



Full wwPDB EM Validation Report ⓘ

Mar 7, 2026 – 02:24 AM UTC

PDB ID : 6QG1 / pdb_00006qg1
EMDB ID : EMD-4544
Title : Structure of eIF2B-eIF2 (phosphorylated at Ser51) complex (model 2)
Authors : Llacer, J.L.; Gordiyenko, Y.; Ramakrishnan, V.
Deposited on : 2019-01-10
Resolution : 4.25 Å(reported)
Based on initial models : 5B04, 6FYX

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:

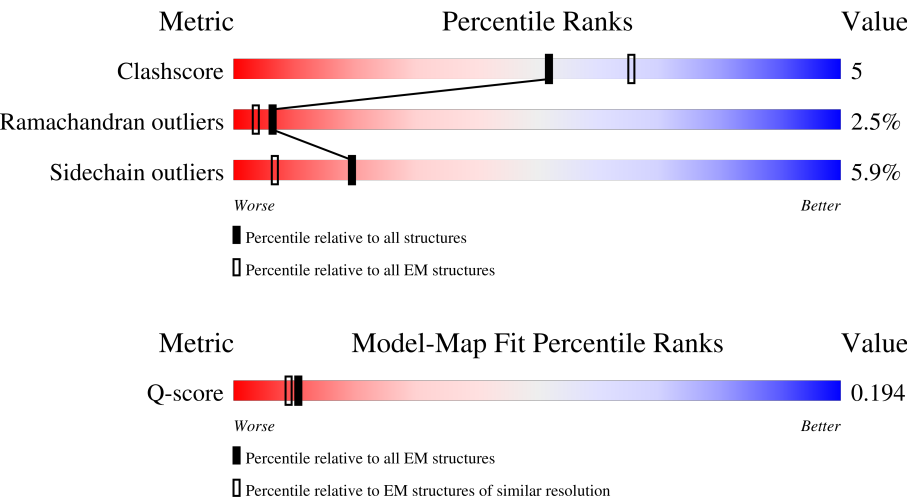
EMDB validation analysis : 0.0.1.dev132
Mogul : 2022.3.0, CSD as543be (2022)
MolProbity : 4-5-2 with Phenix2.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

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 4.25 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
Q-score	-	25397	4654 (3.75 - 4.75)

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

Mol	Chain	Length	Quality of chain
1	A	305	6% 73% 22% • •
1	B	305	6% 72% 22% • •
2	C	381	9% 73% 16% • 9%
2	D	381	9% 73% 15% • 9%

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Mol	Chain	Length	Quality of chain
3	E	578	
3	F	578	
4	G	651	
4	H	651	
5	I	712	
5	J	712	
6	K	304	
6	L	304	
7	M	527	
7	N	527	
8	O	285	
8	P	285	

2 Entry composition

There are 8 unique types of molecules in this entry. The entry contains 36980 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 Translation initiation factor eIF-2B subunit alpha.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	302	Total	C	N	O	S	0	0
			2351	1504	394	443	10		
1	B	302	Total	C	N	O	S	0	0
			2351	1504	394	443	10		

- Molecule 2 is a protein called Translation initiation factor eIF-2B subunit beta.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	D	345	Total	C	N	O	S	0	0
			2665	1694	463	502	6		
2	C	345	Total	C	N	O	S	0	0
			2665	1694	463	502	6		

- Molecule 3 is a protein called Translation initiation factor eIF-2B subunit gamma.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	E	267	Total	C	N	O	S	0	0
			2164	1391	363	400	10		
3	F	267	Total	C	N	O	S	0	0
			2164	1391	363	400	10		

- Molecule 4 is a protein called Translation initiation factor eIF-2B subunit delta.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	G	355	Total	C	N	O	S	0	0
			2744	1738	474	521	11		
4	H	355	Total	C	N	O	S	0	0
			2744	1738	474	521	11		

- Molecule 5 is a protein called Translation initiation factor eIF-2B subunit epsilon.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	I	431	Total	C	N	O	S	0	0
			3406	2147	573	666	20		
5	J	431	Total	C	N	O	S	0	0
			3406	2147	573	666	20		

- Molecule 6 is a protein called Eukaryotic translation initiation factor 2 subunit alpha.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	L	246	Total	C	N	O	P S	0	0
			1973	1259	324	381	1 8		
6	K	246	Total	C	N	O	P S	0	0
			1973	1259	324	381	1 8		

- Molecule 7 is a protein called Eukaryotic translation initiation factor 2 subunit gamma.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	M	408	Total	C	N	O	S	0	0
			3044	1934	546	548	16		
7	N	408	Total	C	N	O	S	0	0
			3044	1934	546	548	16		

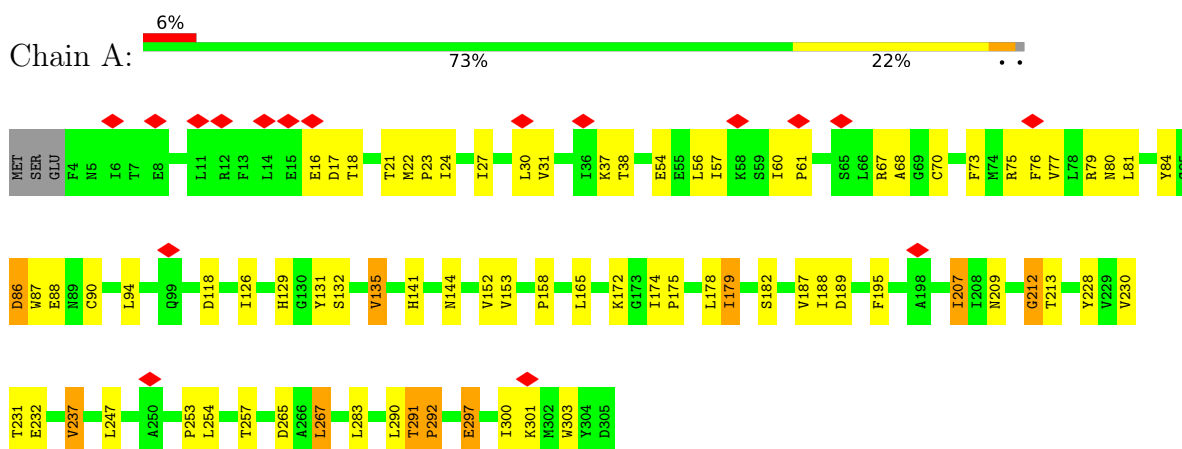
- Molecule 8 is a protein called Eukaryotic translation initiation factor 2 subunit beta.

Mol	Chain	Residues	Atoms				AltConf	Trace
8	O	17	Total	C	N	O	0	0
			143	96	24	23		
8	P	17	Total	C	N	O	0	0
			143	96	24	23		

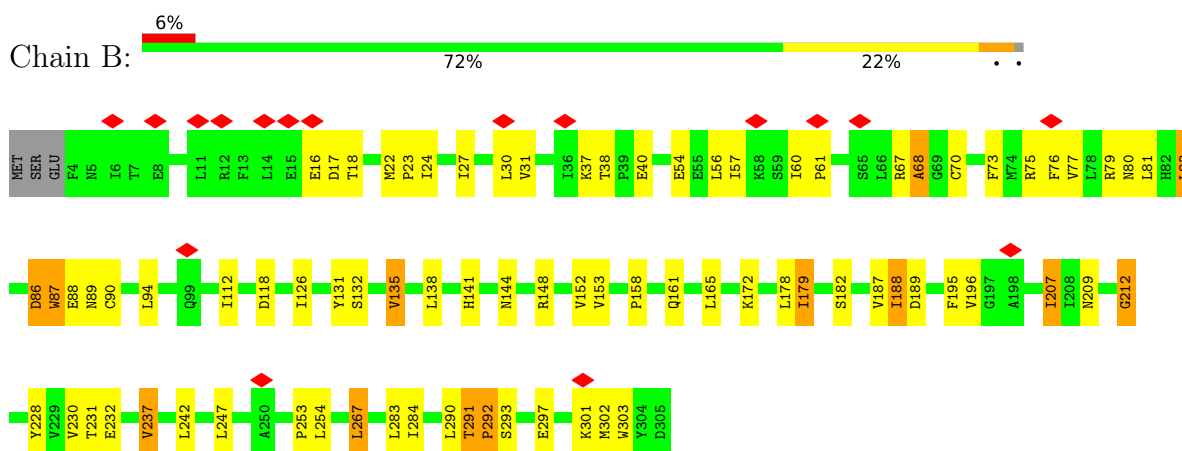
3 Residue-property plots

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

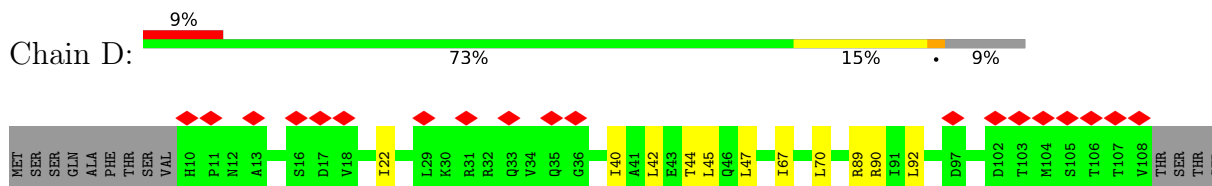
- Molecule 1: Translation initiation factor eIF-2B subunit alpha



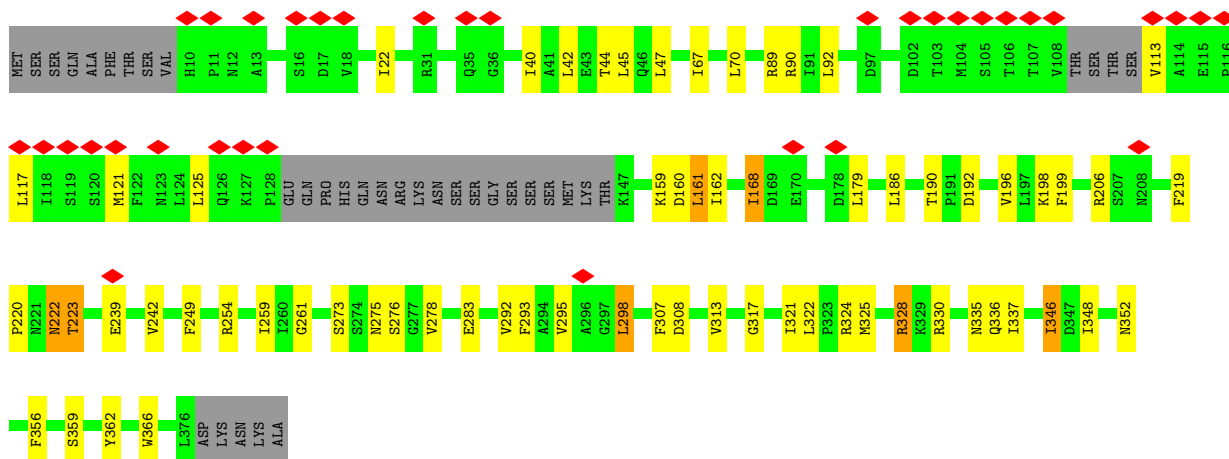
- Molecule 1: Translation initiation factor eIF-2B subunit alpha



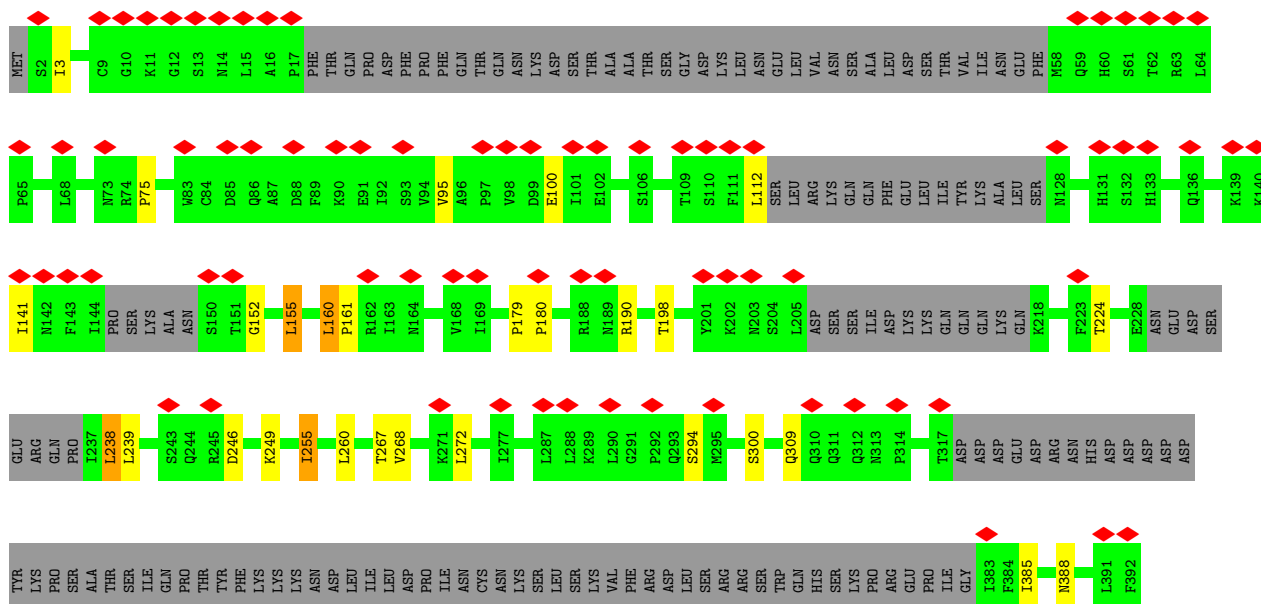
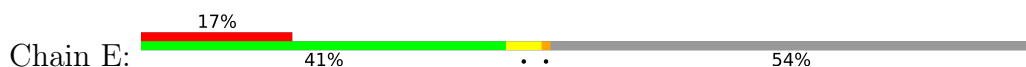
- Molecule 2: Translation initiation factor eIF-2B subunit beta

