.89
4:K:425:ALA:HB3	4:K:427:GLN:NE2	1.89	0.87
4:L:182:VAL:HA	4:L:185:PHE:HE1	1.45	0.82
4:K:69:PHE:HB2	4:K:357:ARG:NH2	1.94	0.82
3:E:315:PRO:HA	3:E:324:CYS:HA	1.64	0.79
2:C:41:VAL:CG1	2:C:69:ARG:HH22	1.95	0.78
4:L:182:VAL:HA	4:L:185:PHE:CE1	2.19	0.77
2:B:1:MET:H3	2:B:6:LEU:HD21	1.51	0.76
4:K:69:PHE:HB2	4:K:357:ARG:CZ	2.16	0.75
3:E:72:TRP:HB2	3:E:83:VAL:HB	1.68	0.75
4:L:39:GLN:NE2	4:L:241:ARG:HA	2.02	0.75
3:E:416:GLU:HG2	3:E:496:ARG:HG3	1.66	0.74
2:B:106:PRO:HB3	2:B:118:ILE:HG21	1.69	0.74
3:E:223:ILE:HD13	3:E:241:PHE:HB2	1.69	0.74
3:E:34:LYS:NZ	3:E:35:PRO:O	2.20	0.73
3:E:345:LEU:HD11	3:E:389:TYR:HB3	1.71	0.73
3:E:222:SER:CB	3:E:242:PRO:HA	2.19	0.73
2:B:181:GLN:OE1	2:B:184:ARG:NH1	2.22	0.72
4:K:182:VAL:HA	4:K:185:PHE:HE1	1.55	0.72
4:K:520:ARG:HG2	4:K:556:LEU:HD11	1.71	0.71
4:L:520:ARG:HG2	4:L:556:LEU:HD11	1.71	0.71
4:L:440:ARG:HD2	4:L:517:PRO:HG2	1.71	0.71
3:E:154:ILE:HG13	3:E:155:LEU:HG	1.73	0.70
3:E:120:LEU:O	3:E:143:ARG:NH1	2.24	0.70
4:K:201:PHE:HB2	4:K:272:ILE:HD11	1.74	0.69
3:E:255:PHE:HB2	3:E:303:LYS:HE2	1.73	0.69
3:E:303:LYS:HG3	3:E:305:PRO:HD3	1.73	0.69

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:L:241:ARG:HB3	4:L:244:PRO:HD2	1.74	0.69
3:E:80:VAL:H	3:E:92:SER:HB3	1.57	0.69
4:L:194:CYS:SG	4:L:195:LYS:NZ	2.65	0.68
2:B:194:LEU:CD1	4:K:368:PRO:O	2.41	0.68
4:K:425:ALA:HB3	4:K:427:GLN:HE22	1.56	0.67
4:K:383:LYS:HB2	4:L:363:GLN:OE1	1.94	0.67
4:L:111:ARG:HG2	4:L:495:SER:O	1.94	0.67
2:B:184:ARG:HH21	2:C:38:GLN:HA	1.58	0.67
3:E:209:GLU:HB3	3:E:216:ILE:HD12	1.78	0.66
2:B:61:ILE:O	2:B:116:PHE:N	2.24	0.66
3:E:457:TYR:HB2	3:E:496:ARG:HB3	1.77	0.66
2:C:41:VAL:HG11	2:C:69:ARG:NH2	2.10	0.65
2:C:202:GLY:HA3	4:K:358:GLN:HE22	1.61	0.65
4:K:129:GLU:OE2	4:L:463:ARG:NH2	2.30	0.65
4:L:81:LEU:HD22	4:L:335:LEU:HD11	1.79	0.64
2:C:59:ASN:OD1	2:C:60:ARG:N	2.30	0.64
2:B:86:LYS:NZ	2:B:106:PRO:O	2.26	0.64
2:B:80:ARG:HH11	2:B:84:THR:HG23	1.63	0.63
2:C:10:ILE:HD12	2:C:159:ILE:HG13	1.79	0.63
3:E:210:GLU:CD	3:E:211:LEU:H	2.05	0.63
4:K:182:VAL:HA	4:K:185:PHE:CE1	2.33	0.63
4:K:81:LEU:HD22	4:K:335:LEU:HD11	1.79	0.63
3:E:56:GLU:OE1	3:E:346:LYS:NZ	2.32	0.63
3:E:259:HIS:HD2	3:E:271:ASP:HA	1.65	0.62
4:K:75:PRO:HB3	4:L:417:ILE:HD13	1.82	0.62
4:K:311:LEU:HD13	4:K:504:SER:HB3	1.82	0.62
2:B:44:PHE:CD1	2:B:145:PRO:HB2	2.35	0.62
2:B:80:ARG:NE	2:B:105:GLU:OE2	2.33	0.62
3:E:378:GLU:HB3	3:E:381:ALA:HB3	1.82	0.61
3:E:224:TRP:CE3	3:E:239:ASN:HB3	2.35	0.61
2:C:79:ARG:O	2:C:127:LYS:NZ	2.34	0.61
3:E:47:ARG:N	3:E:401:THR:OG1	2.33	0.61
3:E:461:LYS:HD3	3:E:492:LEU:HB2	1.82	0.61
4:L:311:LEU:HD13	4:L:504:SER:HB3	1.82	0.61
3:E:268:ILE:HA	3:E:277:SER:HA	1.83	0.61
3:E:53:PRO:HG3	3:E:57:LYS:HE3	1.82	0.61
4:L:95:ARG:HH22	4:L:514:GLY:HA3	1.66	0.61
4:L:80:GLN:HA	4:L:83:THR:HG22	1.83	0.61
4:L:183:TYR:HE2	4:L:240:TYR:HB3	1.65	0.61
3:E:407:ILE:HG13	3:E:408:ASP:H	1.66	0.60
3:E:40:TRP:HB2	3:E:506:LEU:HB3	1.83	0.60

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:K:80:GLN:HA	4:K:83:THR:HG22	1.83	0.60
3:E:206:VAL:HG22	3:E:207:THR:HG23	1.82	0.60
2:B:62:PRO:HA	2:B:115:TYR:HD1	1.67	0.60
3:E:417:ARG:NE	3:E:419:ASP:O	2.27	0.60
4:K:250:ARG:HH11	4:K:254:ASP:HB3	1.66	0.60
3:E:32:ASN:O	3:E:42:LYS:NZ	2.35	0.60
2:B:106:PRO:HA	2:B:120:PRO:HB2	1.83	0.60
3:E:293:SER:C	3:E:295:TYR:H	2.09	0.60
3:E:211:LEU:HD22	3:E:255:PHE:CD1	2.37	0.59
2:B:115:TYR:O	2:B:117:ARG:NH1	2.34	0.59
2:C:65:ARG:HE	2:C:138:THR:HG22	1.66	0.59
2:B:191:GLU:HG3	2:C:69:ARG:HD3	1.82	0.59
3:E:283:VAL:HG21	3:E:337:TRP:CD2	2.37	0.59
4:L:97:PRO:O	4:L:99:PHE:N	2.36	0.59
4:L:386:ARG:O	4:L:387:LEU:HB2	2.02	0.59
3:E:358:SER:HB3	3:E:374:TRP:HZ3	1.68	0.59
4:L:499:LYS:HB2	4:L:502:ASP:HB2	1.85	0.59
3:E:80:VAL:HG11	3:E:116:MET:HE1	1.85	0.59
3:E:415:TRP:HB3	3:E:497:ILE:HB	1.84	0.58
3:E:477:ASN:ND2	3:E:480:GLU:OE1	2.35	0.58
3:E:93:ARG:NH2	3:E:96:GLY:O	2.36	0.58
4:K:499:LYS:HB2	4:K:502:ASP:HB2	1.85	0.58
3:E:456:VAL:HG12	3:E:497:ILE:HD12	1.83	0.58
3:E:160:ASN:N	3:E:168:ASP:OD2	2.34	0.58
3:E:32:ASN:OD1	3:E:42:LYS:NZ	2.36	0.58
3:E:121:ASP:OD2	3:E:124:GLN:NE2	2.35	0.58
4:K:425:ALA:CB	4:K:427:GLN:HE22	2.16	0.58
4:K:425:ALA:CB	4:K:427:GLN:NE2	2.63	0.58
3:E:71:ARG:NE	3:E:84:GLU:OE1	2.33	0.58
4:K:566:LYS:HG2	4:L:544:TYR:CE1	2.39	0.58
3:E:145:ARG:HB3	3:E:159:VAL:HG21	1.84	0.58
4:L:432:SER:HB2	4:L:442:THR:HA	1.86	0.58
2:B:132:PHE:HZ	2:B:134:ARG:HE	1.52	0.57
4:K:151:TRP:CD2	4:K:476:LEU:HD23	2.39	0.57
3:E:3:VAL:HG23	3:E:513:TYR:HE1	1.69	0.57
4:L:151:TRP:CD2	4:L:476:LEU:HD23	2.39	0.57
2:B:73:GLU:HG3	2:C:92:SER:HB2	1.86	0.57
3:E:138:LEU:HD11	3:E:142:VAL:HG11	1.87	0.57
2:B:46:LEU:HD11	2:B:131:LEU:HD11	1.87	0.56
3:E:407:ILE:HG13	3:E:408:ASP:N	2.20	0.56
4:K:391:ILE:HD12	4:K:391:ILE:H	1.70	0.56