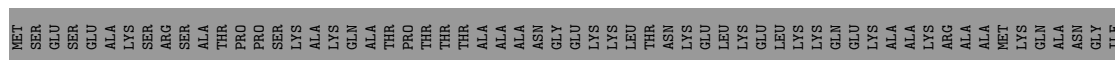


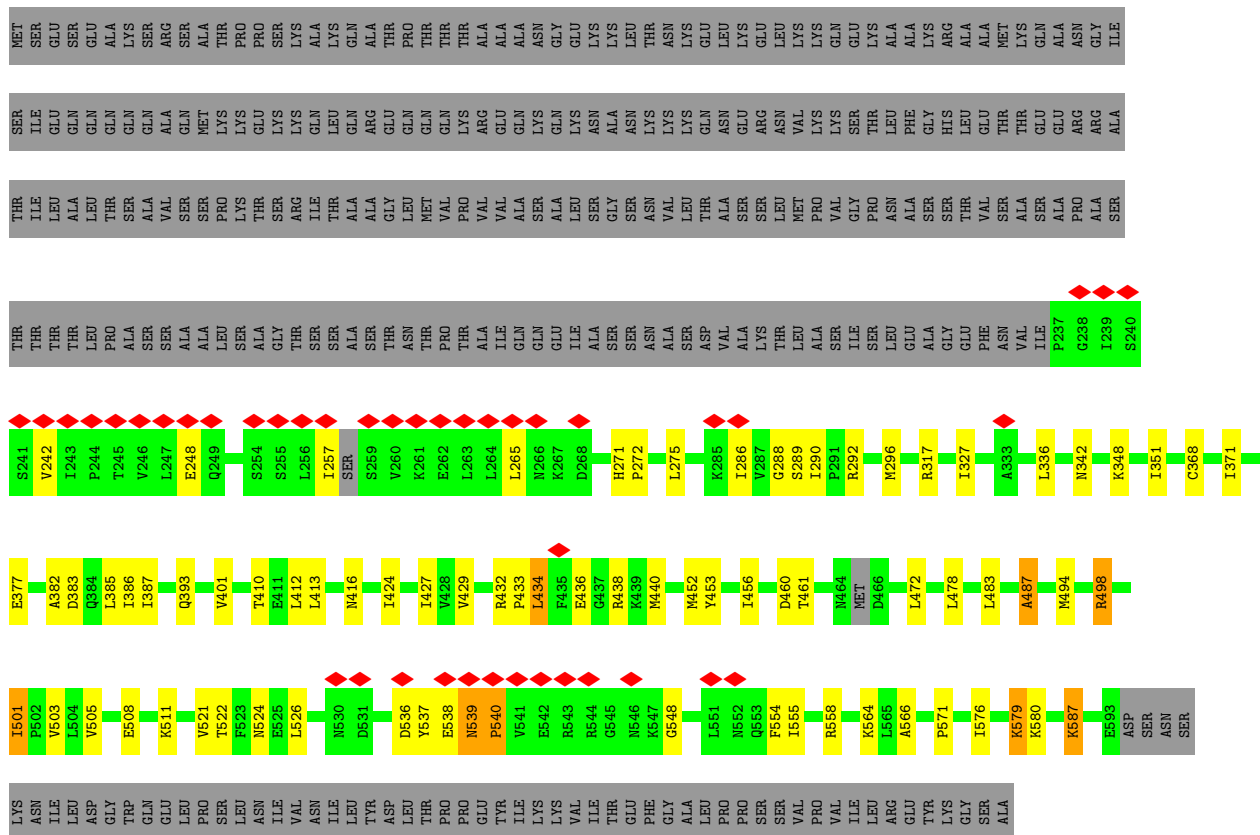
- Molecule 2: Translation initiation factor eIF-2B subunit beta



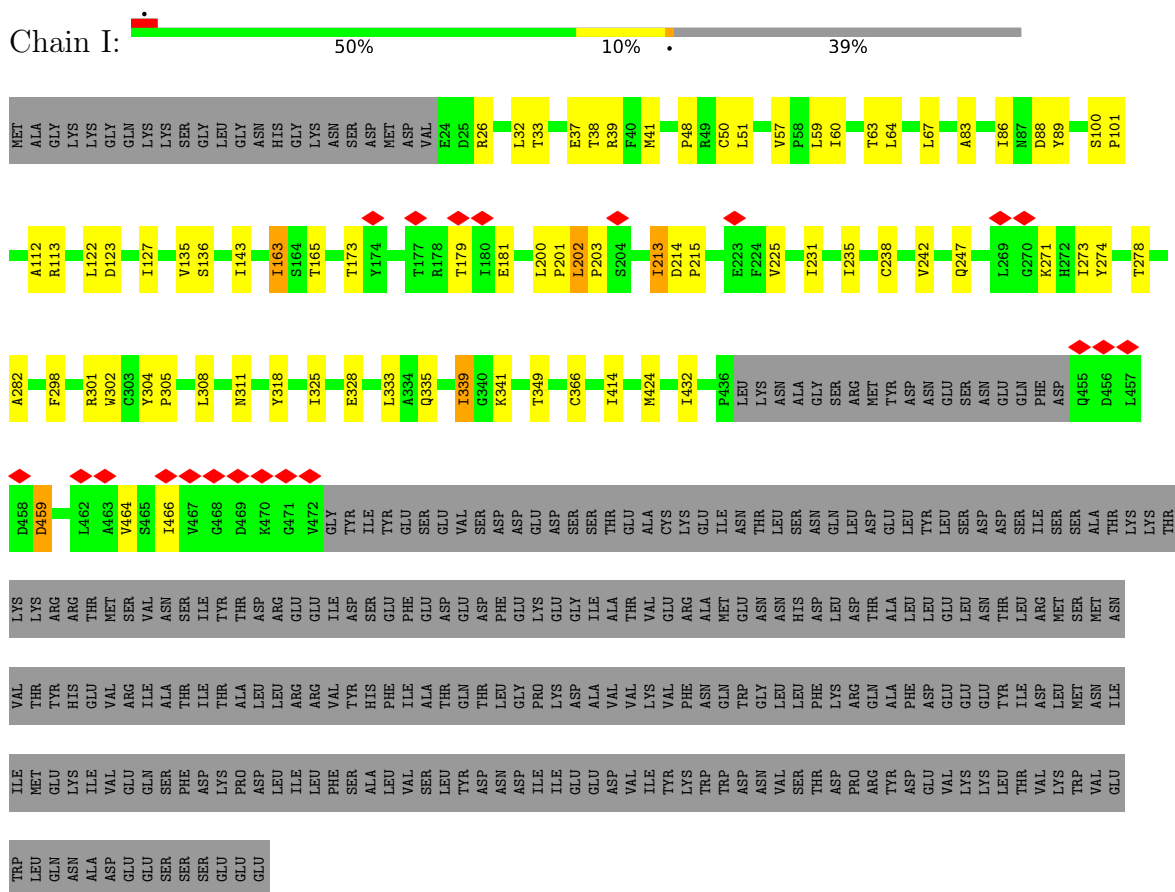
- Molecule 3: Translation initiation factor eIF-2B subunit gamma



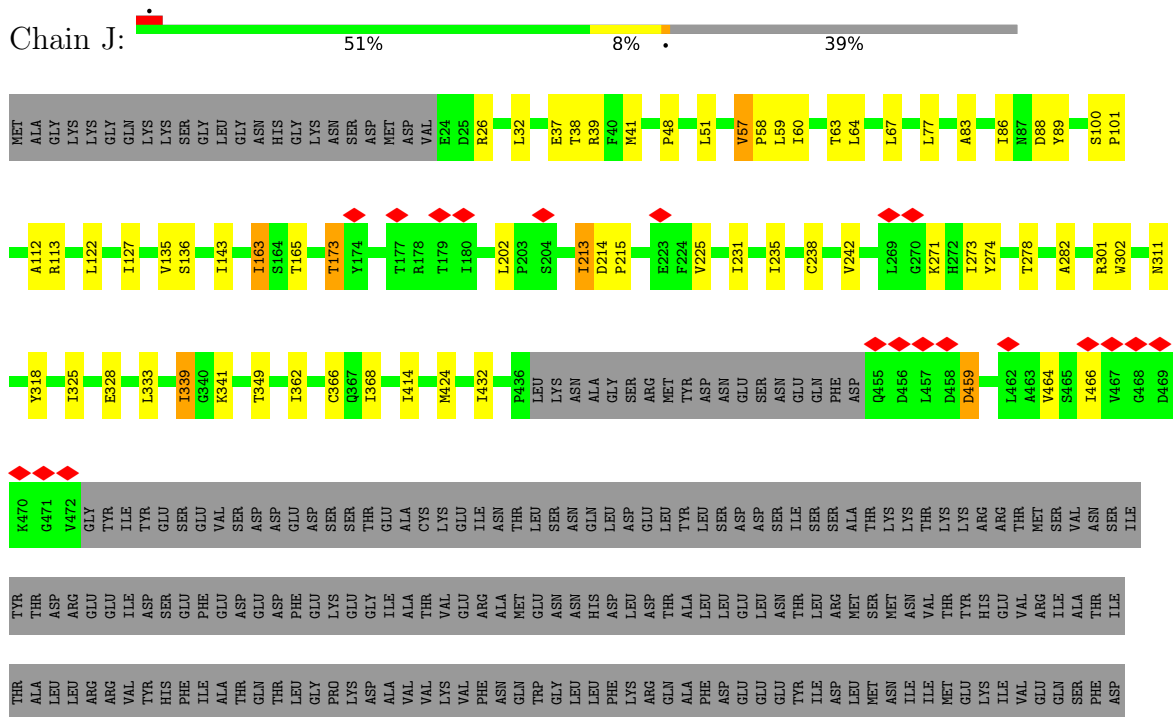


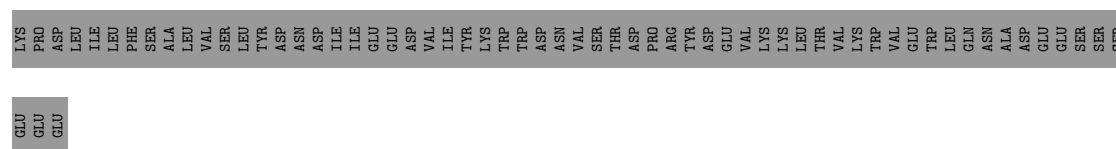


Chain I:

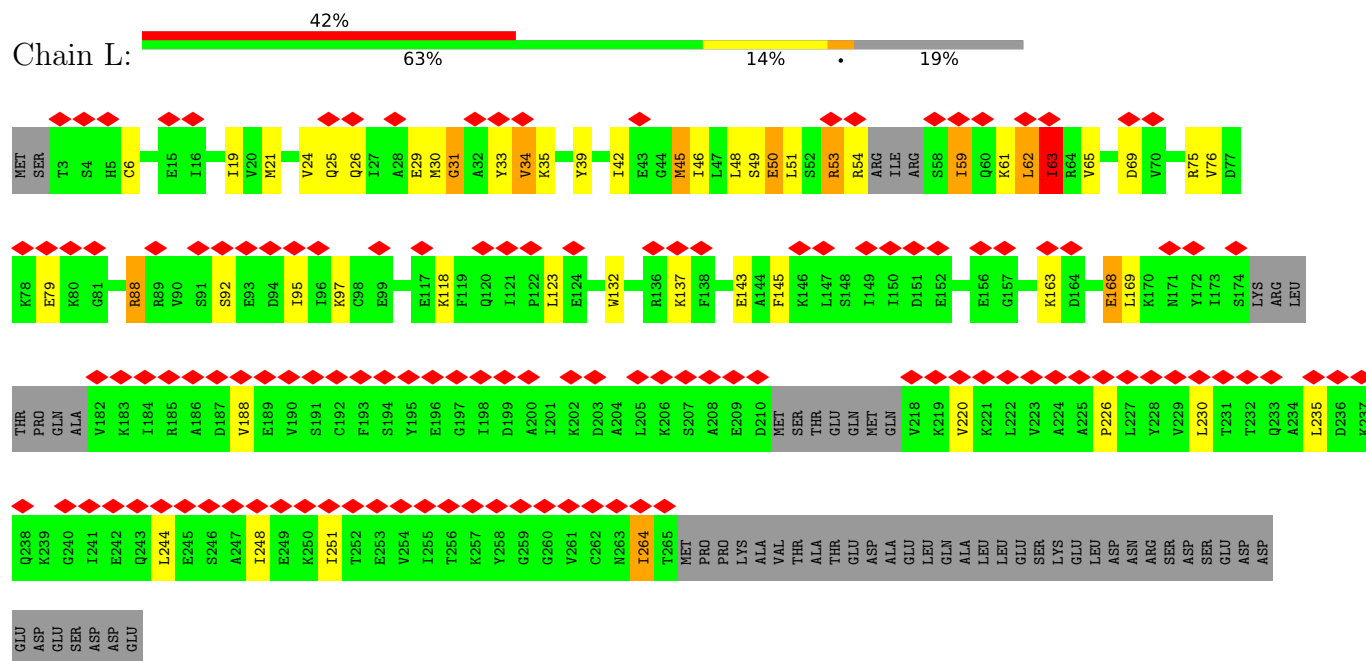


Chain J:

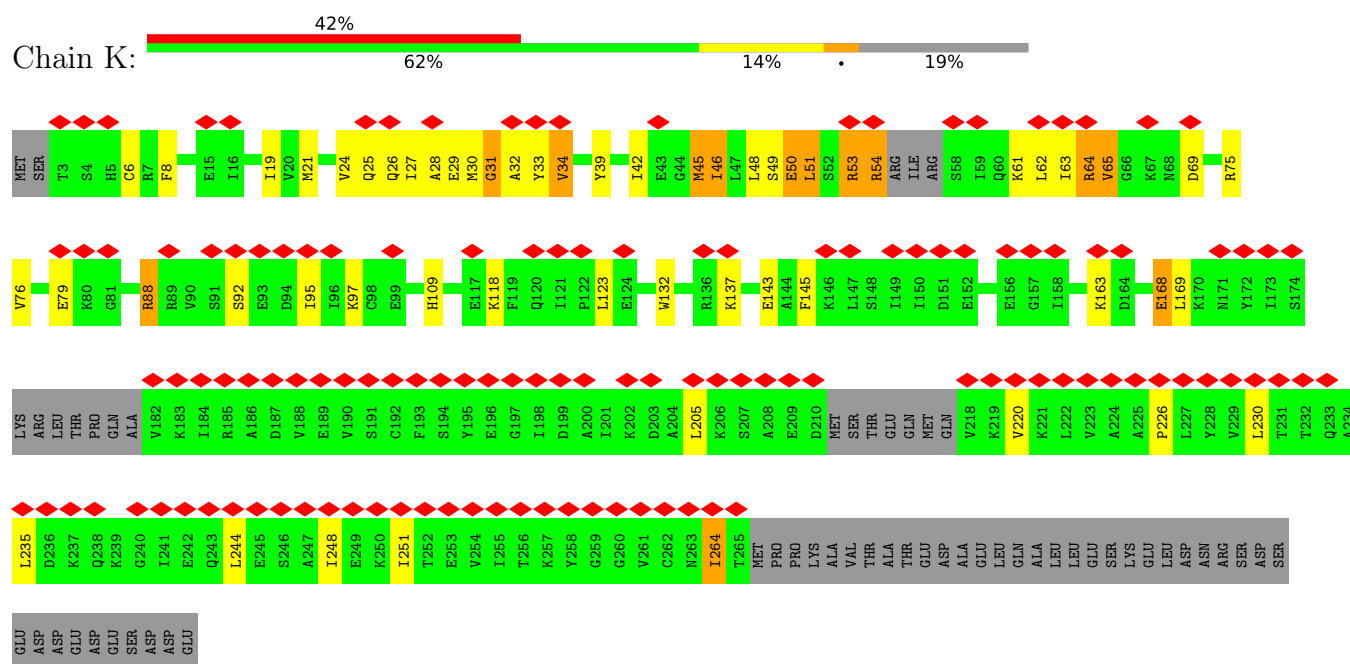




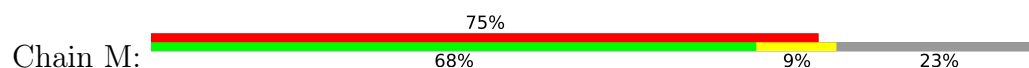
• Molecule 6: Eukaryotic translation initiation factor 2 subunit alpha