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:E:405:LEU:HD21	3:E:502:GLN:HE22	1.71	0.56
4:L:201:PHE:HB2	4:L:272:ILE:HD11	1.88	0.56
4:L:391:ILE:H	4:L:391:ILE:HD12	1.70	0.56
3:E:138:LEU:HD12	3:E:139:PRO:HD2	1.85	0.56
3:E:315:PRO:CA	3:E:324:CYS:HA	2.36	0.56
3:E:406:PHE:HB2	3:E:411:ILE:HD11	1.87	0.56
4:K:347:TRP:O	4:K:348:LEU:HB2	2.03	0.56
2:C:144:ASN:HD21	2:C:146:TRP:HB2	1.72	0.55
3:E:211:LEU:HA	3:E:216:ILE:HG22	1.89	0.55
3:E:309:GLU:OE2	3:E:331:ASN:ND2	2.40	0.55
4:K:74:MET:H	4:K:346:THR:HG22	1.70	0.55
4:K:158:GLN:NE2	4:L:308:VAL:O	2.39	0.55
3:E:124:GLN:HB3	3:E:132:LEU:HB3	1.89	0.55
4:K:355:ASN:OD1	4:K:356:LYS:N	2.39	0.55
3:E:48:GLU:HA	3:E:398:LEU:HG	1.88	0.54
3:E:209:GLU:HA	3:E:218:TYR:HB2	1.88	0.54
3:E:158:GLY:HA2	3:E:169:GLU:HA	1.88	0.54
3:E:481:ASP:OD1	3:E:482:LYS:N	2.40	0.54
3:E:173:SER:HA	3:E:182:PRO:HG3	1.88	0.54
3:E:398:LEU:HD21	3:E:407:ILE:HG22	1.88	0.54
4:K:479:VAL:HA	4:K:482:LYS:HB2	1.89	0.54
2:B:47:SER:OG	2:B:132:PHE:O	2.21	0.54
3:E:210:GLU:OE2	3:E:259:HIS:ND1	2.39	0.54
2:B:80:ARG:HD2	2:B:84:THR:HG23	1.90	0.54
4:L:479:VAL:HA	4:L:482:LYS:HB2	1.89	0.53
3:E:6:LYS:HD2	3:E:8:PHE:CZ	2.43	0.53
3:E:36:THR:OG1	3:E:39:GLY:O	2.23	0.53
4:K:129:GLU:HG3	4:K:130:PRO:HD3	1.90	0.53
3:E:22:LEU:HB3	3:E:26:ALA:HB3	1.91	0.53
3:E:34:LYS:N	3:E:41:GLU:O	2.35	0.53
4:L:129:GLU:HG3	4:L:130:PRO:HD3	1.90	0.53
4:L:223:PHE:C	4:L:225:VAL:N	2.62	0.53
3:E:224:TRP:HA	3:E:239:ASN:HA	1.90	0.53
3:E:446:PHE:O	3:E:482:LYS:NZ	2.32	0.53
2:B:7:VAL:HG13	2:B:24:ILE:HG21	1.91	0.52
2:C:202:GLY:CA	4:K:358:GLN:HE22	2.22	0.52
3:E:150:TYR:HE2	3:E:228:LEU:HD23	1.74	0.52
4:K:129:GLU:HA	4:K:132:LEU:HB2	1.90	0.52
4:L:77:SER:OG	4:L:342:ASN:OD1	2.27	0.52
3:E:31:PHE:O	3:E:33:VAL:HG23	2.10	0.52
3:E:64:SER:OG	3:E:66:ALA:O	2.27	0.52

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:E:42:LYS:HG2	3:E:504:PHE:HB3	1.91	0.52
4:L:440:ARG:HB3	4:L:517:PRO:HG2	1.90	0.52
3:E:263:THR:OG1	3:E:266:ASP:O	2.21	0.52
4:K:115:LEU:O	4:K:119:LEU:HG	2.09	0.52
4:K:342:ASN:O	4:K:346:THR:HG23	2.10	0.52
4:L:241:ARG:HD3	4:L:242:ARG:H	1.74	0.52
2:C:47:SER:HA	2:C:139:LEU:HD21	1.92	0.51
2:B:86:LYS:HZ2	2:B:88:LEU:HG	1.74	0.51
3:E:104:ARG:HB2	3:E:119:GLU:CD	2.35	0.51
4:L:115:LEU:O	4:L:119:LEU:HG	2.09	0.51
3:E:227:GLN:NE2	3:E:236:ARG:HB3	2.26	0.51
2:B:159:ILE:O	2:B:160:TRP:C	2.53	0.51
2:B:121:VAL:O	2:B:123:GLN:NE2	2.44	0.51
2:B:169:LYS:C	2:B:171:ALA:H	2.18	0.51
3:E:75:GLY:HA2	3:E:80:VAL:HA	1.91	0.51
4:L:61:LYS:HG2	4:L:66:ASP:HB2	1.93	0.51
3:E:249:LYS:HE2	3:E:297:GLU:HG2	1.92	0.51
4:K:573:ASP:O	4:K:574:GLN:C	2.54	0.51
3:E:217:VAL:HG12	3:E:225:THR:HA	1.91	0.50
4:K:484:LYS:O	4:K:486:ALA:N	2.44	0.50
2:B:10:ILE:HD12	2:B:159:ILE:HG13	1.92	0.50
3:E:209:GLU:HA	3:E:218:TYR:CB	2.41	0.50
3:E:219:LYS:HB3	3:E:223:ILE:HA	1.94	0.50
2:B:61:ILE:HB	2:B:116:PHE:HB2	1.94	0.50
3:E:121:ASP:OD1	3:E:122:SER:N	2.45	0.50
3:E:160:ASN:CG	3:E:161:PHE:H	2.20	0.50
4:L:39:GLN:HE21	4:L:241:ARG:NE	2.10	0.50
3:E:7:GLN:HG3	3:E:25:GLY:HA2	1.93	0.50
3:E:214:MET:SD	3:E:215:ASN:HB2	2.51	0.50
3:E:307:VAL:O	3:E:309:GLU:N	2.43	0.50
4:K:355:ASN:ND2	4:K:400:THR:OG1	2.44	0.50
4:L:332:ARG:HH11	4:L:337:ILE:HG12	1.74	0.50
3:E:59:PHE:CD2	3:E:105:TRP:HB2	2.47	0.50
2:B:182:MET:O	2:B:185:LEU:HG	2.12	0.50
4:K:278:PRO:HG2	4:K:286:SER:HB3	1.94	0.50
2:C:71:TYR:CD2	2:C:131:LEU:HD23	2.47	0.50
3:E:308:ALA:HA	3:E:332:TRP:CZ2	2.46	0.50
4:K:414:MET:HA	4:K:417:ILE:HG22	1.94	0.50
2:C:140:ASN:O	2:C:141:VAL:C	2.54	0.49
3:E:78:LYS:HA	3:E:97:TYR:H	1.75	0.49
4:K:74:MET:HE2	4:K:74:MET:HA	1.93	0.49

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:K:404:ILE:O	4:K:408:GLN:HG3	2.12	0.49
4:K:518:VAL:HG12	4:K:520:ARG:HD2	1.94	0.49
4:L:414:MET:HA	4:L:417:ILE:HG22	1.94	0.49
1:A:8:LYS:HZ1	1:A:10:VAL:HB	1.78	0.49
2:C:31:SER:HB2	2:C:157:GLU:CD	2.38	0.49
3:E:3:VAL:HG23	3:E:513:TYR:CE1	2.48	0.49
3:E:45:GLY:O	3:E:401:THR:N	2.45	0.49
2:B:1:MET:H2	2:B:6:LEU:HD11	1.78	0.49
2:C:20:GLN:O	2:C:24:ILE:HG12	2.13	0.49
4:K:245:SER:O	4:K:248:GLN:HB3	2.12	0.49
4:K:340:PRO:O	4:K:344:ILE:HD12	2.13	0.49
4:L:518:VAL:HG12	4:L:520:ARG:HD2	1.94	0.49
2:B:194:LEU:HD13	4:K:368:PRO:O	2.12	0.49
3:E:142:VAL:HB	3:E:144:PHE:HE1	1.76	0.49
4:L:74:MET:HE2	4:L:74:MET:HA	1.93	0.49
3:E:479:MET:HE2	3:E:479:MET:HA	1.95	0.49
2:B:6:LEU:O	2:B:10:ILE:HG12	2.13	0.49
2:B:96:LEU:HB3	2:B:119:TYR:CD2	2.46	0.49
3:E:110:PHE:CG	3:E:154:ILE:HD13	2.48	0.49
3:E:350:TYR:HA	3:E:387:LEU:HA	1.94	0.49
4:L:182:VAL:CA	4:L:185:PHE:HE1	2.22	0.48
4:L:95:ARG:NH2	4:L:514:GLY:HA3	2.27	0.48
3:E:300:PHE:CZ	3:E:347:HIS:HA	2.49	0.48
3:E:455:ASP:HA	3:E:475:THR:HB	1.95	0.48
3:E:62:PHE:HE2	3:E:352:TYR:CD2	2.32	0.48
4:K:539:VAL:HG23	4:K:540:LEU:HD12	1.94	0.48
4:K:571:ASP:O	4:K:574:GLN:HB2	2.12	0.48
4:L:404:ILE:O	4:L:408:GLN:HG3	2.12	0.48
3:E:98:THR:HG21	3:E:120:LEU:HB2	1.95	0.48
4:L:539:VAL:HG23	4:L:540:LEU:HD12	1.94	0.48
2:C:154:LEU:HD13	2:C:154:LEU:HA	1.65	0.48
2:B:59:ASN:O	2:B:117:ARG:HA	2.14	0.48
2:C:2:ASP:C	2:C:4:ALA:H	2.22	0.48
3:E:31:PHE:HB2	3:E:414:VAL:HB	1.94	0.48
4:L:454:ALA:O	4:L:455:TYR:C	2.56	0.48
3:E:33:VAL:HG12	3:E:40:TRP:HE3	1.78	0.48
3:E:209:GLU:CD	3:E:218:TYR:HB3	2.39	0.47
3:E:436:GLU:O	3:E:519:MET:N	2.47	0.47
2:B:21:ASP:HA	2:B:24:ILE:HB	1.95	0.47
4:K:566:LYS:HG2	4:L:544:TYR:HE1	1.77	0.47
4:L:112:GLU:O	4:L:116:GLU:HG3	2.14	0.47

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:L:332:ARG:HG3	4:L:336:GLU:HB3	1.95	0.47
2:B:152:GLU:HG3	2:C:34:ARG:HG3	1.96	0.47
2:C:43:TRP:H	2:C:43:TRP:CD1	2.32	0.47
2:C:90:LYS:HB3	2:C:109:TYR:CE2	2.50	0.47
3:E:14:LEU:HD22	3:E:17:GLN:HE21	1.78	0.47
4:K:564:LYS:HB3	4:K:564:LYS:HE2	1.55	0.47
3:E:35:PRO:HG3	3:E:40:TRP:CZ3	2.49	0.47
4:L:241:ARG:CB	4:L:244:PRO:HD2	2.42	0.47
2:C:202:GLY:HA3	4:K:358:GLN:NE2	2.29	0.47
3:E:330:TRP:HB2	3:E:337:TRP:CE3	2.50	0.47
4:K:17:LEU:O	4:K:21:LEU:HD23	2.15	0.47
4:K:181:MET:O	4:K:185:PHE:HD1	1.98	0.47
4:K:528:MET:HE1	4:K:550:PHE:HE1	1.79	0.47
2:B:4:ALA:O	2:B:8:LYS:HE3	2.15	0.47
2:B:143:ASP:OD1	2:B:143:ASP:N	2.46	0.47
3:E:378:GLU:O	3:E:381:ALA:N	2.48	0.47
1:A:3:TRP:CE2	2:B:64:PRO:HG3	2.50	0.47
2:B:17:VAL:HG13	2:B:20:GLN:OE1	2.15	0.47
2:C:90:LYS:HD2	2:C:109:TYR:CE2	2.49	0.47
4:L:210:VAL:HG22	4:L:265:GLY:H	1.80	0.47
3:E:443:SER:HG	3:E:512:THR:HG1	1.63	0.47
4:K:318:HIS:NE2	4:K:465:LEU:HA	2.29	0.47
4:K:425:ALA:HB1	4:K:427:GLN:OE1	2.15	0.47
4:K:456:PHE:O	4:K:460:THR:HG22	2.15	0.47
4:L:91:VAL:O	4:L:95:ARG:NH2	2.48	0.47
2:C:97:LEU:HD13	2:C:97:LEU:HA	1.77	0.46
4:L:459:VAL:HG22	4:L:463:ARG:HH21	1.81	0.46
2:B:1:MET:H2	2:B:147:TYR:HB3	1.81	0.46
2:B:91:LYS:HB2	2:B:96:LEU:HG	1.97	0.46
4:K:554:ALA:HB3	4:K:562:ILE:HG21	1.96	0.46
2:B:201:MET:O	2:B:202:GLY:C	2.58	0.46
2:C:31:SER:HB2	2:C:157:GLU:OE2	2.15	0.46
3:E:417:ARG:HG2	3:E:420:ILE:HG13	1.96	0.46
2:B:76:LEU:HD12	2:B:109:TYR:CE1	2.51	0.46
4:K:276:LEU:HB2	4:K:281:TRP:CD1	2.51	0.46
1:A:14:TRP:CZ2	2:C:64:PRO:HG3	2.51	0.46
3:E:181:MET:SD	3:E:181:MET:N	2.88	0.46
4:K:44:TYR:C	4:K:47:MET:H	2.24	0.46
4:L:114:ALA:O	4:L:118:MET:HG3	2.16	0.46
2:B:41:VAL:HG11	2:B:133:TYR:CD2	2.50	0.46
2:C:6:LEU:HD22	2:C:28:LEU:HD22	1.98	0.46

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:E:377:ASP:C	3:E:379:ASP:H	2.23	0.46
2:C:38:GLN:HG3	2:C:39:GLU:H	1.80	0.46
3:E:477:ASN:HB3	3:E:480:GLU:OE2	2.15	0.46
4:K:46:MET:O	4:K:47:MET:C	2.57	0.46
4:K:380:GLU:HG3	4:K:383:LYS:HE2	1.97	0.46
4:L:528:MET:HE1	4:L:550:PHE:HE1	1.79	0.46
2:B:65:ARG:NH2	2:B:138:THR:HG22	2.30	0.46
3:E:125:TYR:CE2	3:E:127:ALA:HB2	2.51	0.46
4:K:359:ILE:HG23	4:K:360:MET:HG2	1.98	0.46
2:C:1:MET:HG2	2:C:5:THR:OG1	2.16	0.45
4:K:11:SER:C	4:K:13:HIS:N	2.68	0.45
4:L:374:LYS:O	4:L:377:GLU:HG3	2.16	0.45
1:A:3:TRP:NE1	2:B:64:PRO:HG3	2.31	0.45
1:A:5:ARG:HH11	2:B:140:ASN:HB3	1.80	0.45
4:K:275:ARG:HA	4:K:290:GLU:O	2.15	0.45
2:B:201:MET:HE3	2:B:201:MET:HB3	1.72	0.45
4:K:114:ALA:O	4:K:118:MET:HG3	2.15	0.45
4:K:483:VAL:HG23	4:K:575:ILE:HG23	1.99	0.45
2:B:48:GLU:OE2	2:C:60:ARG:NH1	2.49	0.45
2:B:188:LEU:HD13	2:C:39:GLU:HA	1.98	0.45
3:E:253:VAL:HG11	3:E:259:HIS:HB3	1.99	0.45
4:L:112:GLU:OE2	4:L:520:ARG:NH2	2.49	0.45
4:L:318:HIS:NE2	4:L:465:LEU:HA	2.32	0.45
4:L:412:ARG:NH1	4:L:412:ARG:HG3	2.32	0.45
3:E:126:LEU:HD13	3:E:132:LEU:HD22	1.97	0.45
3:E:229:ILE:HD12	3:E:229:ILE:H	1.81	0.45
4:L:20:LEU:HD21	4:L:294:PHE:CD2	2.52	0.45
4:L:332:ARG:HG2	4:L:337:ILE:HG13	1.99	0.45
2:B:10:ILE:HD11	2:B:155:VAL:HA	1.99	0.45
2:B:16:ASN:HB3	3:E:483:ARG:HH21	1.82	0.45
2:C:31:SER:HB2	2:C:157:GLU:OE1	2.17	0.45
1:A:8:LYS:NZ	1:A:10:VAL:HB	2.32	0.45
4:K:347:TRP:CG	4:K:348:LEU:H	2.35	0.45
4:L:26:LEU:HG	4:L:189:PRO:HG2	1.99	0.45
4:L:55:ASP:O	4:L:59:ILE:HG12	2.17	0.45
2:B:169:LYS:C	2:B:171:ALA:N	2.75	0.45
2:C:61:ILE:HB	2:C:116:PHE:HB2	1.99	0.45
3:E:34:LYS:O	3:E:41:GLU:N	2.42	0.45
3:E:262:VAL:HG23	3:E:267:ILE:HD12	1.97	0.45
4:L:448:SER:C	4:L:450:LEU:H	2.25	0.45
2:B:153:LEU:HD22	2:B:181:GLN:HB3	2.00	0.44

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:E:142:VAL:HA	3:E:161:PHE:HB2	1.99	0.44
4:K:75:PRO:CB	4:L:417:ILE:HD13	2.47	0.44
3:E:314:TYR:HA	3:E:315:PRO:HD3	1.87	0.44
4:L:494:GLN:HE21	4:L:494:GLN:HB2	1.59	0.44
2:B:86:LYS:NZ	2:B:107:SER:HA	2.33	0.44
2:C:144:ASN:ND2	2:C:146:TRP:HB2	2.32	0.44
3:E:41:GLU:OE2	3:E:505:ILE:HG12	2.16	0.44
3:E:138:LEU:HD12	3:E:139:PRO:CD	2.47	0.44
4:K:341:MET:HE1	4:K:413:ASN:HB3	1.99	0.44
4:K:454:ALA:O	4:K:455:TYR:C	2.59	0.44
3:E:253:VAL:HA	3:E:260:PHE:O	2.18	0.44
4:L:342:ASN:O	4:L:342:ASN:ND2	2.50	0.44
4:L:573:ASP:O	4:L:574:GLN:C	2.57	0.44
4:L:196:TYR:CE1	4:L:319:ILE:HB	2.52	0.44
2:B:46:LEU:HD23	2:C:113:ASN:HB2	1.98	0.44
3:E:146:THR:HG21	3:E:207:THR:HA	2.00	0.44
3:E:147:VAL:HA	3:E:157:LEU:HB3	1.99	0.44
3:E:463:SER:HB3	3:E:521:ALA:C	2.42	0.44
4:K:534:VAL:HG22	4:K:540:LEU:HD23	1.99	0.44
4:L:478:THR:O	4:L:482:LYS:N	2.45	0.44
3:E:49:THR:HG23	3:E:51:THR:HG22	2.00	0.44
3:E:125:TYR:HE2	3:E:127:ALA:HB2	1.82	0.44
4:K:412:ARG:NH1	4:K:412:ARG:HG3	2.32	0.44
2:C:79:ARG:HB3	2:C:127:LYS:HZ3	1.83	0.44
3:E:457:TYR:HD2	3:E:496:ARG:NH1	2.16	0.44
2:B:14:MET:HE1	2:B:162:MET:HG3	1.99	0.43
4:L:223:PHE:C	4:L:225:VAL:H	2.25	0.43
4:L:412:ARG:HG3	4:L:412:ARG:HH11	1.83	0.43
2:B:72:GLU:C	2:B:74:GLY:H	2.26	0.43
3:E:248:ASN:ND2	3:E:296:PHE:O	2.51	0.43
3:E:251:SER:HB2	3:E:262:VAL:CG1	2.47	0.43
4:K:76:TYR:HD1	4:L:416:ARG:HH11	1.65	0.43
4:L:175:CYS:SG	4:L:472:LYS:HD2	2.58	0.43
2:C:30:LEU:O	2:C:33:GLU:HG3	2.19	0.43
3:E:224:TRP:CD2	3:E:239:ASN:HB3	2.52	0.43
3:E:293:SER:C	3:E:295:TYR:N	2.76	0.43
4:K:385:ILE:H	4:K:385:ILE:HG12	1.45	0.43
4:L:341:MET:HE1	4:L:413:ASN:HB3	1.99	0.43
3:E:4:THR:HA	3:E:510:LYS:HA	2.00	0.43
4:L:197:GLN:NE2	4:L:314:LYS:HB3	2.34	0.43
4:K:149:ASP:HB3	4:K:177:THR:HG22	2.00	0.43

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:K:405:GLN:OE1	4:K:405:GLN:HA	2.19	0.43
4:K:578:LEU:HD22	4:K:578:LEU:HA	1.78	0.43
4:K:484:LYS:HB3	4:L:507:PHE:HE2	1.83	0.43
4:L:534:VAL:HG22	4:L:540:LEU:HD23	1.99	0.43
3:E:477:ASN:HD21	3:E:479:MET:HB3	1.83	0.43
4:K:111:ARG:HG2	4:K:495:SER:HA	2.01	0.43
4:K:175:CYS:SG	4:K:472:LYS:HD2	2.59	0.43
4:K:348:LEU:HD13	4:K:348:LEU:HA	1.93	0.43
4:L:20:LEU:HD21	4:L:294:PHE:HD2	1.84	0.43
4:L:448:SER:HB2	4:L:450:LEU:HB2	2.00	0.43
4:L:482:LYS:HD2	4:L:496:ILE:HD12	1.99	0.43
2:C:141:VAL:O	2:C:142:GLU:C	2.62	0.43
2:C:163:LEU:HD12	2:C:163:LEU:HA	1.90	0.43
3:E:6:LYS:HD2	3:E:8:PHE:HZ	1.84	0.43
3:E:91:VAL:O	3:E:132:LEU:HD23	2.19	0.43
3:E:266:ASP:HB2	3:E:268:ILE:HD11	1.99	0.43
4:K:77:SER:HA	4:K:80:GLN:OE1	2.19	0.43
4:L:149:ASP:HB3	4:L:177:THR:HG22	2.00	0.43
3:E:37:ILE:HD12	3:E:37:ILE:H	1.83	0.43
3:E:458:ILE:N	3:E:471:GLU:O	2.46	0.43
3:E:480:GLU:OE1	3:E:480:GLU:N	2.51	0.43
2:C:38:GLN:HG3	2:C:39:GLU:N	2.34	0.43
3:E:211:LEU:HD21	3:E:254:SER:O	2.19	0.43
4:K:386:ARG:O	4:K:387:LEU:HB2	2.19	0.43
4:L:405:GLN:OE1	4:L:405:GLN:HA	2.18	0.43
2:C:160:TRP:NE1	2:C:164:SER:OG	2.52	0.42
4:K:580:LEU:H	4:K:580:LEU:HG	1.35	0.42
4:L:25:ASP:O	4:L:26:LEU:C	2.59	0.42
4:L:52:ASN:OD1	4:L:53:LYS:N	2.51	0.42
2:B:10:ILE:O	2:B:14:MET:HG2	2.19	0.42
2:C:79:ARG:HB3	2:C:127:LYS:NZ	2.34	0.42
4:K:365:ILE:HG12	4:K:394:LEU:HD21	2.01	0.42
4:K:478:THR:O	4:K:482:LYS:N	2.44	0.42
4:L:241:ARG:HD3	4:L:242:ARG:N	2.34	0.42
4:L:350:ASP:O	4:L:351:SER:C	2.58	0.42
1:A:14:TRP:HH2	2:C:130:LEU:HD13	1.83	0.42
2:B:61:ILE:N	2:B:116:PHE:O	2.42	0.42
2:B:77:TYR:HE1	2:B:85:GLY:HA3	1.84	0.42
4:K:342:ASN:O	4:K:342:ASN:ND2	2.50	0.42
3:E:187:TYR:CG	3:E:188:ALA:N	2.87	0.42
3:E:214:MET:SD	3:E:215:ASN:N	2.92	0.42