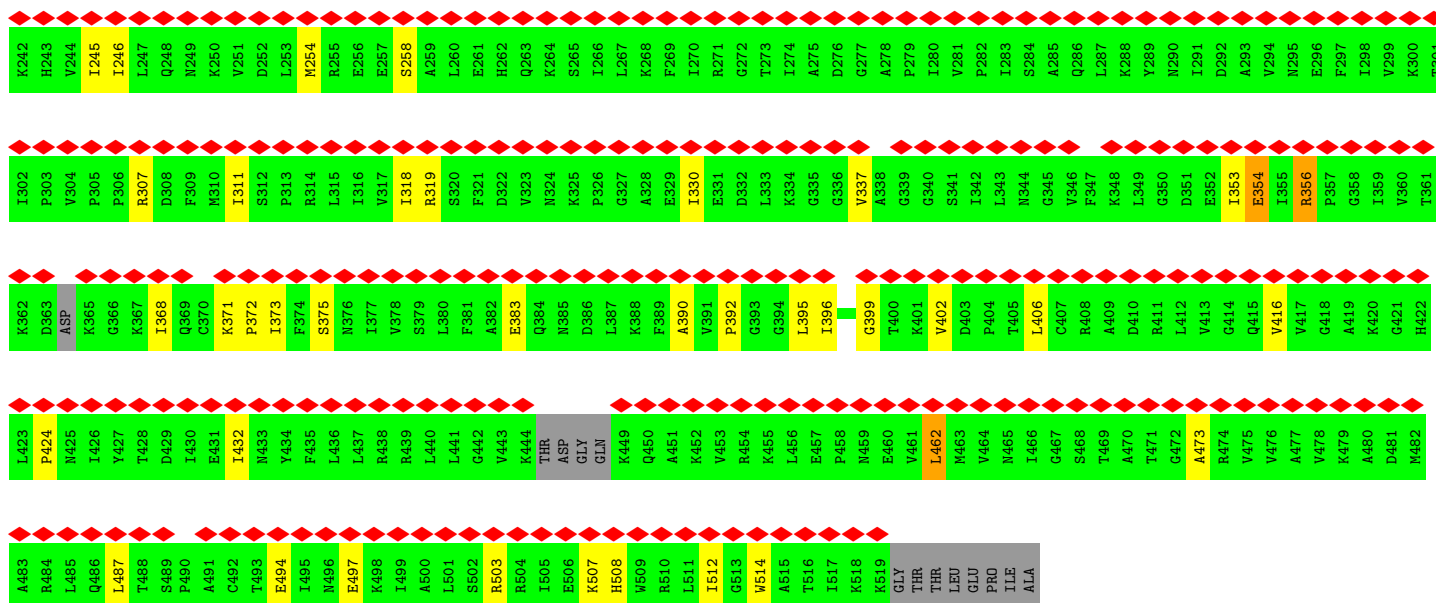


• Molecule 6: Eukaryotic translation initiation factor 2 subunit alpha

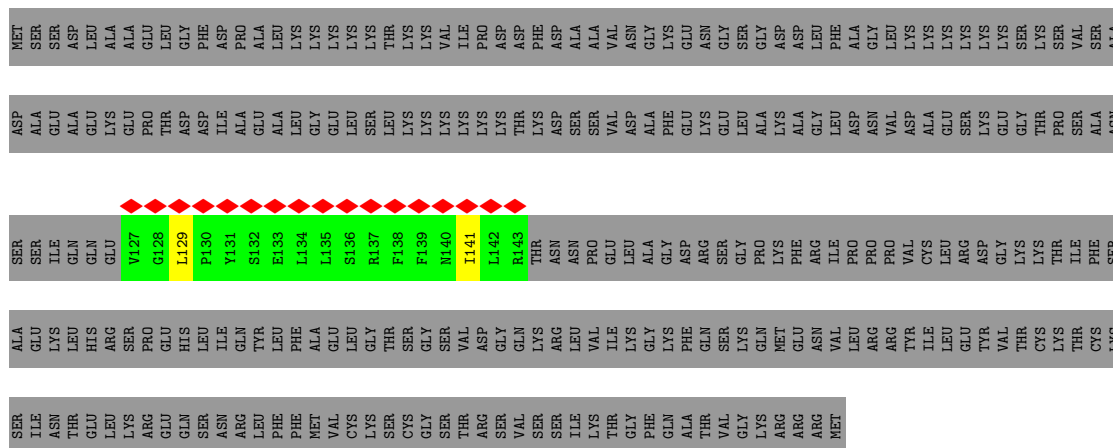


• Molecule 7: Eukaryotic translation initiation factor 2 subunit gamma

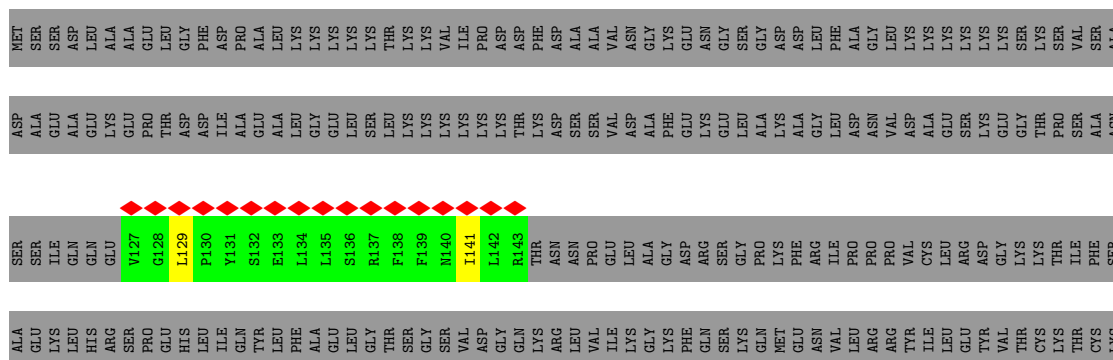




• Molecule 8: Eukaryotic translation initiation factor 2 subunit beta



• Molecule 8: Eukaryotic translation initiation factor 2 subunit beta



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4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C2	Depositor
Number of particles used	183468	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	45	Depositor
Minimum defocus (nm)	1500	Depositor
Maximum defocus (nm)	3500	Depositor
Magnification	104478	Depositor
Image detector	FEI FALCON III (4k x 4k)	Depositor
Maximum map value	0.416	Depositor
Minimum map value	-0.261	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.010	Depositor
Recommended contour level	0.045	Depositor
Map size (Å)	375.2, 375.2, 375.2	wwPDB
Map dimensions	280, 280, 280	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.34, 1.34, 1.34	Depositor

5 Model quality

5.1 Standard geometry

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

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	0.65	0/2395	1.01	2/3251 (0.1%)
1	B	0.68	2/2395 (0.1%)	1.01	2/3251 (0.1%)
2	C	0.56	0/2714	1.01	0/3693
2	D	0.56	0/2714	1.00	0/3693
3	E	0.61	0/2209	0.90	0/2989
3	F	0.61	0/2209	0.90	0/2989
4	G	0.60	0/2781	1.02	0/3747
4	H	0.60	0/2781	1.03	1/3747 (0.0%)
5	I	0.55	0/3468	0.93	3/4704 (0.1%)
5	J	0.56	0/3468	0.93	2/4704 (0.0%)
6	K	0.66	0/1988	0.98	0/2674
6	L	0.66	0/1988	0.96	0/2674
7	M	0.67	0/3087	0.90	1/4173 (0.0%)
7	N	0.67	0/3087	0.90	1/4173 (0.0%)
8	O	0.61	0/146	0.93	0/196
8	P	0.61	0/146	0.92	0/196
All	All	0.61	2/37576 (0.0%)	0.96	12/50854 (0.0%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	89	ASN	N-CA	6.61	1.54	1.46
1	B	68	ALA	C-N	-5.66	1.25	1.33

All (12) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	N	356	ARG	N-CA-C	6.75	121.39	112.35
7	M	356	ARG	N-CA-C	6.71	121.33	112.35
4	H	501	ILE	N-CA-C	6.21	114.79	109.02

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	207	ILE	N-CA-C	5.29	116.34	108.46
1	B	209	ASN	N-CA-C	5.24	115.20	108.34
1	B	207	ILE	N-CA-C	5.23	116.26	108.46
5	I	202	LEU	N-CA-C	5.14	121.16	109.81
5	I	57	VAL	CA-C-N	5.13	126.25	119.84
5	I	57	VAL	C-N-CA	5.13	126.25	119.84
5	J	57	VAL	CA-C-N	5.06	126.17	119.84
5	J	57	VAL	C-N-CA	5.06	126.17	119.84
1	A	209	ASN	N-CA-C	5.03	114.79	108.45

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts ⓘ

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2351	0	2365	47	0
1	B	2351	0	2365	55	0
2	C	2665	0	2626	40	0
2	D	2665	0	2626	35	0
3	E	2164	0	2154	12	0
3	F	2164	0	2154	10	0
4	G	2744	0	2819	39	0
4	H	2744	0	2819	39	0
5	I	3406	0	3359	31	0
5	J	3406	0	3359	26	0
6	K	1973	0	2016	40	0
6	L	1973	0	2014	50	0
7	M	3044	0	3126	18	0
7	N	3044	0	3126	17	0
8	O	143	0	148	0	0
8	P	143	0	148	0	0
All	All	36980	0	37224	399	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 5.

All (399) 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)
6:L:25:GLN:OE1	6:L:35:LYS:HE2	1.34	1.21
6:L:25:GLN:OE1	6:L:35:LYS:CE	1.98	1.11
6:L:26:GLN:HG2	6:L:33:TYR:N	1.34	1.10
1:A:31:VAL:HG22	1:A:73:PHE:CE2	1.89	1.06
1:B:81:LEU:HG	1:B:90:CYS:SG	1.95	1.05
1:A:31:VAL:CG2	1:A:73:PHE:HE2	1.70	1.03
6:L:30:MET:O	6:L:48:LEU:HD12	1.58	1.00
1:A:31:VAL:CG2	1:A:73:PHE:CE2	2.46	0.98
6:L:26:GLN:CG	6:L:33:TYR:N	2.18	0.98
6:K:24:VAL:O	6:K:65:VAL:HG23	1.66	0.95
1:B:31:VAL:CG2	1:B:73:PHE:HE2	1.81	0.93
6:L:25:GLN:OE1	6:L:35:LYS:CD	2.16	0.93
1:B:31:VAL:HG22	1:B:73:PHE:CE2	2.04	0.92
6:K:21:MET:SD	6:K:69:ASP:O	2.28	0.91
1:A:77:VAL:HA	1:A:94:LEU:HD21	1.53	0.91
6:L:21:MET:SD	6:L:69:ASP:O	2.29	0.90
6:K:54:ARG:HB3	6:K:54:ARG:HH11	1.34	0.90
1:B:31:VAL:CG2	1:B:73:PHE:CE2	2.58	0.86
1:B:77:VAL:HA	1:B:94:LEU:HD21	1.56	0.86
1:A:31:VAL:HG22	1:A:73:PHE:HE2	1.31	0.85
6:K:88:ARG:HH21	6:K:88:ARG:HG2	1.43	0.84
1:B:80:ASN:HB3	1:B:90:CYS:SG	2.19	0.83
1:A:80:ASN:HB3	1:A:90:CYS:SG	2.20	0.82
6:L:26:GLN:HG2	6:L:33:TYR:H	1.45	0.81
1:B:75:ARG:NH1	1:B:303:TRP:HA	1.96	0.81
1:A:31:VAL:HG22	1:A:73:PHE:CZ	2.16	0.80
1:A:77:VAL:HA	1:A:94:LEU:CD2	2.12	0.79
6:K:27:ILE:HG21	6:K:64:ARG:NH2	1.98	0.79
6:L:25:GLN:H	6:L:34:VAL:HG12	1.49	0.77
1:B:31:VAL:HG22	1:B:73:PHE:HE2	1.43	0.77
6:K:25:GLN:H	6:K:34:VAL:HG12	1.49	0.76
3:F:160:LEU:H	3:F:161:PRO:HD2	1.50	0.76
6:K:54:ARG:HH11	6:K:54:ARG:CB	1.98	0.76
3:E:160:LEU:H	3:E:161:PRO:HD2	1.49	0.76
6:L:88:ARG:HG2	6:L:88:ARG:HH21	1.49	0.74
1:A:84:TYR:CE1	6:L:88:ARG:HD2	2.23	0.74
6:K:24:VAL:HB	6:K:65:VAL:HA	1.69	0.74
6:L:26:GLN:HG2	6:L:33:TYR:CA	2.18	0.73
1:A:267:LEU:HA	1:B:178:LEU:HD23	1.73	0.71
6:K:50:GLU:HA	6:K:50:GLU:OE1	1.89	0.71

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:L:53:ARG:HD2	6:L:88:ARG:CG	2.21	0.70
6:K:25:GLN:HB2	6:K:34:VAL:HA	1.73	0.70
6:K:27:ILE:CG2	6:K:64:ARG:NH2	2.56	0.69
1:A:75:ARG:NH1	1:A:303:TRP:HA	2.08	0.68
1:B:31:VAL:HG22	1:B:73:PHE:CZ	2.28	0.68
1:A:31:VAL:HG23	1:A:73:PHE:CE2	2.29	0.67
1:B:75:ARG:HH11	1:B:303:TRP:HA	1.60	0.66
1:B:77:VAL:HA	1:B:94:LEU:CD2	2.24	0.66
6:K:88:ARG:HG2	6:K:88:ARG:NH2	2.11	0.66
2:D:321:ILE:HD11	2:D:335:ASN:HB2	1.79	0.65
1:A:297:GLU:O	1:A:301:LYS:HG3	1.97	0.65
1:A:178:LEU:HD23	1:B:267:LEU:HA	1.78	0.65
3:F:255:ILE:HD11	5:I:213:ILE:HD11	1.79	0.64
5:J:349:THR:HG22	5:J:366:CYS:H	1.63	0.63
6:K:27:ILE:HG21	6:K:64:ARG:HH21	1.62	0.63
1:A:84:TYR:CE1	6:L:50:GLU:OE1	2.53	0.62
3:E:255:ILE:HD11	5:J:213:ILE:HD11	1.81	0.62
6:L:25:GLN:OE1	6:L:35:LYS:HD3	1.99	0.62
6:L:26:GLN:HG2	6:L:33:TYR:C	2.24	0.62
5:I:349:THR:HG22	5:I:366:CYS:H	1.63	0.62
6:L:25:GLN:CD	6:L:35:LYS:HG2	2.25	0.62
1:B:40:GLU:O	6:K:75:ARG:NE	2.33	0.61
1:A:84:TYR:HE1	6:L:50:GLU:OE1	1.83	0.60
4:G:373:GLN:O	4:G:377:GLU:HG3	2.01	0.60
6:K:24:VAL:C	6:K:65:VAL:HG23	2.27	0.60
6:L:24:VAL:HB	6:L:65:VAL:HA	1.84	0.60
6:L:65:VAL:HG23	6:L:65:VAL:O	2.02	0.60
2:C:321:ILE:HD11	2:C:335:ASN:HB2	1.84	0.59
1:B:68:ALA:HB2	1:B:237:VAL:HG22	1.83	0.59
4:H:377:GLU:OE1	6:K:61:LYS:HB3	2.03	0.59
1:B:67:ARG:O	1:B:70:CYS:SG	2.56	0.58
7:N:142:TYR:HB2	7:N:319:ARG:HH12	1.68	0.58
6:K:54:ARG:HH11	6:K:54:ARG:CG	2.16	0.58
1:A:68:ALA:HB2	1:A:237:VAL:HG22	1.85	0.58
2:D:249:PHE:CE2	4:H:494:MET:HE3	2.39	0.58
5:I:163:ILE:HD11	5:I:271:LYS:HB3	1.86	0.58
6:L:50:GLU:OE1	6:L:50:GLU:HA	2.03	0.58
2:D:292:VAL:HB	2:D:346:ILE:HA	1.85	0.58
5:J:163:ILE:HD11	5:J:271:LYS:HB3	1.85	0.58
4:G:461:THR:HG21	2:C:336:GLN:HG2	1.84	0.58
2:C:90:ARG:HG2	2:C:161:LEU:HD21	1.85	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:301:LYS:HD3	2:C:121:MET:H	1.69	0.57
2:C:292:VAL:HB	2:C:346:ILE:HA	1.86	0.57
4:H:383:ASP:HA	4:H:386:ILE:HD12	1.86	0.57
2:D:90:ARG:HG2	2:D:161:LEU:HD21	1.87	0.57
2:C:196:VAL:HG21	2:C:261:GLY:HA2	1.86	0.57
1:B:31:VAL:HG23	1:B:73:PHE:CE2	2.37	0.56
6:K:220:VAL:HG13	6:K:230:LEU:HB3	1.86	0.56
1:A:135:VAL:HG22	1:A:230:VAL:HB	1.88	0.56
3:E:267:THR:HG23	5:J:225:VAL:HG22	1.86	0.56
1:B:75:ARG:HD3	1:B:302:MET:O	2.06	0.56
4:G:494:MET:HE3	2:C:249:PHE:CE2	2.41	0.56
6:L:26:GLN:HG3	6:L:34:VAL:HG13	1.87	0.55
2:D:298:LEU:HG	2:D:352:ASN:HD21	1.72	0.55
2:D:196:VAL:HG21	2:D:261:GLY:HA2	1.88	0.55
6:L:53:ARG:HD2	6:L:88:ARG:HG3	1.88	0.55
1:A:283:LEU:HB3	1:A:291:THR:HA	1.89	0.54
7:M:307:ARG:HD3	7:M:392:PRO:HB2	1.89	0.54
1:B:292:PRO:HB2	2:C:359:SER:OG	2.07	0.54
2:D:249:PHE:HE2	4:H:494:MET:HE3	1.71	0.54
4:G:498:ARG:HD2	2:C:283:GLU:OE1	2.07	0.54
4:H:452:MET:HE2	5:J:341:LYS:HE2	1.88	0.54
7:N:307:ARG:HD3	7:N:392:PRO:HB2	1.90	0.54
6:L:220:VAL:HG13	6:L:230:LEU:HB3	1.89	0.54
2:C:298:LEU:HG	2:C:352:ASN:HD21	1.71	0.54
1:B:132:SER:HB3	1:B:135:VAL:HG23	1.90	0.54
6:L:26:GLN:CG	6:L:33:TYR:O	2.55	0.54
1:B:80:ASN:C	1:B:90:CYS:SG	2.91	0.53
2:D:168:ILE:HG23	2:D:352:ASN:HD22	1.73	0.53
4:G:483:LEU:HB3	4:G:566:ALA:HB3	1.90	0.53
4:H:438:ARG:HH12	4:H:538:GLU:HA	1.74	0.53
1:A:67:ARG:O	1:A:70:CYS:SG	2.62	0.53
3:F:198:THR:HB	3:F:272:LEU:HB3	1.90	0.53
6:L:88:ARG:HG2	6:L:88:ARG:NH2	2.22	0.53
2:C:168:ILE:HG23	2:C:352:ASN:HD22	1.74	0.53
1:A:132:SER:HB3	1:A:135:VAL:HG23	1.91	0.53
4:G:579:LYS:HG2	4:G:580:LYS:HG3	1.89	0.53
4:G:382:ALA:HA	4:G:385:LEU:HD12	1.91	0.53
6:L:25:GLN:OE1	6:L:35:LYS:CG	2.55	0.53
1:A:76:PHE:CE2	2:D:125:LEU:HA	2.44	0.53
2:D:336:GLN:HG2	4:H:461:THR:HG21	1.90	0.53
4:H:483:LEU:HB3	4:H:566:ALA:HB3	1.91	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:G:383:ASP:HA	4:G:386:ILE:HD12	1.91	0.53
7:M:375:SER:HB3	7:M:402:VAL:HG23	1.91	0.53
6:K:46:ILE:HB	6:K:51:LEU:HD11	1.89	0.53
1:A:152:VAL:HG13	1:A:179:ILE:HD13	1.91	0.53
1:A:195:PHE:HA	1:A:228:TYR:HB2	1.91	0.53
4:G:524:ASN:HD22	4:G:526:LEU:HG	1.73	0.53
7:N:462:LEU:HD22	7:N:503:ARG:HG2	1.91	0.52
6:L:26:GLN:OE1	6:L:31:GLY:O	2.27	0.52
7:M:462:LEU:HD22	7:M:503:ARG:HG2	1.91	0.52
3:F:246:ASP:HA	3:F:249:LYS:HB3	1.91	0.52
4:H:539:ASN:HB2	4:H:540:PRO:HD3	1.92	0.52
6:L:24:VAL:HG12	6:L:65:VAL:HG12	1.91	0.52
6:L:118:LYS:HE3	6:L:168:GLU:HG2	1.91	0.52
4:H:472:LEU:HB2	4:H:505:VAL:HG22	1.92	0.52
1:B:79:ARG:NE	1:B:79:ARG:HA	2.25	0.52
1:B:152:VAL:HG13	1:B:179:ILE:HD13	1.92	0.51
7:N:103:ILE:HG12	7:N:213:ALA:HB3	1.92	0.51
1:B:135:VAL:HG22	1:B:230:VAL:HB	1.91	0.51
4:G:494:MET:HE3	2:C:249:PHE:HE2	1.73	0.51
3:F:267:THR:HG23	5:I:225:VAL:HG22	1.91	0.51
7:M:238:ILE:HG12	7:M:514:TRP:HB3	1.92	0.51
7:N:238:ILE:HG12	7:N:514:TRP:HB3	1.92	0.51
4:H:410:THR:HG22	4:H:440:MET:HG3	1.92	0.51
6:L:26:GLN:HG2	6:L:33:TYR:O	2.11	0.51
7:N:375:SER:HB3	7:N:402:VAL:HG23	1.92	0.51
1:A:79:ARG:HA	1:A:79:ARG:NE	2.26	0.51
4:H:587:LYS:HZ1	2:C:356:PHE:HB3	1.76	0.51
6:L:25:GLN:OE1	6:L:35:LYS:HG2	2.11	0.51
7:N:354:GLU:HB2	7:N:372:PRO:HB2	1.92	0.51
4:G:288:GLY:HA2	4:G:292:ARG:HH21	1.76	0.51
4:H:587:LYS:HZ3	2:C:356:PHE:HD1	1.56	0.51
3:E:190:ARG:HH12	3:E:238:LEU:HD12	1.76	0.51
4:G:508:GLU:H	4:G:511:LYS:HD2	1.76	0.51
4:H:434:LEU:HD13	4:H:436:GLU:HG3	1.93	0.51
4:H:579:LYS:HG2	4:H:580:LYS:HG3	1.93	0.50
2:D:196:VAL:HG22	2:D:295:VAL:HB	1.94	0.50
7:M:103:ILE:HG12	7:M:213:ALA:HB3	1.94	0.50
4:G:410:THR:HG22	4:G:440:MET:HG3	1.94	0.50
5:J:414:ILE:HG12	5:J:432:ILE:HD12	1.92	0.50
4:H:487:ALA:HA	4:H:564:LYS:HE3	1.93	0.50
6:K:26:GLN:HE21	6:K:32:ALA:HA	1.76	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:80:ASN:C	1:A:90:CYS:SG	2.95	0.50
1:A:27:ILE:HG23	1:A:73:PHE:HD2	1.77	0.50
4:G:558:ARG:HA	2:C:242:VAL:HB	1.92	0.50
1:A:292:PRO:HB2	2:D:359:SER:OG	2.12	0.50
4:H:587:LYS:NZ	2:C:356:PHE:HB3	2.27	0.50
6:L:24:VAL:HG21	6:L:63:ILE:HD11	1.94	0.49
2:D:254:ARG:HH12	4:H:521:VAL:HG11	1.77	0.49
3:E:198:THR:HB	3:E:272:LEU:HB3	1.94	0.49
3:E:246:ASP:HA	3:E:249:LYS:HB3	1.94	0.49
3:E:294:SER:HA	3:E:300:SER:HB3	1.95	0.49
6:K:118:LYS:HE3	6:K:168:GLU:HG2	1.93	0.49
1:B:86:ASP:C	1:B:88:GLU:H	2.21	0.49
4:H:524:ASN:HD22	4:H:526:LEU:HG	1.77	0.49
1:A:267:LEU:HA	1:B:178:LEU:HB3	1.94	0.49
1:A:57:ILE:HA	1:A:60:ILE:HD12	1.94	0.49
5:I:301:ARG:HB3	2:C:317:GLY:HA2	1.93	0.49
4:H:432:ARG:H	4:H:433:PRO:HD2	1.78	0.49
4:G:452:MET:HE2	5:I:341:LYS:HE2	1.94	0.49
6:K:27:ILE:HG13	6:K:28:ALA:H	1.77	0.49
2:C:196:VAL:HG22	2:C:295:VAL:HB	1.95	0.49
6:L:53:ARG:HD2	6:L:88:ARG:HG2	1.94	0.48
6:K:54:ARG:CG	6:K:54:ARG:NH1	2.75	0.48
1:B:118:ASP:HB3	2:C:307:PHE:CD1	2.48	0.48
5:I:302:TRP:CZ2	2:C:328:ARG:HG3	2.49	0.48
1:B:83:LEU:HD23	2:C:113:VAL:N	2.29	0.48
4:H:348:LYS:HA	4:H:351:ILE:HD12	1.95	0.48
1:B:76:PHE:CE2	2:C:125:LEU:HA	2.48	0.48
3:E:224:THR:HG22	3:E:268:VAL:HG22	1.95	0.48
4:G:401:VAL:HG22	4:G:427:ILE:HB	1.96	0.48
5:I:325:ILE:HD13	5:I:339:ILE:HD13	1.94	0.48
1:B:57:ILE:HA	1:B:60:ILE:HD12	1.96	0.48
4:G:427:ILE:HG12	4:G:452:MET:HB2	1.96	0.48
7:N:215:LEU:HD23	7:N:245:ILE:HB	1.96	0.48
1:B:112:ILE:HG22	1:B:138:LEU:HD21	1.96	0.48
2:D:44:THR:HA	2:D:47:LEU:HD12	1.95	0.48
4:G:348:LYS:HA	4:G:351:ILE:HD12	1.95	0.47
4:H:288:GLY:HA2	4:H:292:ARG:HH21	1.78	0.47
5:I:165:THR:HA	5:I:274:TYR:HB2	1.96	0.47
5:J:325:ILE:HD13	5:J:339:ILE:HD13	1.95	0.47
1:A:178:LEU:HB3	1:B:267:LEU:HA	1.95	0.47
1:B:195:PHE:HA	1:B:228:TYR:HB2	1.95	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:H:401:VAL:HG22	4:H:427:ILE:HB	1.96	0.47
5:J:83:ALA:HA	5:J:86:ILE:HD12	1.96	0.47
1:B:131:TYR:HB3	1:B:161:GLN:HE22	1.79	0.47
7:M:424:PRO:HB3	7:M:494:GLU:HG3	1.96	0.47
4:G:383:ASP:O	4:G:387:ILE:HG12	2.14	0.47
7:N:337:VAL:HA	7:N:399:GLY:HA2	1.96	0.47
1:A:182:SER:HB2	1:B:212:GLY:HA3	1.97	0.47
5:J:64:LEU:HA	5:J:67:LEU:HD12	1.97	0.47
1:B:87:TRP:CE3	6:K:75:ARG:NH2	2.83	0.47
4:G:539:ASN:HB2	4:G:540:PRO:HD3	1.97	0.47
4:G:561:GLU:HB2	4:G:564:LYS:HE2	1.97	0.47
4:H:383:ASP:O	4:H:387:ILE:HG12	2.14	0.47
5:I:32:LEU:HB2	5:I:136:SER:HA	1.97	0.47
5:I:37:GLU:C	5:I:39:ARG:H	2.23	0.47
1:A:212:GLY:HA3	1:B:182:SER:HB2	1.97	0.47
6:K:92:SER:HA	6:K:95:ILE:HD12	1.97	0.47
3:F:190:ARG:HH12	3:F:238:LEU:HD12	1.79	0.47
2:C:44:THR:HA	2:C:47:LEU:HD12	1.96	0.47
4:H:427:ILE:HG12	4:H:452:MET:HB2	1.97	0.47
6:L:59:ILE:HD13	6:L:62:LEU:HB2	1.95	0.47
2:D:317:GLY:HA2	5:J:301:ARG:HB3	1.97	0.46
4:G:472:LEU:HB2	4:G:505:VAL:HG22	1.96	0.46
5:I:64:LEU:HA	5:I:67:LEU:HD12	1.97	0.46
5:J:432:ILE:HG12	5:J:459:ASP:HB2	1.97	0.46
7:M:330:ILE:HB	6:K:205:LEU:HG	1.97	0.46