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:E:422:ILE:HG12	3:E:439:LYS:HZ3	1.84	0.42
3:E:444:ILE:HD12	3:E:446:PHE:CZ	2.54	0.42
4:K:412:ARG:HG3	4:K:412:ARG:HH11	1.84	0.42
4:L:295:THR:O	4:L:302:ILE:HG13	2.19	0.42
4:L:365:ILE:HG12	4:L:394:LEU:HD21	2.01	0.42
2:B:184:ARG:HH21	2:C:38:GLN:CA	2.29	0.42
2:C:144:ASN:HB3	2:C:147:TYR:CD2	2.54	0.42
2:B:115:TYR:HB2	2:B:117:ARG:NH1	2.34	0.42
2:C:14:MET:HE2	2:C:159:ILE:HG12	2.02	0.42
3:E:101:ALA:HA	3:E:104:ARG:HD3	2.01	0.42
4:K:291:MET:HE3	4:K:308:VAL:HG11	2.01	0.42
4:K:357:ARG:NH1	4:L:347:TRP:CE2	2.86	0.42
4:L:566:LYS:HD3	4:L:566:LYS:HA	1.71	0.42
3:E:45:GLY:HA3	3:E:403:GLN:O	2.19	0.42
4:K:76:TYR:CD1	4:L:416:ARG:NH1	2.87	0.42
4:K:181:MET:HE3	4:K:181:MET:HB3	1.69	0.42
4:K:488:ASP:O	4:K:555:ARG:NH1	2.52	0.42
2:B:152:GLU:O	2:B:153:LEU:C	2.58	0.42
4:K:77:SER:OG	4:K:342:ASN:OD1	2.35	0.42
4:K:195:LYS:H	4:K:195:LYS:HG2	1.59	0.42
4:K:568:ARG:H	4:K:568:ARG:HG2	1.45	0.42
3:E:378:GLU:O	3:E:379:ASP:C	2.63	0.42
4:K:55:ASP:O	4:K:59:ILE:HG12	2.20	0.42
2:C:160:TRP:NE1	2:C:164:SER:HG	2.18	0.42
3:E:42:LYS:HA	3:E:42:LYS:HD2	1.78	0.42
3:E:284:ARG:NH2	3:E:285:ASN:OD1	2.43	0.42
4:L:214:LYS:O	4:L:217:ALA:HB3	2.19	0.42
2:B:1:MET:N	2:B:6:LEU:HD11	2.33	0.41
2:B:202:GLY:HA3	4:L:358:GLN:HE22	1.84	0.41
4:K:202:PHE:HD2	4:K:317:PHE:CD2	2.38	0.41
4:L:276:LEU:O	4:L:290:GLU:N	2.51	0.41
4:L:279:LYS:HE2	4:L:285:ASP:HA	2.01	0.41
1:A:8:LYS:HZ3	1:A:10:VAL:H	1.68	0.41
2:B:169:LYS:O	2:B:171:ALA:N	2.54	0.41
3:E:34:LYS:HA	3:E:34:LYS:HD2	1.90	0.41
3:E:58:ASP:OD2	3:E:103:ALA:N	2.52	0.41
3:E:223:ILE:HD11	3:E:244:GLN:HB2	2.01	0.41
4:K:318:HIS:CD2	4:K:465:LEU:HA	2.55	0.41
4:L:279:LYS:HD3	4:L:279:LYS:HA	1.79	0.41
2:C:69:ARG:HG2	2:C:70:GLU:N	2.35	0.41
3:E:2:GLU:OE1	3:E:2:GLU:N	2.54	0.41

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:E:259:HIS:HB2	3:E:270:HIS:O	2.20	0.41
4:K:295:THR:O	4:K:302:ILE:HG13	2.19	0.41
4:K:345:LEU:HD11	4:K:411:GLU:HG3	2.01	0.41
4:K:206:LEU:HD22	4:K:271:GLU:HG2	2.03	0.41
2:B:115:TYR:HB2	2:B:117:ARG:HH12	1.86	0.41
2:C:79:ARG:NH2	2:C:129:GLU:OE2	2.39	0.41
3:E:291:MET:HB2	3:E:317:LYS:HE2	2.02	0.41
3:E:311:TYR:HD1	3:E:329:VAL:HG22	1.86	0.41
4:L:299:LYS:HA	4:L:299:LYS:HD3	1.96	0.41
4:L:399:VAL:HG23	4:L:400:THR:HG23	2.02	0.41
2:C:38:GLN:HG3	2:C:39:GLU:OE1	2.20	0.41
3:E:104:ARG:NH2	3:E:120:LEU:HD21	2.35	0.41
3:E:182:PRO:HA	3:E:183:PRO:HD3	1.98	0.41
3:E:227:GLN:O	3:E:235:PHE:HA	2.20	0.41
3:E:437:ARG:HG3	3:E:518:GLU:OE2	2.21	0.41
3:E:449:ASP:HB2	3:E:505:ILE:HG21	2.01	0.41
3:E:457:TYR:N	3:E:496:ARG:O	2.34	0.41
4:L:206:LEU:HD22	4:L:271:GLU:HG2	2.03	0.41
4:L:342:ASN:C	4:L:342:ASN:HD22	2.27	0.41
4:L:348:LEU:HD21	4:L:406:ASP:HB3	2.03	0.41
2:B:35:LEU:HD13	2:B:35:LEU:HA	1.82	0.41
3:E:51:THR:HG21	3:E:397:LEU:HD12	2.03	0.41
3:E:228:LEU:HA	3:E:235:PHE:HA	2.03	0.41
3:E:248:ASN:O	3:E:251:SER:OG	2.29	0.41
4:K:446:ALA:O	4:K:447:SER:C	2.62	0.41
4:L:39:GLN:HE22	4:L:240:TYR:C	2.29	0.41
4:L:202:PHE:HD2	4:L:317:PHE:CD2	2.38	0.41
2:C:132:PHE:HE2	2:C:134:ARG:HG3	1.86	0.41
3:E:199:LEU:HD21	3:E:224:TRP:CD1	2.55	0.41
3:E:446:PHE:HE2	3:E:456:VAL:HG11	1.86	0.41
4:K:450:LEU:HD23	4:K:450:LEU:HA	1.72	0.41
4:L:236:LYS:HE3	4:L:239:MET:HG2	2.03	0.41
4:L:483:VAL:HG11	4:L:576:LEU:HG	2.02	0.41
2:B:46:LEU:HA	2:B:133:TYR:HD1	1.86	0.41
3:E:222:SER:HB3	3:E:242:PRO:O	2.21	0.41
2:B:136:SER:HA	2:B:139:LEU:HD23	2.03	0.40
4:K:341:MET:O	4:K:345:LEU:HD23	2.21	0.40
4:K:347:TRP:CG	4:K:348:LEU:N	2.89	0.40
4:K:399:VAL:HG23	4:K:400:THR:HG23	2.02	0.40
4:K:575:ILE:HD12	4:K:575:ILE:HA	1.91	0.40
4:L:403:ASN:O	4:L:407:VAL:HG23	2.21	0.40

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:44:PHE:CE1	2:B:146:TRP:HA	2.56	0.40
2:B:193:ARG:HE	2:B:194:LEU:HG	1.86	0.40
3:E:223:ILE:CD1	3:E:241:PHE:HB2	2.46	0.40
3:E:240:LYS:HD3	3:E:240:LYS:HA	1.88	0.40
3:E:282:ARG:NH2	3:E:335:ASP:OD1	2.38	0.40
3:E:441:VAL:HG12	3:E:493:PHE:CE2	2.57	0.40
4:K:403:ASN:O	4:K:407:VAL:HG23	2.21	0.40
4:L:496:ILE:HD13	4:L:496:ILE:HA	1.85	0.40
3:E:325:ASP:OD1	3:E:344:PRO:HA	2.21	0.40
3:E:438:ASN:HD22	3:E:438:ASN:HA	1.57	0.40
4:K:106:GLY:C	4:K:109:THR:H	2.30	0.40
4:K:497:ILE:HD11	4:K:579:ILE:HG23	2.04	0.40
3:E:186:ASP:OD2	3:E:189:ASN:HB3	2.21	0.40
4:K:39:GLN:NE2	4:K:240:TYR:HA	2.36	0.40
4:K:132:LEU:HD13	4:K:132:LEU:HA	1.91	0.40
4:K:236:LYS:HE2	4:K:236:LYS:HB3	1.98	0.40
4:L:64:LYS:HD3	4:L:64:LYS:HA	1.73	0.40
4:L:110:GLU:OE1	4:L:494:GLN:HB2	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	17/239 (7%)	16 (94%)	1 (6%)	0	100	100
2	B	200/202 (99%)	182 (91%)	16 (8%)	2 (1%)	13	49
2	C	200/202 (99%)	188 (94%)	11 (6%)	1 (0%)	25	64
3	E	519/521 (100%)	457 (88%)	58 (11%)	4 (1%)	16	55
4	K	579/581 (100%)	544 (94%)	33 (6%)	2 (0%)	37	73
4	L	579/581 (100%)	543 (94%)	27 (5%)	9 (2%)	8	38

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
All	All	2094/2326 (90%)	1930 (92%)	146 (7%)	18 (1%)	17 51

All (18) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	100	GLU
2	B	170	MET
2	C	141	VAL
3	E	379	ASP
4	L	387	LEU
4	L	440	ARG
3	E	376	ALA
3	E	377	ASP
4	L	244	PRO
4	L	360	MET
3	E	378	GLU
4	K	286	SER
4	K	387	LEU
4	L	224	ASN
4	L	437	THR
4	L	442	THR
4	L	187	PRO
4	L	98	ILE

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	A	17/208 (8%)	17 (100%)	0	100 100
2	B	175/175 (100%)	169 (97%)	6 (3%)	32 51
2	C	175/175 (100%)	157 (90%)	18 (10%)	6 20
3	E	447/447 (100%)	438 (98%)	9 (2%)	50 68
4	K	505/505 (100%)	468 (93%)	37 (7%)	11 31
4	L	505/505 (100%)	473 (94%)	32 (6%)	15 36

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
All	All	1824/2015 (90%)	1722 (94%)	102 (6%)	20 38

All (102) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	B	35	LEU
2	B	38	GLN
2	B	92	SER
2	B	154	LEU
2	B	157	GLU
2	B	199	ILE
2	C	22	THR
2	C	25	ASP
2	C	30	LEU
2	C	32	ILE
2	C	35	LEU
2	C	45	LEU
2	C	46	LEU
2	C	73	GLU
2	C	88	LEU
2	C	97	LEU
2	C	100	GLU
2	C	102	MET
2	C	111	LEU
2	C	134	ARG
2	C	154	LEU
2	C	159	ILE
2	C	170	MET
2	C	188	LEU
3	E	355	THR
3	E	357	VAL
3	E	358	SER
3	E	365	VAL
3	E	377	ASP
3	E	425	ILE
3	E	436	GLU
3	E	438	ASN
3	E	439	LYS
4	K	1	MET
4	K	3	ILE
4	K	36	THR
4	K	60	GLU

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
4	K	93	LEU
4	K	104	LEU
4	K	132	LEU
4	K	137	MET
4	K	181	MET
4	K	182	VAL
4	K	191	VAL
4	K	194	CYS
4	K	195	LYS
4	K	197	GLN
4	K	246	ILE
4	K	248	GLN
4	K	250	ARG
4	K	252	LEU
4	K	263	GLN
4	K	264	VAL
4	K	283	LEU
4	K	348	LEU
4	K	372	VAL
4	K	376	VAL
4	K	385	ILE
4	K	422	ASP
4	K	427	GLN
4	K	434	ARG
4	K	437	THR
4	K	439	PHE
4	K	443	THR
4	K	453	LEU
4	K	564	LYS
4	K	568	ARG
4	K	570	LEU
4	K	578	LEU
4	K	580	LEU
4	L	21	LEU
4	L	23	ARG
4	L	36	THR
4	L	41	THR
4	L	137	MET
4	L	229	GLU
4	L	231	LEU
4	L	240	TYR
4	L	241	ARG

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
4	L	243	ASP
4	L	248	GLN
4	L	249	GLN
4	L	252	LEU
4	L	255	SER
4	L	256	THR
4	L	283	LEU
4	L	350	ASP
4	L	371	LEU
4	L	427	GLN
4	L	438	GLU
4	L	439	PHE
4	L	443	THR
4	L	450	LEU
4	L	453	LEU
4	L	489	ASN
4	L	494	GLN
4	L	496	ILE
4	L	498	VAL
4	L	567	ILE
4	L	568	ARG
4	L	579	ILE
4	L	580	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (21) such sidechains are listed below:

Mol	Chain	Res	Type
2	B	38	GLN
2	C	108	HIS
2	C	197	GLN
3	E	55	ASN
3	E	433	GLN
3	E	438	ASN
3	E	502	GLN
4	K	34	ASN
4	K	85	HIS
4	K	100	GLN
4	K	105	ASN
4	K	120	GLN
4	K	157	HIS
4	K	179	ASN
4	K	248	GLN

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
4	K	358	GLN
4	L	34	ASN
4	L	39	GLN
4	L	85	HIS
4	L	248	GLN
4	L	494	GLN

5.3.3 RNA

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates

There are no oligosaccharides in this entry.

5.6 Ligand geometry

There are no ligands in this entry.

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

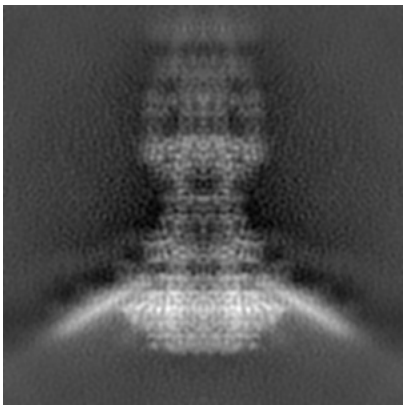
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-60199. These allow visual inspection of the internal detail of the map and identification of artifacts.

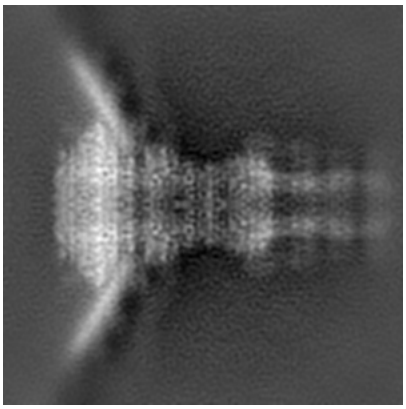
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

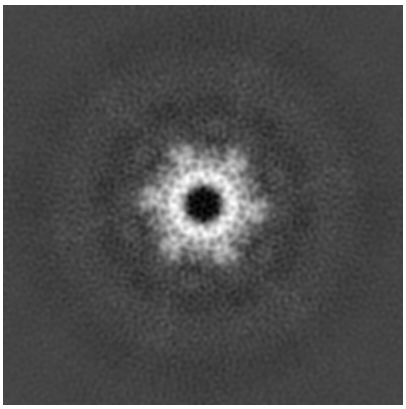
6.1.1 Primary map



X

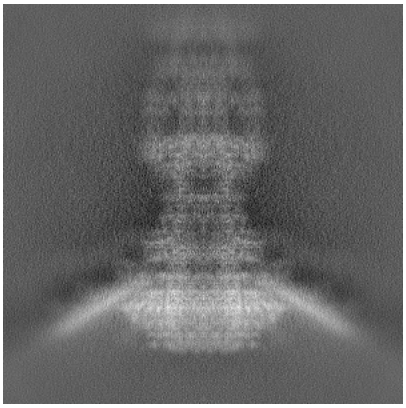


Y

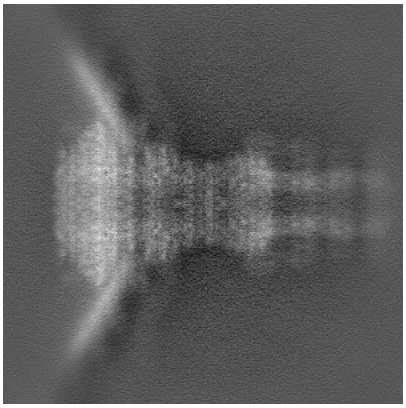


Z

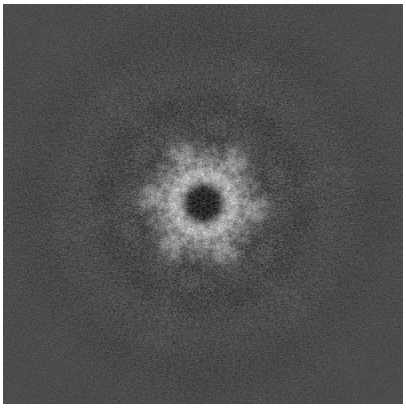
6.1.2 Raw map



X



Y

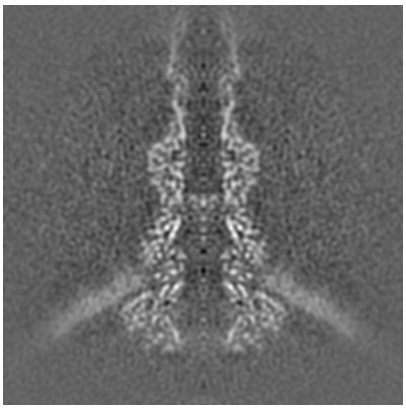


Z

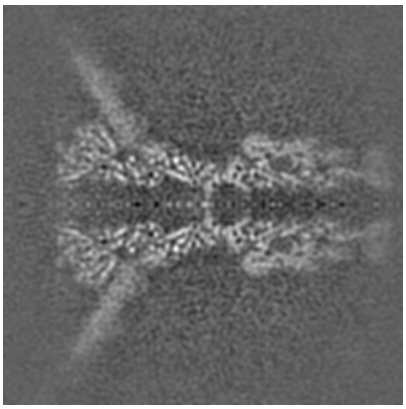
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

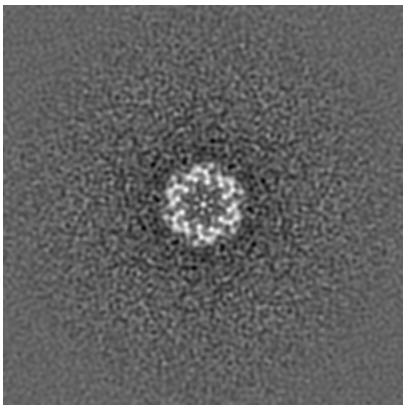
6.2.1 Primary map



X Index: 200

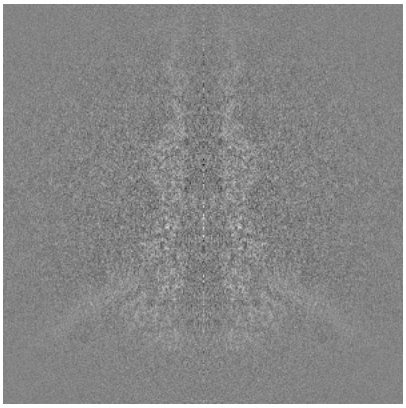


Y Index: 200

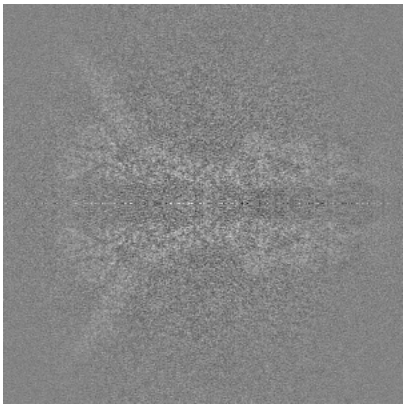


Z Index: 200

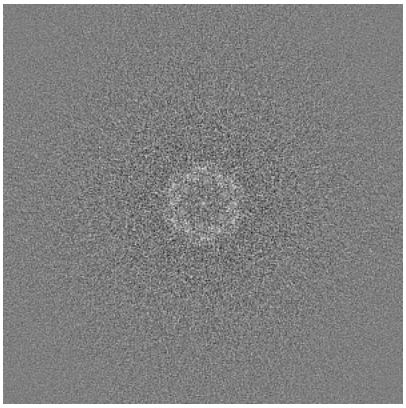
6.2.2 Raw map



X Index: 200



Y Index: 200

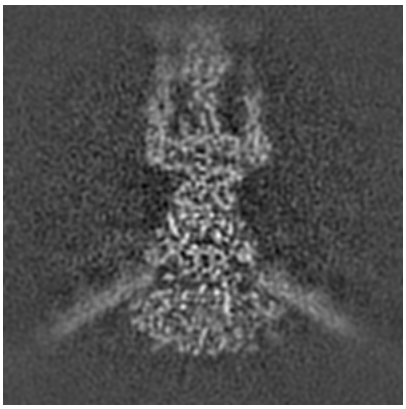


Z Index: 200

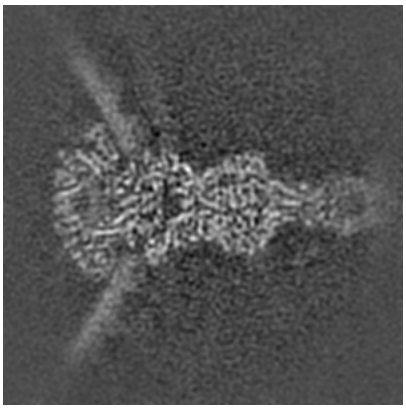
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