7:N:424:PRO:HB3	7:N:494:GLU:HG3	1.98	0.46
6:K:46:ILE:HG21	6:K:51:LEU:HD21	1.97	0.46
6:K:248:ILE:HG12	6:K:264:ILE:HG21	1.97	0.46
3:F:136:GLN:HG3	3:F:162:ARG:HH12	1.80	0.46
5:J:37:GLU:C	5:J:39:ARG:H	2.22	0.46
6:L:30:MET:O	6:L:48:LEU:CD1	2.47	0.46
5:J:165:THR:HA	5:J:274:TYR:HB2	1.98	0.46
6:K:53:ARG:HD2	6:K:88:ARG:CG	2.45	0.46
2:D:283:GLU:O	4:H:498:ARG:NH2	2.49	0.46
4:H:377:GLU:CD	6:K:61:LYS:HB3	2.40	0.46
2:D:328:ARG:HG3	5:J:302:TRP:CZ2	2.50	0.46
7:M:215:LEU:HD23	7:M:245:ILE:HB	1.97	0.46
7:M:337:VAL:HA	7:M:399:GLY:HA2	1.98	0.46
5:I:83:ALA:HA	5:I:86:ILE:HD12	1.97	0.46
2:D:328:ARG:HG3	5:J:302:TRP:HZ2	1.81	0.46
2:D:197:LEU:HD21	2:D:232:LYS:HD2	1.98	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:90:ARG:HH12	2:C:298:LEU:HD22	1.81	0.46
1:B:301:LYS:HD3	2:C:121:MET:N	2.31	0.45
5:I:48:PRO:HG2	5:I:51:LEU:HB2	1.97	0.45
5:I:302:TRP:HZ2	2:C:328:ARG:HG3	1.81	0.45
5:J:135:VAL:HG22	5:J:235:ILE:HG23	1.98	0.45
2:C:192:ASP:HB2	2:C:222:ASN:HD21	1.82	0.45
2:D:67:ILE:HA	2:D:70:LEU:HD12	1.97	0.45
6:L:63:ILE:HD12	6:L:63:ILE:C	2.42	0.45
5:J:32:LEU:HB2	5:J:136:SER:HA	1.98	0.45
6:L:59:ILE:HG12	6:L:62:LEU:HD12	1.97	0.45
6:K:31:GLY:HA2	6:K:48:LEU:HD23	1.98	0.45
2:C:67:ILE:HA	2:C:70:LEU:HD12	1.98	0.45
4:H:413:LEU:HA	4:H:416:ASN:HD22	1.82	0.45
1:B:27:ILE:HA	1:B:30:LEU:HD12	1.99	0.45
5:J:48:PRO:HG2	5:J:51:LEU:HB2	1.98	0.45
6:L:92:SER:HA	6:L:95:ILE:HD12	1.98	0.45
6:K:53:ARG:HD2	6:K:88:ARG:HG2	1.97	0.45
1:A:22:MET:HB2	1:A:23:PRO:HD3	1.99	0.45
3:F:224:THR:HG22	3:F:268:VAL:HG22	1.97	0.45
2:C:219:PHE:HA	2:C:223:THR:HG23	1.98	0.45
4:G:459:LEU:C	4:G:461:THR:H	2.25	0.45
6:K:45:MET:CE	6:K:45:MET:H	2.29	0.45
1:B:242:LEU:HD13	4:H:393:GLN:HG2	1.98	0.45
2:D:219:PHE:HA	2:D:223:THR:HG23	1.97	0.45
4:G:291:PRO:HA	4:G:294:ILE:HD12	1.99	0.45
6:L:248:ILE:HG12	6:L:264:ILE:HG21	1.99	0.45
4:G:377:GLU:HB3	6:L:61:LYS:HB3	1.99	0.44
5:I:414:ILE:HG12	5:I:432:ILE:HD12	1.98	0.44
2:C:89:ARG:HA	2:C:92:LEU:HD12	1.99	0.44
4:G:413:LEU:HA	4:G:416:ASN:HD22	1.83	0.44
4:G:561:GLU:CB	4:G:564:LYS:HE2	2.47	0.44
2:D:90:ARG:HH12	2:D:298:LEU:HD22	1.81	0.44
3:E:75:PRO:HG2	3:E:112:LEU:HD21	1.99	0.44
6:L:45:MET:H	6:L:45:MET:CE	2.30	0.44
6:K:8:PHE:HE2	6:K:109:HIS:HB2	1.82	0.44
6:K:45:MET:H	6:K:45:MET:HE2	1.82	0.44
4:G:284:TYR:HD1	4:G:286:ILE:H	1.66	0.44
1:A:131:TYR:HB2	1:A:165:LEU:HD13	1.99	0.44
1:B:22:MET:HB2	1:B:23:PRO:HD3	1.99	0.44
1:B:27:ILE:HG23	1:B:73:PHE:HD2	1.83	0.44
2:D:89:ARG:HA	2:D:92:LEU:HD12	2.00	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:192:ASP:HB2	2:D:222:ASN:HD21	1.81	0.44
5:I:135:VAL:HG22	5:I:235:ILE:HG23	2.00	0.44
6:L:45:MET:H	6:L:45:MET:HE2	1.82	0.44
6:L:88:ARG:CG	6:L:88:ARG:NH2	2.78	0.44
1:A:86:ASP:C	1:A:88:GLU:H	2.26	0.43
2:D:159:LYS:HA	2:D:162:ILE:HD12	2.00	0.43
4:H:503:VAL:HB	4:H:571:PRO:HA	2.01	0.43
7:M:142:TYR:HB2	7:M:319:ARG:HH12	1.83	0.43
1:B:283:LEU:HB3	1:B:291:THR:HA	1.99	0.43
5:I:459:ASP:H	5:I:466:ILE:HD12	1.83	0.43
2:C:42:LEU:HA	2:C:45:LEU:HD12	1.99	0.43
4:H:271:HIS:HA	4:H:272:PRO:HD3	1.87	0.43
7:M:216:LEU:HD23	7:M:246:ILE:HG12	2.01	0.43
3:F:239:LEU:HA	3:F:388:ASN:HA	2.01	0.43
7:N:254:MET:HE3	7:N:258:SER:HB3	1.99	0.43
3:E:239:LEU:HA	3:E:388:ASN:HA	2.00	0.43
4:G:517:GLN:HB2	4:G:522:THR:HG21	1.99	0.43
5:I:33:THR:HG22	5:I:50:CYS:SG	2.59	0.43
1:A:27:ILE:HA	1:A:30:LEU:HD12	2.00	0.43
1:B:86:ASP:OD1	1:B:86:ASP:N	2.47	0.43
5:J:57:VAL:HA	5:J:58:PRO:HD2	1.86	0.43
1:A:300:ILE:HD13	4:G:588:ASP:HB3	2.01	0.43
5:I:179:THR:HG22	5:I:203:PRO:HG2	2.01	0.43
1:B:153:VAL:HG13	1:B:165:LEU:HD23	2.01	0.43
2:D:242:VAL:HB	4:H:558:ARG:HA	2.00	0.43
1:B:188:ILE:H	1:B:188:ILE:HG13	1.71	0.42
6:L:188:VAL:HG22	6:L:264:ILE:HG23	2.00	0.42
7:N:216:LEU:HD23	7:N:246:ILE:HG12	2.01	0.42
2:D:42:LEU:HA	2:D:45:LEU:HD12	2.00	0.42
5:I:100:SER:HA	5:I:101:PRO:HD3	1.93	0.42
5:I:318:TYR:HA	5:I:328:GLU:HA	2.01	0.42
4:H:432:ARG:N	4:H:433:PRO:HD2	2.34	0.42
5:J:318:TYR:HA	5:J:328:GLU:HA	2.01	0.42
2:C:159:LYS:HA	2:C:162:ILE:HD12	2.00	0.42
1:B:230:VAL:HG22	1:B:284:ILE:HD12	2.01	0.42
5:J:459:ASP:H	5:J:466:ILE:HD12	1.84	0.42
2:C:179:LEU:HD13	2:C:293:PHE:HE2	1.84	0.42
1:B:141:HIS:HA	1:B:144:ASN:HB2	2.01	0.42
5:I:200:LEU:HA	5:I:201:PRO:HD3	1.92	0.42
6:L:59:ILE:HD13	6:L:59:ILE:O	2.19	0.42
1:A:75:ARG:HH11	1:A:303:TRP:HA	1.83	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:174:ILE:HA	1:A:175:PRO:HD3	1.94	0.42
1:B:242:LEU:HD23	1:B:242:LEU:H	1.85	0.42
4:H:508:GLU:H	4:H:511:LYS:HD2	1.85	0.42
2:C:186:LEU:HD22	2:C:259:ILE:HD11	2.00	0.42
2:D:190:THR:HG21	2:D:273:SER:HB3	2.02	0.42
5:I:238:CYS:HB3	5:I:242:VAL:HG21	2.01	0.42
5:J:143:ILE:HD12	5:J:282:ALA:HB2	2.00	0.42
5:J:214:ASP:HA	5:J:215:PRO:HD3	1.90	0.42
2:D:186:LEU:HD22	2:D:259:ILE:HD11	2.01	0.42
5:I:123:ASP:HB3	5:I:247:GLN:HE21	1.85	0.42
5:I:143:ILE:HD12	5:I:282:ALA:HB2	2.01	0.42
7:N:356:ARG:HB2	7:N:416:VAL:HG23	2.02	0.42
1:A:141:HIS:HA	1:A:144:ASN:HB2	2.01	0.42
4:G:459:LEU:HA	4:G:462:ILE:HG22	2.02	0.42
4:H:272:PRO:HA	4:H:275:LEU:HD12	2.01	0.42
2:C:90:ARG:HH22	2:C:298:LEU:HB2	1.84	0.42
2:D:346:ILE:H	2:D:346:ILE:HG13	1.76	0.42
3:F:253:LEU:HB2	5:I:213:ILE:HB	2.02	0.42
7:N:473:ALA:HB2	7:N:487:LEU:HD23	2.02	0.42
1:A:87:TRP:CE3	6:L:75:ARG:NH2	2.87	0.41
2:D:179:LEU:HD13	2:D:293:PHE:HE2	1.84	0.41
6:L:54:ARG:HD3	6:L:54:ARG:HA	1.77	0.41
1:B:75:ARG:NH1	1:B:303:TRP:CA	2.76	0.41
1:B:293:SER:HB3	2:C:362:TYR:HE1	1.85	0.41
4:G:455:LEU:HD13	2:C:220:PRO:HG3	2.02	0.41
5:I:298:PHE:HE2	5:I:308:LEU:HG	1.85	0.41
5:I:304:TYR:HB3	5:I:305:PRO:HD3	2.02	0.41
6:K:30:MET:O	6:K:48:LEU:HG	2.20	0.41
1:A:118:ASP:HB3	2:D:307:PHE:CD1	2.55	0.41
1:A:129:HIS:HD2	1:A:213:THR:HG22	1.86	0.41
2:D:333:THR:HG22	4:H:453:TYR:HB3	2.03	0.41
3:E:95:VAL:HB	3:E:155:LEU:HD22	2.02	0.41
5:I:214:ASP:HA	5:I:215:PRO:HD3	1.90	0.41
7:M:473:ALA:HB2	7:M:487:LEU:HD23	2.01	0.41
4:G:529:PRO:HA	4:G:560:PHE:HE1	1.86	0.41
7:M:312:SER:HA	7:M:313:PRO:HD3	1.93	0.41
7:N:226:GLN:HA	7:N:227:PRO:HD3	1.92	0.41
2:C:190:THR:HG21	2:C:273:SER:HB3	2.01	0.41
5:J:238:CYS:HB3	5:J:242:VAL:HG21	2.02	0.41
2:D:325:MET:HA	2:D:328:ARG:HB2	2.01	0.41
5:J:362:ILE:HG21	5:J:368:ILE:HD11	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:M:226:GLN:HA	7:M:227:PRO:HD3	1.91	0.41
1:A:86:ASP:OD1	1:A:86:ASP:N	2.51	0.41
7:M:503:ARG:HD3	7:M:512:ILE:HG21	2.02	0.41
7:N:503:ARG:HD3	7:N:512:ILE:HG21	2.01	0.41
1:A:257:THR:HG21	1:A:265:ASP:HB3	2.02	0.41
3:E:179:PRO:HA	3:E:180:PRO:HD3	1.75	0.41
4:G:431:SER:HA	4:G:456:ILE:HD11	2.02	0.41
4:G:478:LEU:HD12	4:G:482:PHE:HB2	2.01	0.41
6:L:34:VAL:HB	6:L:35:LYS:H	1.64	0.41
7:N:390:ALA:HB1	7:N:396:ILE:HD13	2.02	0.41
6:K:26:GLN:HG2	6:K:33:TYR:CD1	2.55	0.41
6:K:54:ARG:HD2	6:K:54:ARG:HA	1.71	0.41
1:B:81:LEU:CG	1:B:90:CYS:SG	2.87	0.41
1:B:87:TRP:HE3	6:K:75:ARG:NH2	2.19	0.41
1:B:148:ARG:HG3	5:I:335:GLN:HG3	2.01	0.41
2:D:90:ARG:HH22	2:D:298:LEU:HB2	1.85	0.41
4:H:382:ALA:HA	4:H:385:LEU:HD12	2.03	0.41
4:G:521:VAL:HG11	2:C:254:ARG:HH12	1.84	0.40
4:H:327:ILE:HG23	4:H:336:LEU:HD11	2.02	0.40
7:M:187:ARG:HH21	7:M:299:VAL:HA	1.85	0.40
6:K:27:ILE:HG23	6:K:64:ARG:NH2	2.33	0.40
6:L:24:VAL:CG1	6:L:65:VAL:HA	2.51	0.40
7:M:356:ARG:HB2	7:M:416:VAL:HG23	2.03	0.40
7:M:390:ALA:HB1	7:M:396:ILE:HD13	2.04	0.40
2:C:325:MET:HA	2:C:328:ARG:HB2	2.03	0.40
1:A:153:VAL:HG13	1:A:165:LEU:HD23	2.03	0.40
4:G:272:PRO:HA	4:G:275:LEU:HD12	2.02	0.40
4:G:284:TYR:CG	4:G:287:VAL:HG22	2.57	0.40
4:G:501:ILE:HA	4:G:502:PRO:HD3	1.89	0.40
4:H:368:CYS:HA	4:H:371:ILE:HD12	2.04	0.40
5:J:100:SER:HA	5:J:101:PRO:HD3	1.93	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	300/305 (98%)	260 (87%)	28 (9%)	12 (4%)	2	18
1	B	300/305 (98%)	261 (87%)	26 (9%)	13 (4%)	2	18
2	C	339/381 (89%)	302 (89%)	31 (9%)	6 (2%)	6	33
2	D	339/381 (89%)	302 (89%)	31 (9%)	6 (2%)	6	33
3	E	253/578 (44%)	218 (86%)	30 (12%)	5 (2%)	6	31
3	F	253/578 (44%)	222 (88%)	26 (10%)	5 (2%)	6	31
4	G	349/651 (54%)	298 (85%)	41 (12%)	10 (3%)	3	24
4	H	349/651 (54%)	300 (86%)	35 (10%)	14 (4%)	2	18
5	I	427/712 (60%)	388 (91%)	31 (7%)	8 (2%)	6	32
5	J	427/712 (60%)	387 (91%)	32 (8%)	8 (2%)	6	32
6	K	237/304 (78%)	199 (84%)	29 (12%)	9 (4%)	2	19
6	L	237/304 (78%)	199 (84%)	29 (12%)	9 (4%)	2	19
7	M	398/527 (76%)	347 (87%)	47 (12%)	4 (1%)	12	47
7	N	398/527 (76%)	351 (88%)	43 (11%)	4 (1%)	12	47
8	O	15/285 (5%)	12 (80%)	2 (13%)	1 (7%)	1	12
8	P	15/285 (5%)	12 (80%)	2 (13%)	1 (7%)	1	12
All	All	4636/7486 (62%)	4058 (88%)	463 (10%)	115 (2%)	6	26

All (115) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	292	PRO
1	B	158	PRO
1	B	292	PRO
4	H	487	ALA
5	I	202	LEU
5	J	202	LEU
6	L	62	LEU
1	A	16	GLU
1	A	18	THR
1	A	158	PRO
1	B	16	GLU
2	D	276	SER
3	E	100	GLU
3	F	100	GLU

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Mol	Chain	Res	Type
4	G	487	ALA
4	G	586	SER
4	H	536	ASP
4	H	537	TYR
5	I	173	THR
5	J	173	THR
7	M	164	PHE
7	M	507	LYS
7	N	164	PHE
7	N	507	LYS
6	K	62	LEU
2	C	276	SER
1	A	38	THR
1	A	61	PRO
1	A	189	ASP
1	A	291	THR
1	B	38	THR
1	B	61	PRO
1	B	267	LEU
1	B	291	THR
3	E	309	GLN
3	F	160	LEU
4	G	537	TYR
4	G	548	GLY
4	H	548	GLY
5	I	112	ALA
5	I	459	ASP
5	I	464	VAL
5	J	112	ALA
5	J	459	ASP
6	L	53	ARG
6	L	132	TRP
7	M	383	GLU
7	M	497	GLU
7	N	383	GLU
7	N	497	GLU
6	K	132	TRP
1	A	267	LEU
1	B	18	THR
1	B	189	ASP
1	B	254	LEU
2	D	239	GLU

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Mol	Chain	Res	Type
2	D	275	ASN
2	D	324	ARG
2	D	337	ILE
3	E	160	LEU
3	E	238	LEU
3	F	238	LEU
3	F	309	GLN
4	G	289	SER
4	H	248	GLU
4	H	265	LEU
4	H	289	SER
4	H	460	ASP
4	H	539	ASN
4	H	579	LYS
5	I	26	ARG
5	I	38	THR
5	I	311	ASN
5	J	26	ARG
5	J	38	THR
5	J	311	ASN
5	J	464	VAL
6	K	64	ARG
2	C	117	LEU
2	C	239	GLU
2	C	275	ASN
2	C	324	ARG
2	C	337	ILE
1	A	254	LEU
1	B	87	TRP
2	D	117	LEU
4	G	242	VAL
4	G	248	GLU
4	G	265	LEU
4	G	555	ILE
4	H	242	VAL
4	H	522	THR
4	H	555	ILE
6	L	6	CYS
6	L	29	GLU
6	K	6	CYS
6	K	29	GLU
3	E	152	GLY

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Mol	Chain	Res	Type
4	G	540	PRO
1	A	253	PRO
1	B	253	PRO
4	H	540	PRO
6	K	65	VAL
6	L	34	VAL
6	L	226	PRO
8	O	129	LEU
6	K	34	VAL
1	A	212	GLY
3	F	152	GLY
6	L	63	ILE
8	P	129	LEU
1	B	212	GLY
6	L	31	GLY
6	K	31	GLY
6	K	226	PRO

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	257/265 (97%)	236 (92%)	21 (8%)	10	31
1	B	257/265 (97%)	236 (92%)	21 (8%)	10	31
2	C	286/338 (85%)	266 (93%)	20 (7%)	14	36
2	D	286/338 (85%)	266 (93%)	20 (7%)	14	36
3	E	249/529 (47%)	243 (98%)	6 (2%)	43	63
3	F	249/529 (47%)	242 (97%)	7 (3%)	38	59
4	G	305/561 (54%)	293 (96%)	12 (4%)	28	50
4	H	305/561 (54%)	288 (94%)	17 (6%)	19	42
5	I	389/649 (60%)	371 (95%)	18 (5%)	24	46
5	J	389/649 (60%)	370 (95%)	19 (5%)	22	45
6	K	218/273 (80%)	192 (88%)	26 (12%)	5	19

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
6	L	218/273 (80%)	193 (88%)	25 (12%)	5	20
7	M	319/449 (71%)	306 (96%)	13 (4%)	27	49
7	N	319/449 (71%)	305 (96%)	14 (4%)	25	47
8	O	16/246 (6%)	15 (94%)	1 (6%)	16	38
8	P	16/246 (6%)	15 (94%)	1 (6%)	16	38
All	All	4078/6620 (62%)	3837 (94%)	241 (6%)	19	41

All (241) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	17	ASP
1	A	21	THR
1	A	24	ILE
1	A	37	LYS
1	A	54	GLU
1	A	56	LEU
1	A	81	LEU
1	A	86	ASP
1	A	126	ILE
1	A	135	VAL
1	A	172	LYS
1	A	179	ILE
1	A	187	VAL
1	A	188	ILE
1	A	207	ILE
1	A	231	THR
1	A	232	GLU
1	A	237	VAL
1	A	247	LEU
1	A	290	LEU
1	A	297	GLU
1	B	17	ASP
1	B	24	ILE
1	B	37	LYS
1	B	54	GLU
1	B	56	LEU
1	B	83	LEU
1	B	86	ASP
1	B	126	ILE
1	B	135	VAL

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Mol	Chain	Res	Type
1	B	172	LYS
1	B	179	ILE
1	B	187	VAL
1	B	188	ILE
1	B	196	VAL
1	B	207	ILE
1	B	231	THR
1	B	232	GLU
1	B	237	VAL
1	B	247	LEU
1	B	290	LEU
1	B	297	GLU
2	D	22	ILE
2	D	40	ILE
2	D	160	ASP
2	D	161	LEU
2	D	168	ILE
2	D	198	LYS
2	D	199	PHE
2	D	206	ARG
2	D	222	ASN
2	D	223	THR
2	D	278	VAL
2	D	298	LEU
2	D	308	ASP
2	D	313	VAL
2	D	322	LEU
2	D	328	ARG
2	D	330	ARG
2	D	346	ILE
2	D	348	ILE
2	D	366	TRP
3	E	3	ILE
3	E	141	ILE
3	E	155	LEU
3	E	255	ILE
3	E	260	LEU
3	E	385	ILE
3	F	3	ILE
3	F	141	ILE
3	F	155	LEU
3	F	173	ASP

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Mol	Chain	Res	Type
3	F	255	ILE
3	F	260	LEU
3	F	385	ILE
4	G	257	ILE
4	G	286	ILE
4	G	342	ASN
4	G	408	VAL
4	G	412	LEU
4	G	414	LEU
4	G	424	ILE
4	G	429	VAL
4	G	456	ILE
4	G	516	VAL
4	G	550	LEU
4	G	554	PHE
4	H	257	ILE
4	H	286	ILE
4	H	290	ILE
4	H	296	MET
4	H	317	ARG
4	H	342	ASN
4	H	412	LEU
4	H	424	ILE
4	H	429	VAL
4	H	434	LEU
4	H	456	ILE
4	H	478	LEU
4	H	498	ARG
4	H	501	ILE
4	H	554	PHE
4	H	576	ILE
4	H	587	LYS
5	I	41	MET
5	I	59	LEU
5	I	60	ILE
5	I	63	THR
5	I	88	ASP
5	I	89	TYR
5	I	113	ARG
5	I	122	LEU
5	I	127	ILE
5	I	163	ILE

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Mol	Chain	Res	Type
5	I	181	GLU
5	I	213	ILE
5	I	231	ILE
5	I	273	ILE
5	I	278	THR
5	I	333	LEU
5	I	339	ILE
5	I	424	MET
5	J	41	MET
5	J	59	LEU
5	J	60	ILE
5	J	63	THR
5	J	77	LEU
5	J	88	ASP
5	J	89	TYR
5	J	113	ARG
5	J	122	LEU
5	J	127	ILE
5	J	163	ILE
5	J	173	THR
5	J	213	ILE
5	J	231	ILE
5	J	273	ILE
5	J	278	THR
5	J	333	LEU
5	J	339	ILE
5	J	424	MET
6	L	19	ILE
6	L	39	TYR
6	L	42	ILE
6	L	45	MET
6	L	46	ILE
6	L	49	SER
6	L	50	GLU
6	L	51	LEU
6	L	59	ILE
6	L	63	ILE
6	L	76	VAL
6	L	79	GLU
6	L	88	ARG
6	L	97	LYS
6	L	123	LEU

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Mol	Chain	Res	Type
6	L	137	LYS
6	L	143	GLU
6	L	145	PHE
6	L	163	LYS
6	L	168	GLU
6	L	169	LEU
6	L	235	LEU
6	L	244	LEU
6	L	251	ILE
6	L	264	ILE
7	M	228	GLN
7	M	311	ILE
7	M	318	ILE
7	M	353	ILE
7	M	354	GLU
7	M	368	ILE
7	M	371	LYS
7	M	373	ILE
7	M	395	LEU
7	M	432	ILE
7	M	443	VAL
7	M	462	LEU
7	M	508	HIS
8	O	141	ILE
7	N	228	GLN
7	N	311	ILE
7	N	318	ILE
7	N	330	ILE
7	N	353	ILE
7	N	354	GLU
7	N	368	ILE
7	N	371	LYS
7	N	373	ILE
7	N	395	LEU
7	N	406	LEU
7	N	432	ILE
7	N	462	LEU
7	N	508	HIS
8	P	141	ILE
6	K	19	ILE
6	K	39	TYR
6	K	42	ILE

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Mol	Chain	Res	Type
6	K	45	MET
6	K	46	ILE
6	K	49	SER
6	K	50	GLU
6	K	51	LEU
6	K	53	ARG
6	K	54	ARG
6	K	63	ILE
6	K	76	VAL
6	K	79	GLU
6	K	88	ARG
6	K	97	LYS
6	K	123	LEU
6	K	137	LYS
6	K	143	GLU
6	K	145	PHE
6	K	163	LYS
6	K	168	GLU
6	K	169	LEU
6	K	235	LEU
6	K	244	LEU
6	K	251	ILE
6	K	264	ILE
2	C	22	ILE
2	C	40	ILE
2	C	160	ASP
2	C	161	LEU
2	C	168	ILE
2	C	198	LYS
2	C	199	PHE
2	C	206	ARG
2	C	222	ASN
2	C	223	THR
2	C	278	VAL
2	C	298	LEU
2	C	308	ASP
2	C	313	VAL
2	C	322	LEU
2	C	328	ARG
2	C	330	ARG
2	C	346	ILE
2	C	348	ILE

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Mol	Chain	Res	Type
2	C	366	TRP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (90) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	171	GLN
1	A	277	GLN
1	B	161	GLN
1	B	277	GLN
2	D	19	ASN
2	D	58	ASN
2	D	61	ASN
2	D	72	ASN
2	D	156	GLN
2	D	222	ASN
2	D	237	ASN
2	D	335	ASN
2	D	336	GLN
2	D	352	ASN
3	E	86	GLN
3	E	156	GLN
3	E	181	GLN
3	E	262	ASN
3	E	274	ASN
3	E	309	GLN
3	E	310	GLN
3	E	312	GLN
3	E	313	ASN
3	E	388	ASN
3	E	399	ASN
3	F	86	GLN
3	F	156	GLN
3	F	181	GLN
3	F	186	GLN
3	F	262	ASN
3	F	274	ASN
3	F	309	GLN
3	F	313	ASN
3	F	388	ASN
3	F	399	ASN
4	G	271	HIS
4	G	416	ASN

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Mol	Chain	Res	Type
4	G	534	ASN
4	H	253	ASN
4	H	416	ASN
4	H	480	ASN
4	H	539	ASN
4	H	574	ASN
5	I	28	GLN
5	I	212	GLN
5	I	228	ASN
5	I	247	GLN
5	I	359	ASN
5	I	423	ASN
5	J	28	GLN
5	J	96	ASN
5	J	212	GLN
5	J	228	ASN
5	J	247	GLN
5	J	359	ASN
5	J	423	ASN
6	L	11	ASN
7	M	98	GLN
7	M	144	ASN
7	M	221	ASN
7	M	226	GLN
7	M	295	ASN
7	M	324	ASN
7	M	465	ASN
7	M	508	HIS
8	O	140	ASN
7	N	98	GLN
7	N	144	ASN
7	N	197	HIS
7	N	295	ASN
7	N	324	ASN
7	N	465	ASN
7	N	508	HIS
8	P	140	ASN
6	K	11	ASN
6	K	26	GLN
6	K	60	GLN
6	K	68	ASN
6	K	103	GLN

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
2	C	19	ASN
2	C	58	ASN
2	C	61	ASN
2	C	72	ASN
2	C	156	GLN
2	C	221	ASN
2	C	222	ASN
2	C	335	ASN
2	C	336	GLN
2	C	352	ASN
2	C	357	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

2 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	$\# Z > 2$
6	SEP	K	52	6	8,9,10	0.89	0	7,12,14	1.24	0
6	SEP	L	52	6	8,9,10	0.80	0	7,12,14	1.14	0

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
6	SEP	K	52	6	-	6/6/8/10	-
6	SEP	L	52	6	-	6/6/8/10	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (12) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	L	52	SEP	C-CA-CB-OG
6	L	52	SEP	CA-CB-OG-P
6	L	52	SEP	CB-OG-P-O2P
6	L	52	SEP	CB-OG-P-O3P
6	K	52	SEP	C-CA-CB-OG
6	K	52	SEP	CB-OG-P-O2P
6	K	52	SEP	CB-OG-P-O3P
6	L	52	SEP	CB-OG-P-O1P
6	K	52	SEP	CB-OG-P-O1P
6	L	52	SEP	N-CA-CB-OG
6	K	52	SEP	N-CA-CB-OG
6	K	52	SEP	CA-CB-OG-P

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

There are no ligands in this entry.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

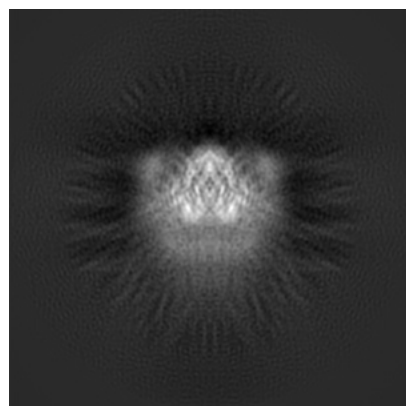
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-4544. These allow visual inspection of the internal detail of the map and identification of artifacts.