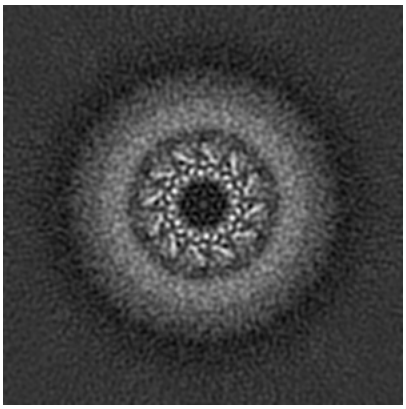
6.3.1 Primary map



X Index: 172

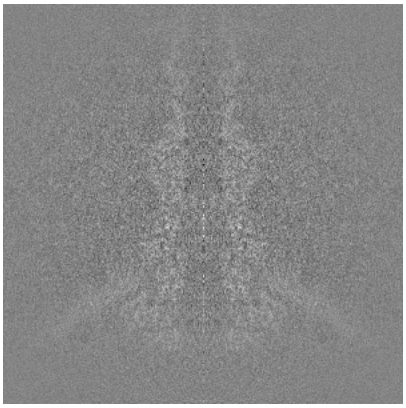


Y Index: 224

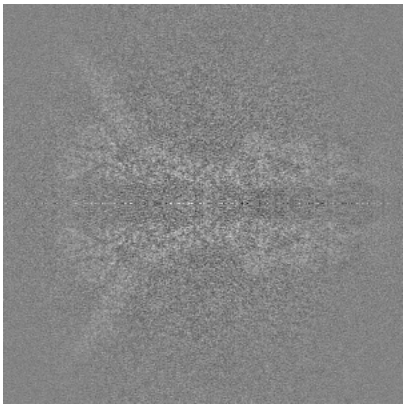


Z Index: 111

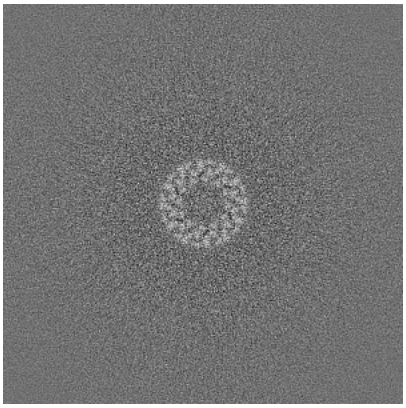
6.3.2 Raw map



X Index: 200



Y Index: 200

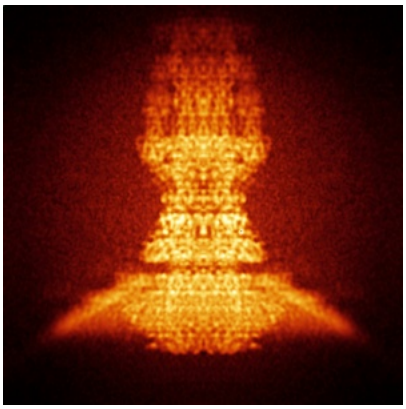


Z Index: 187

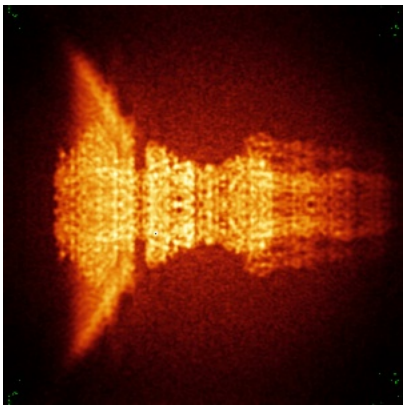
The images above show the largest variance slices of the map in three orthogonal directions.

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

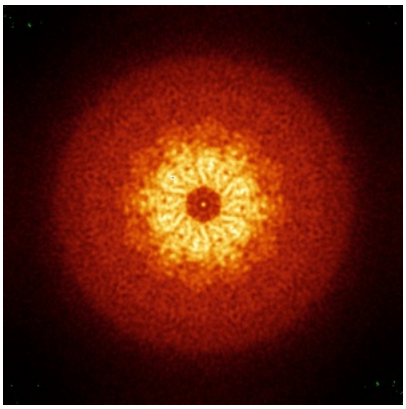
6.4.1 Primary map



X

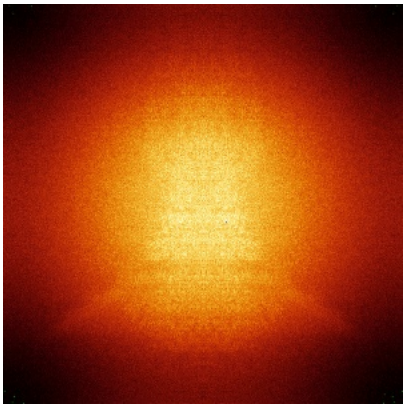


Y

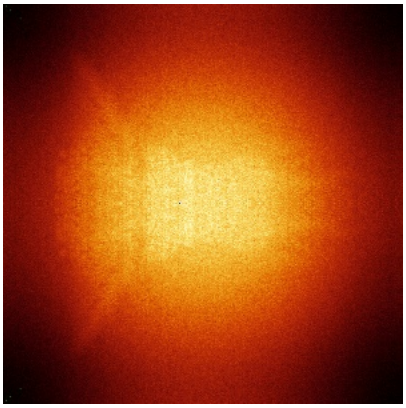


Z

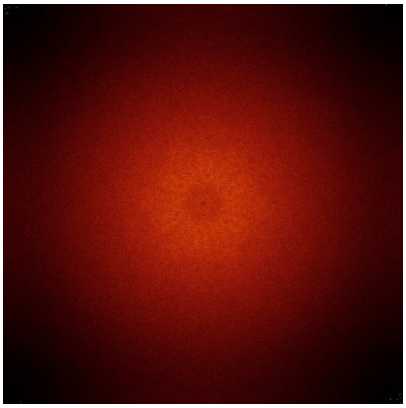
6.4.2 Raw map



X



Y



Z

The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

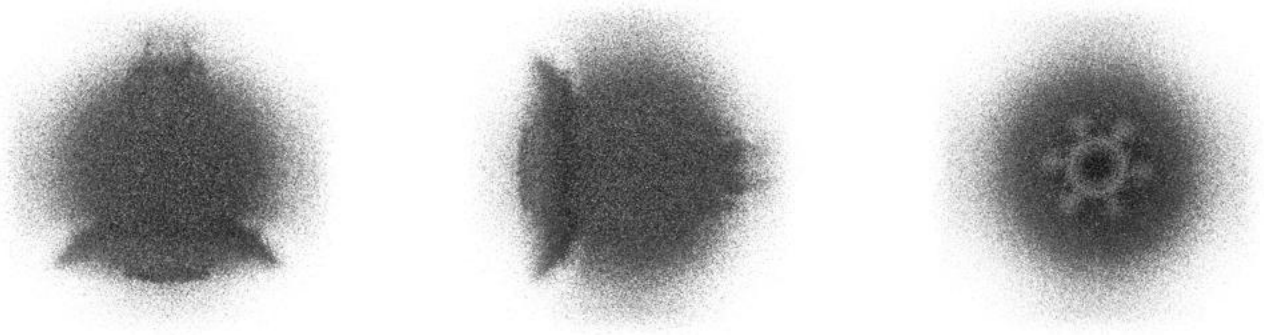
6.5 Orthogonal surface views (i)

6.5.1 Primary map

X Y Z

The images above show the 3D surface view of the map at the recommended contour level 1.5. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



X Y Z

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

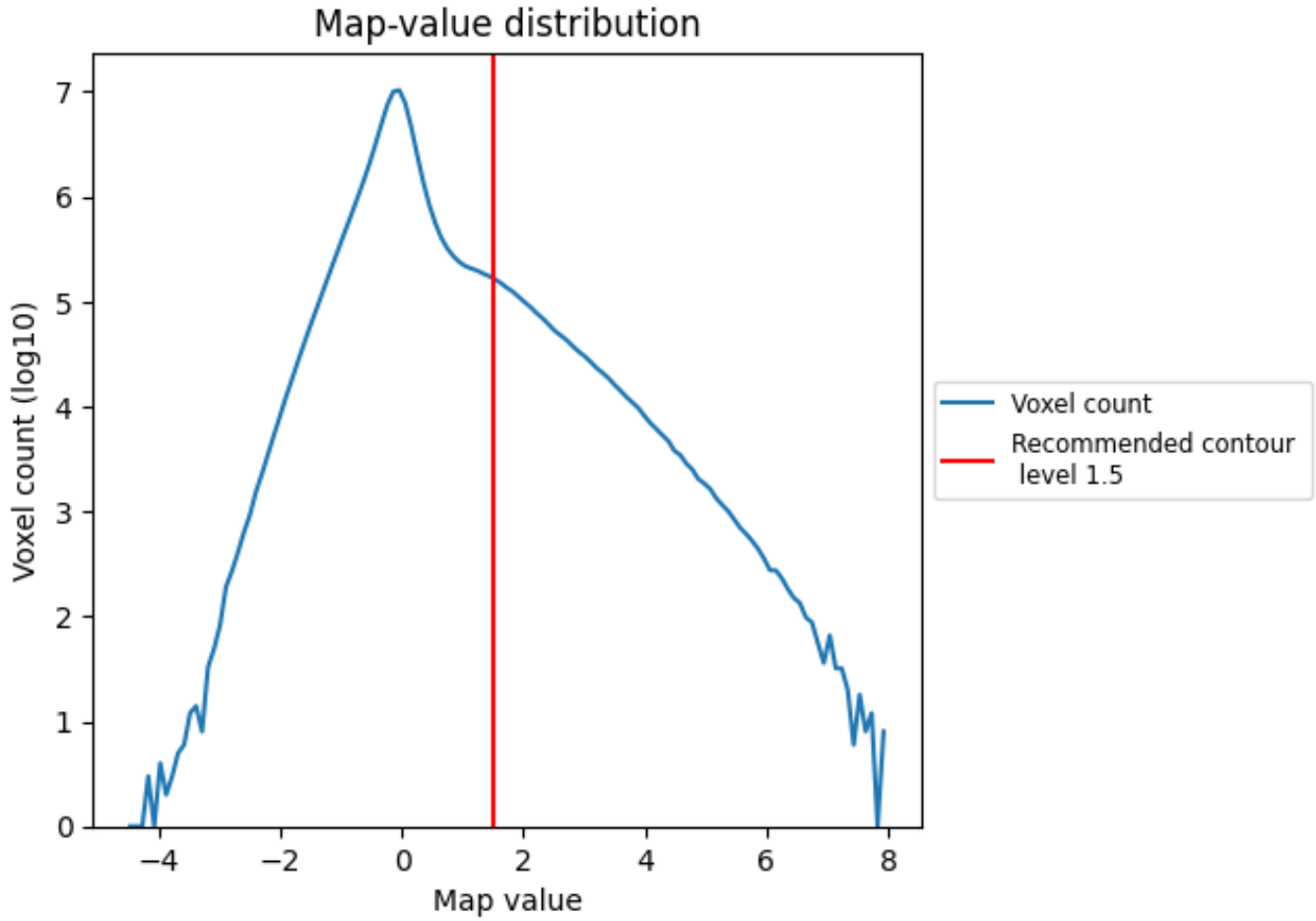
6.6 Mask visualisation (i)