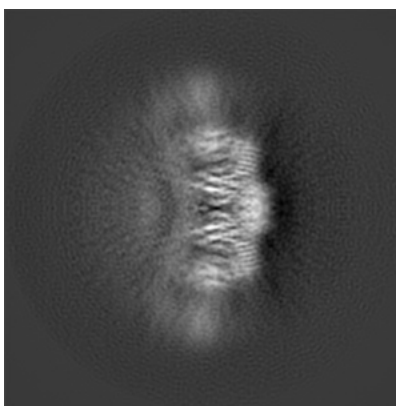
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

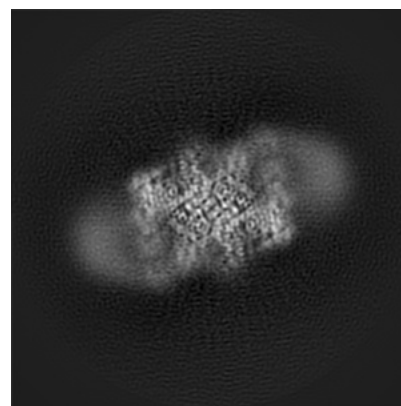
6.1.1 Primary map



X

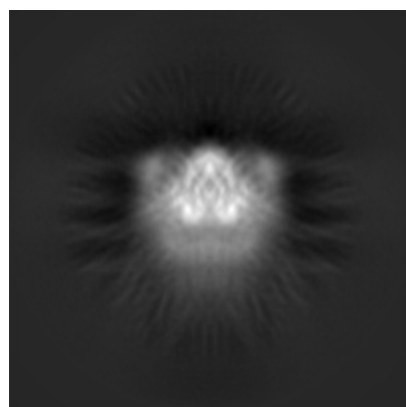


Y

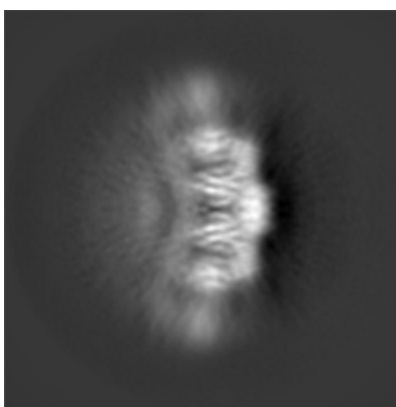


Z

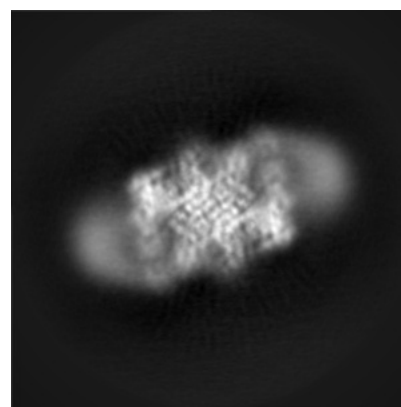
6.1.2 Raw map



X



Y

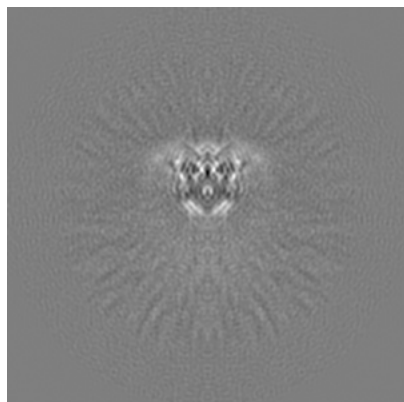


Z

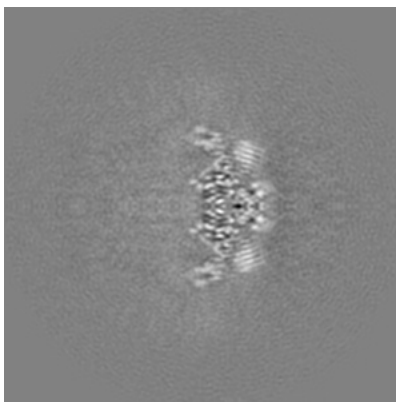
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

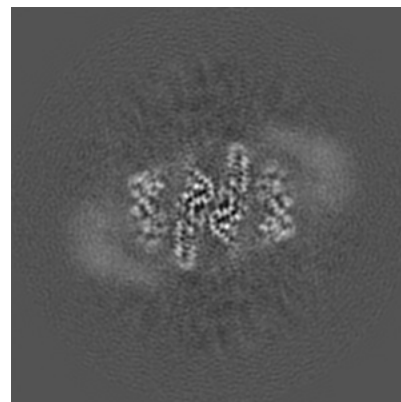
6.2.1 Primary map



X Index: 140

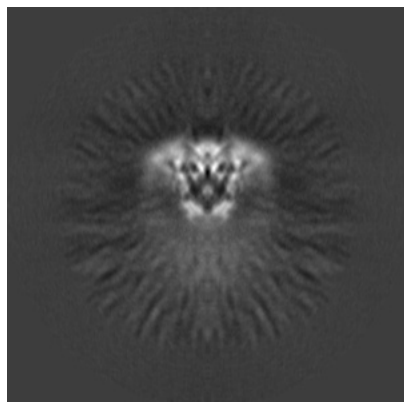


Y Index: 140

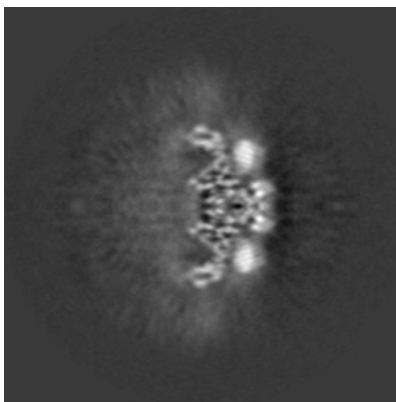


Z Index: 140

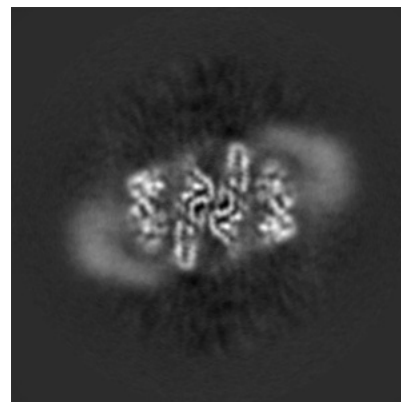
6.2.2 Raw map



X Index: 140



Y Index: 140

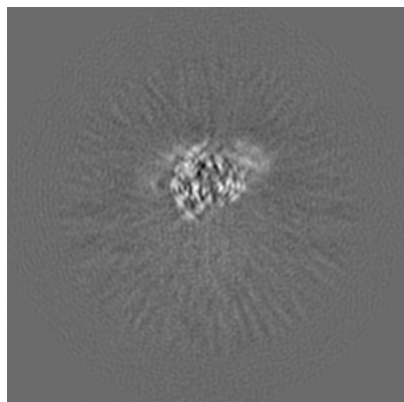


Z Index: 140

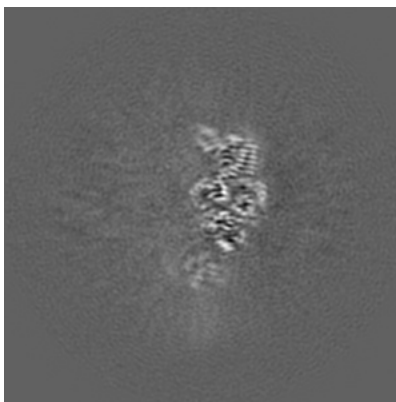
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

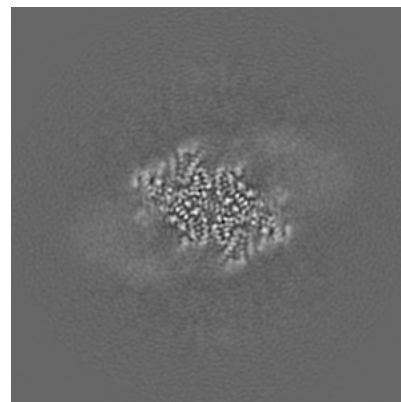
6.3.1 Primary map



X Index: 145

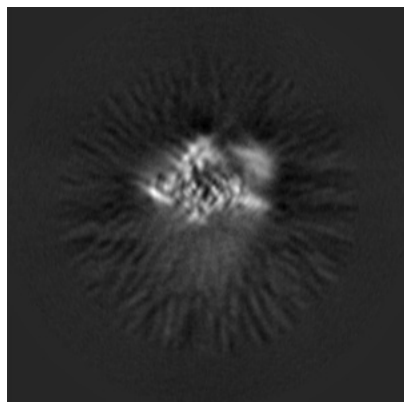


Y Index: 131

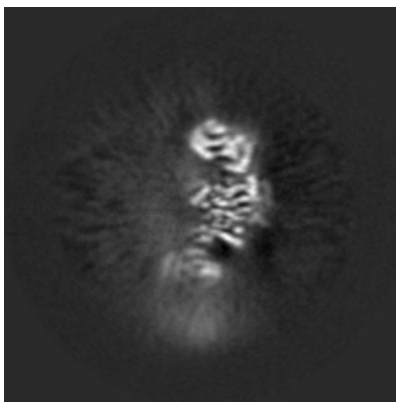


Z Index: 153

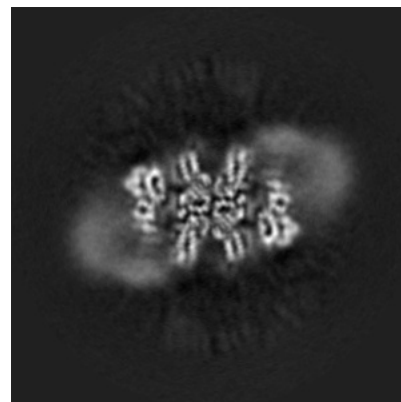
6.3.2 Raw map



X Index: 153



Y Index: 125

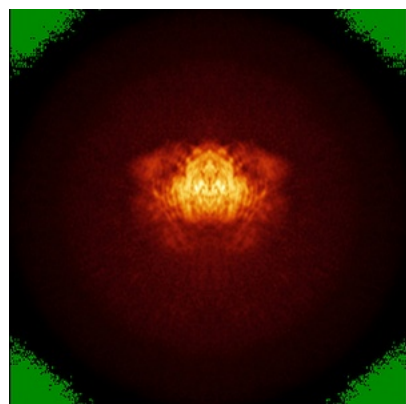


Z Index: 145

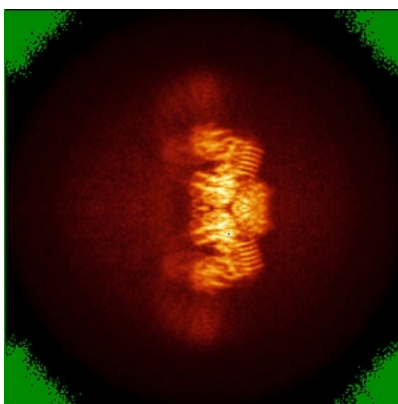
The images above show the largest variance slices of the map in three orthogonal directions.