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

7 Map analysis

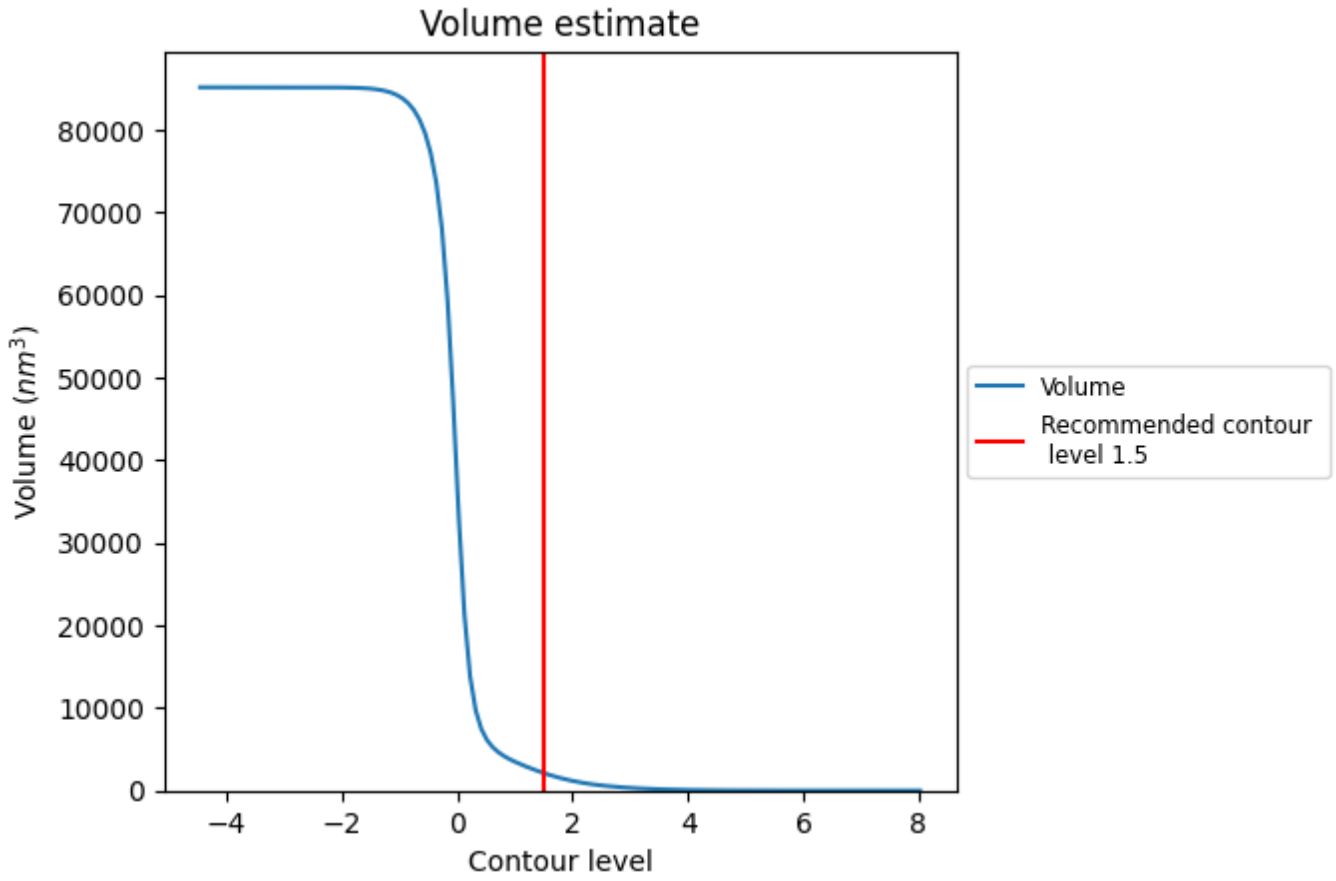
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

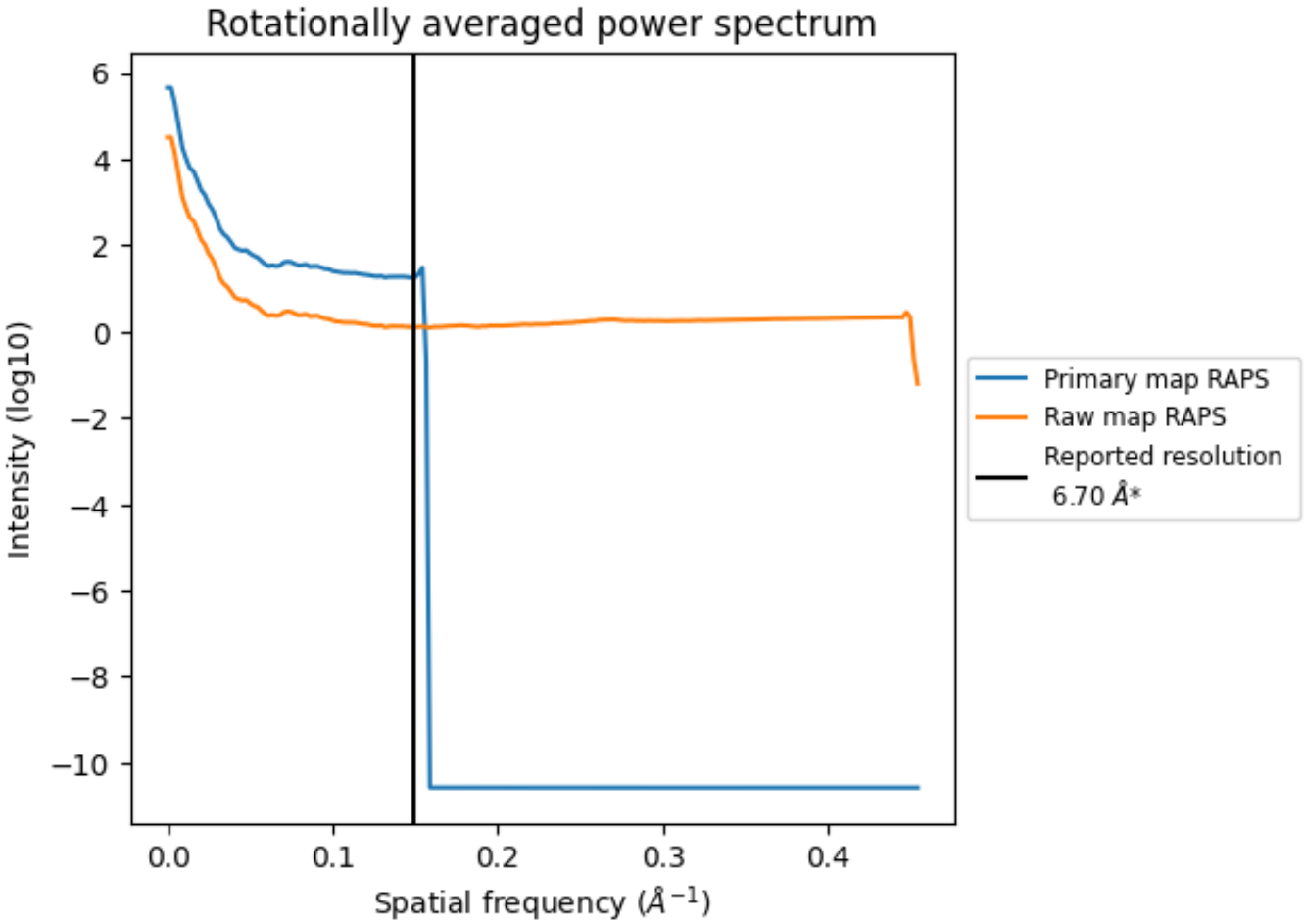
7.2 Volume estimate



The volume at the recommended contour level is 2120 nm^3; this corresponds to an approximate mass of 1915 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.

7.3 Rotationally averaged power spectrum (i)

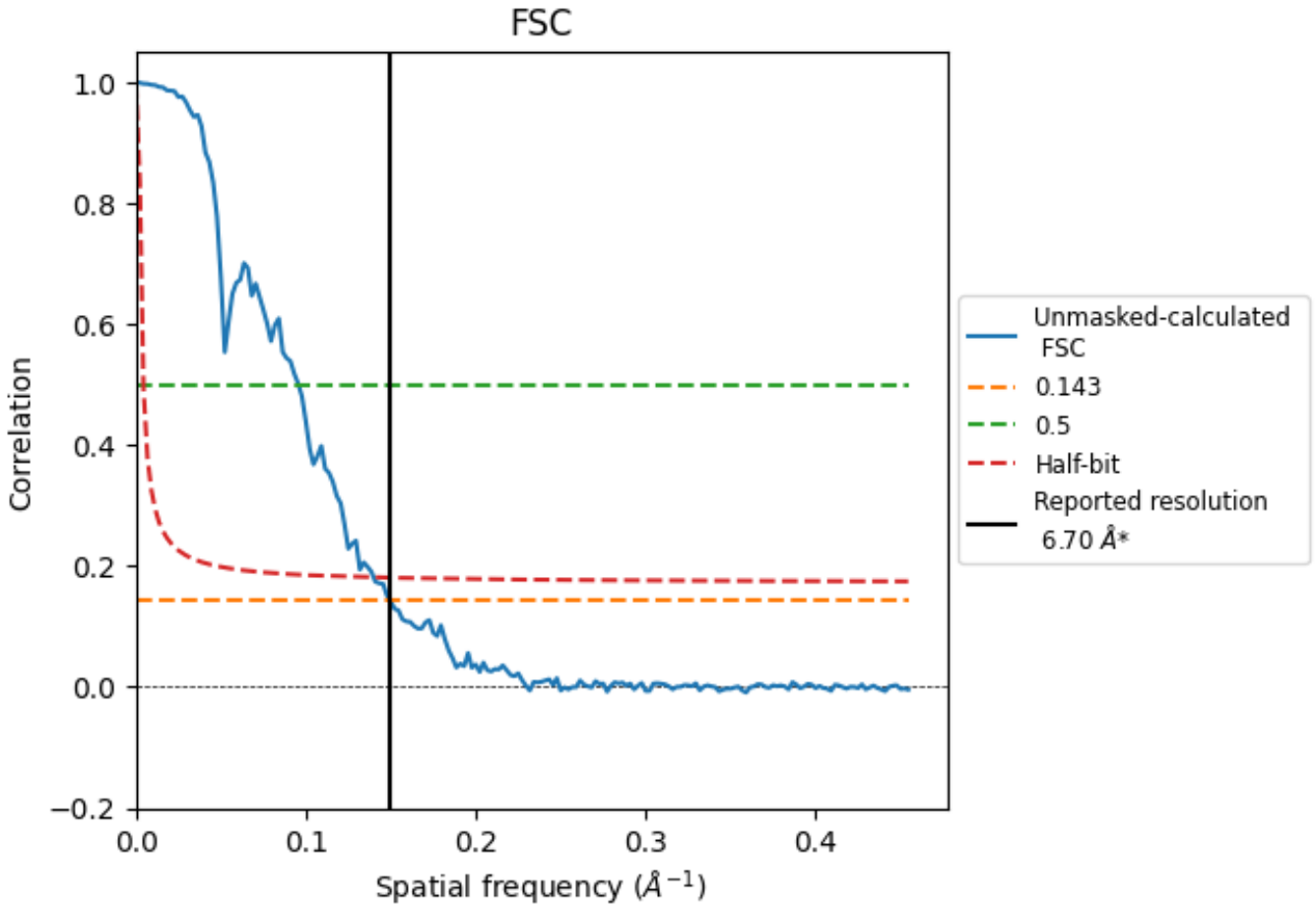


*Reported resolution corresponds to spatial frequency of 0.149 Å^{-1}

8 Fourier-Shell correlation

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

8.1 FSC



*Reported resolution corresponds to spatial frequency of 0.149 Å^{-1}

8.2 Resolution estimates (i)

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	6.70	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	6.69	10.46	7.15

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

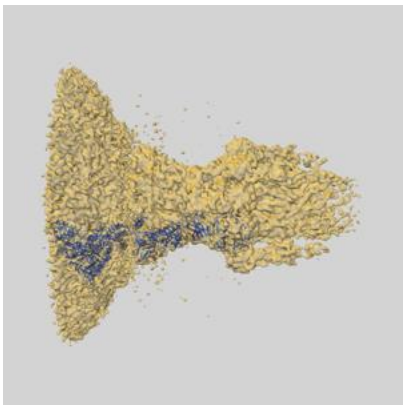
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-60199 and PDB model 8ZKM. Per-residue inclusion information can be found in section 3 on page 4.

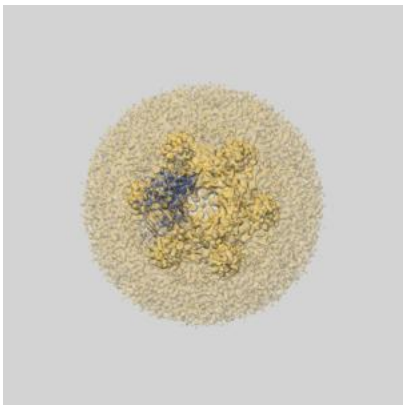
9.1 Map-model overlays

9.1.1 Map-model overlay

X

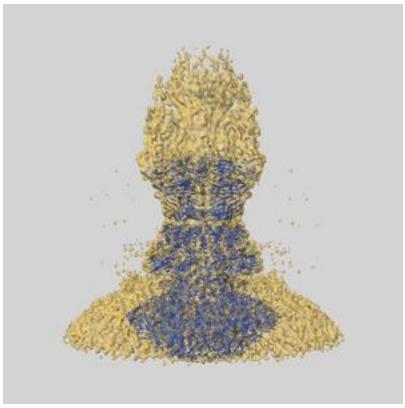


Y

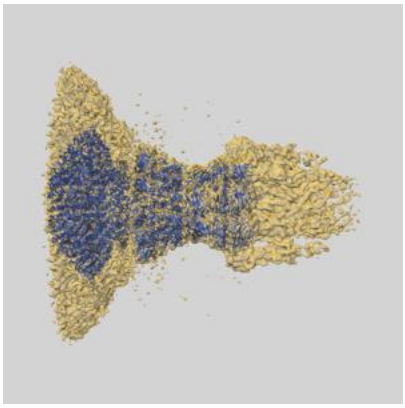


Z

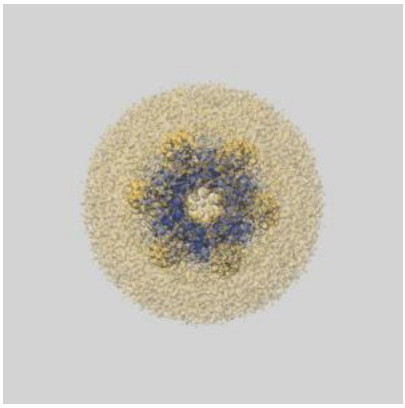
9.1.2 Map-model assembly overlay



X



Y



Z

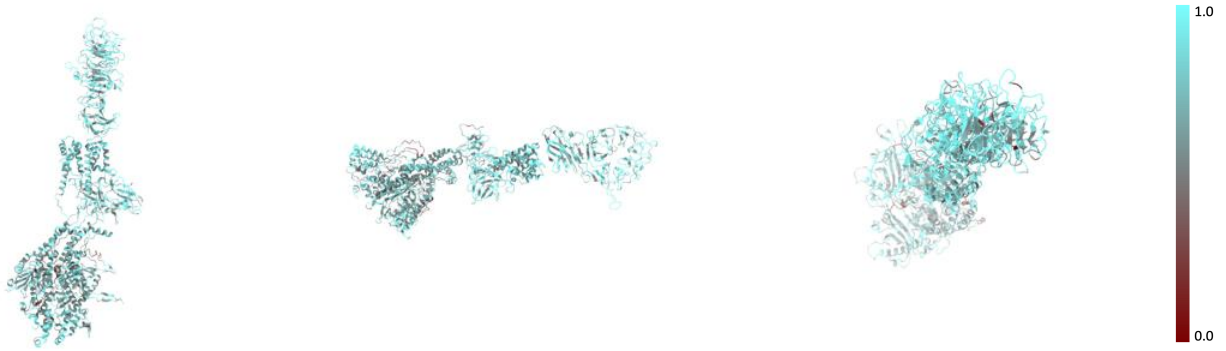
The images above show the 3D surface view of the map at the recommended contour level 1.5 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2 Q-score mapped to coordinate model (i)

X Y Z

The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions at which atoms can be resolved. Low Q-score values may therefore be expected for many entries.

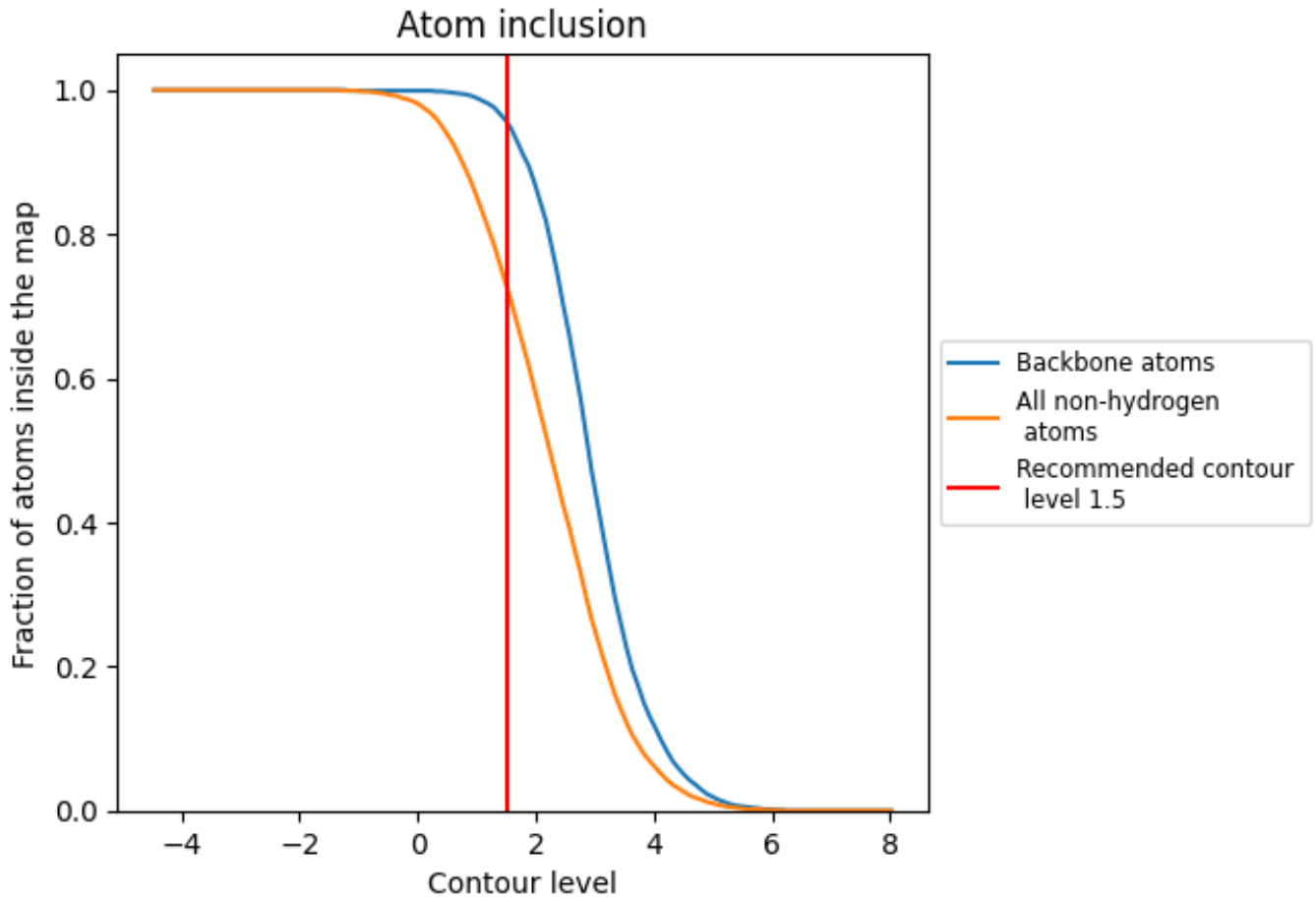
9.3 Atom inclusion mapped to coordinate model (i)



X Y Z

The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (1.5).

9.4 Atom inclusion (i)



At the recommended contour level, 96% of all backbone atoms, 73% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary

The table lists the average atom inclusion at the recommended contour level (1.5) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7300	0.1910
A	0.7630	0.2620
B	0.7830	0.1980
C	0.7880	0.2090
E	0.7920	0.2030
K	0.6910	0.1820
L	0.6740	0.1770