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

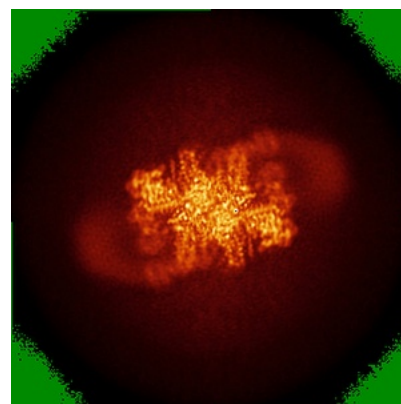
6.4.1 Primary map



X

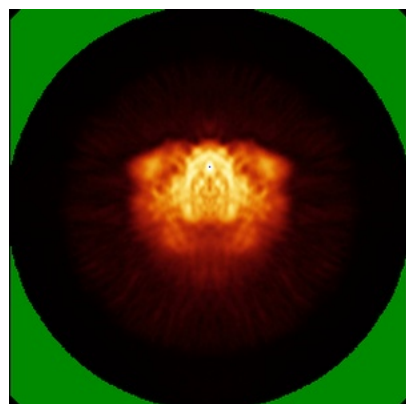


Y

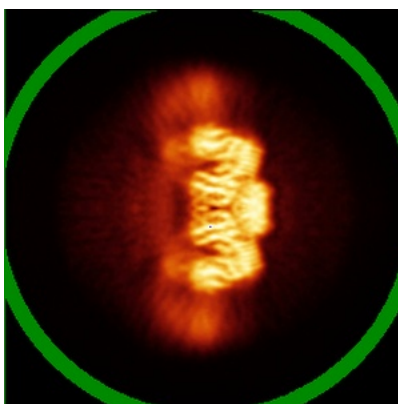


Z

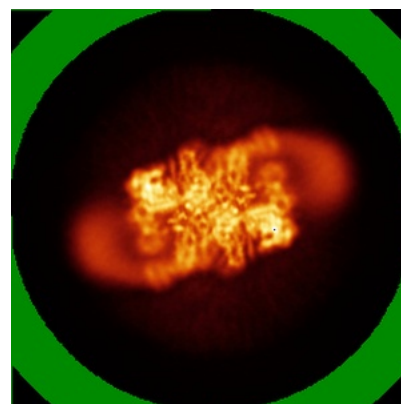
6.4.2 Raw map



X



Y

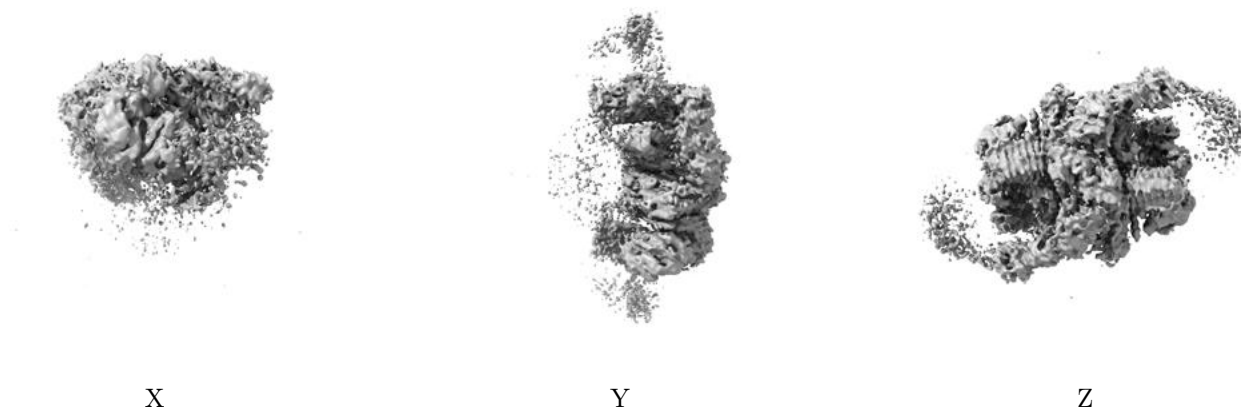


Z

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

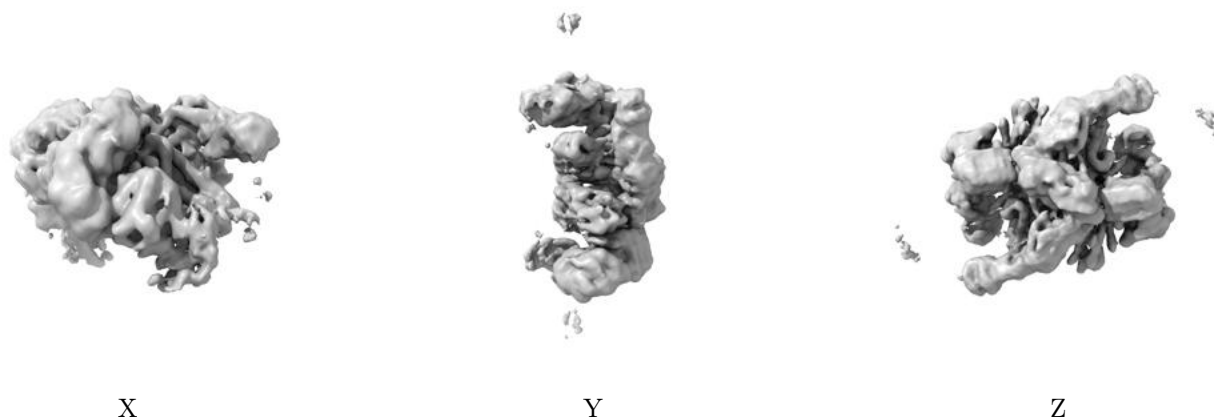
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.045. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



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

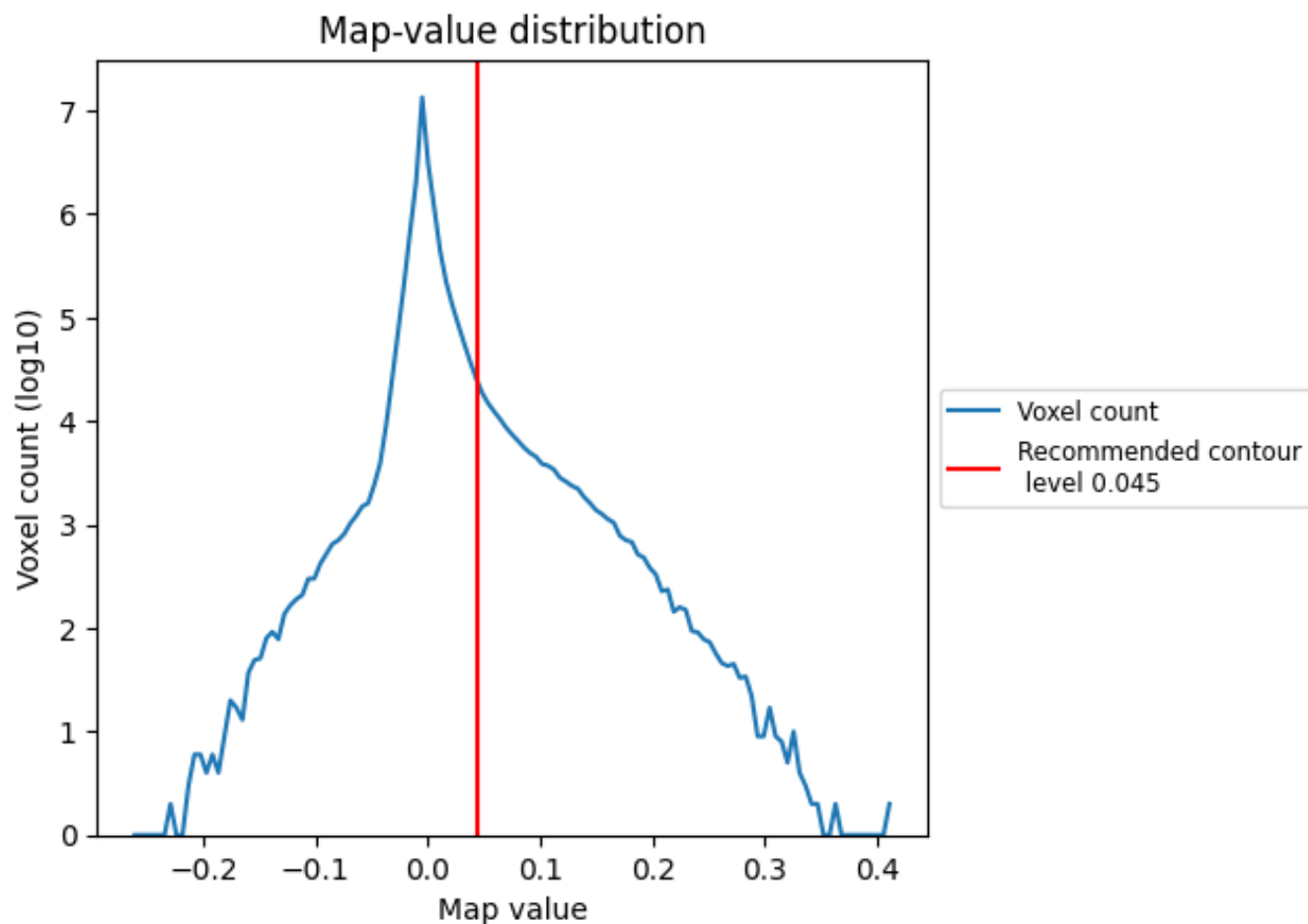
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

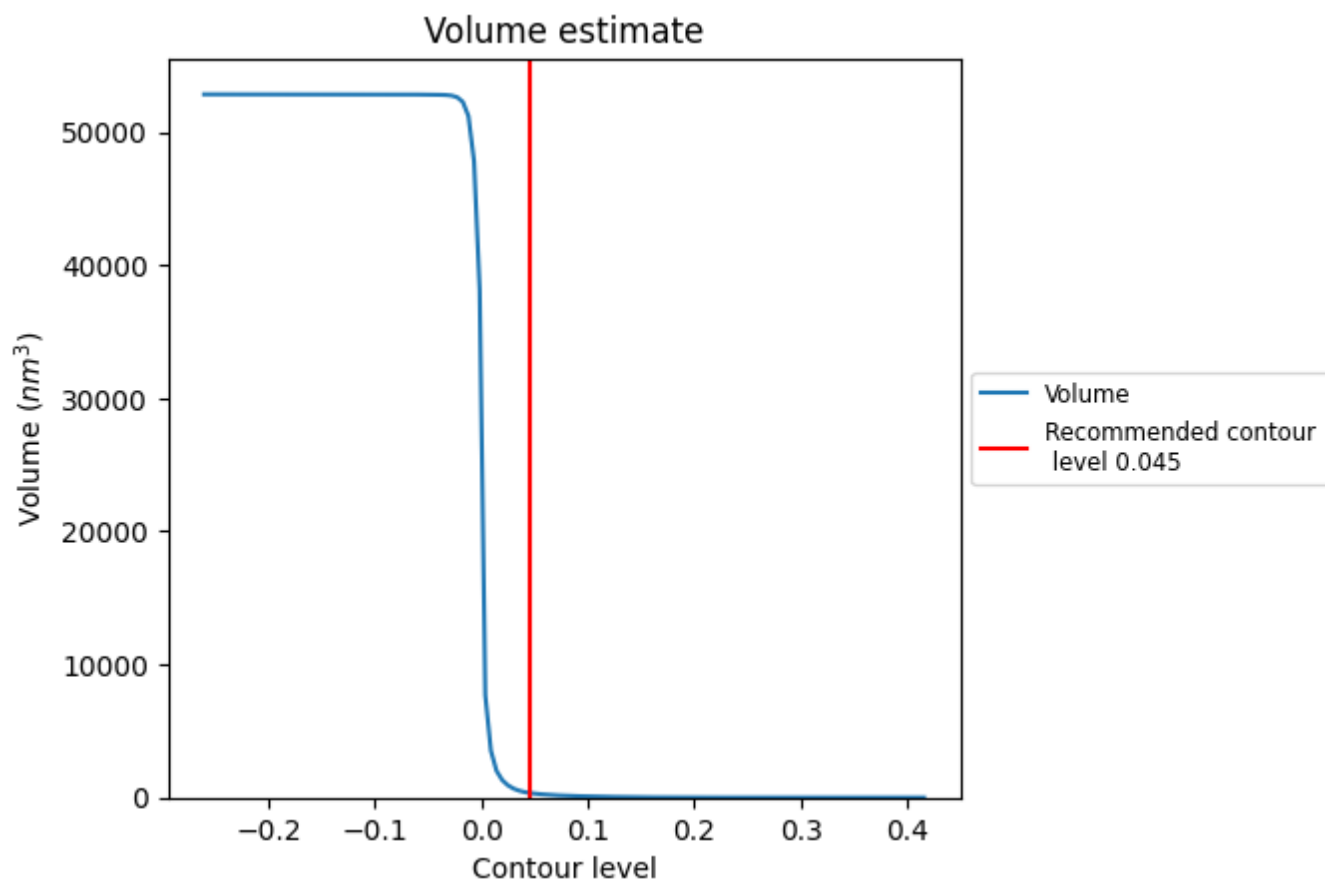
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

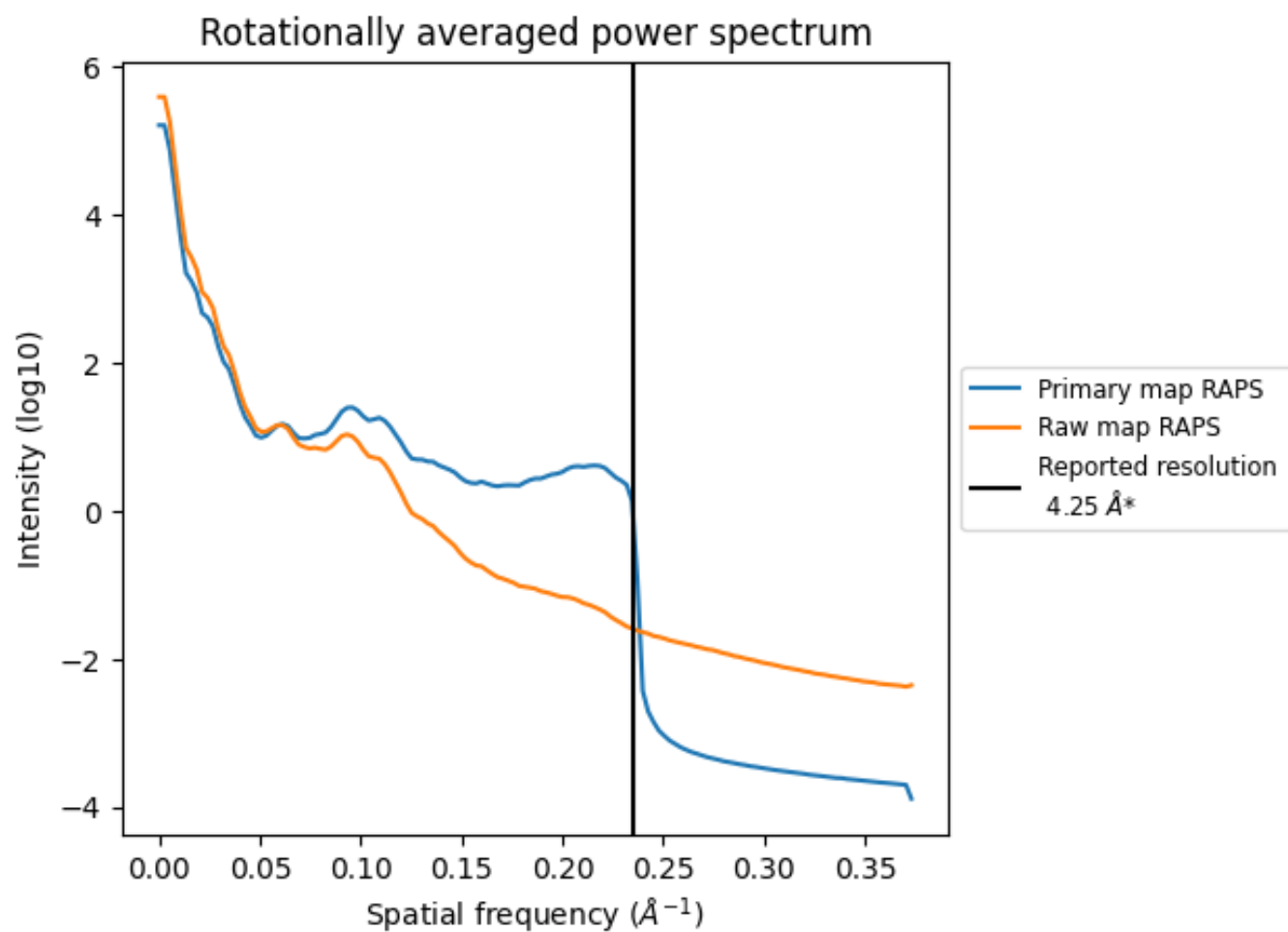
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 348 nm^3 ; this corresponds to an approximate mass of 314 kDa.

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

7.3 Rotationally averaged power spectrum ⓘ

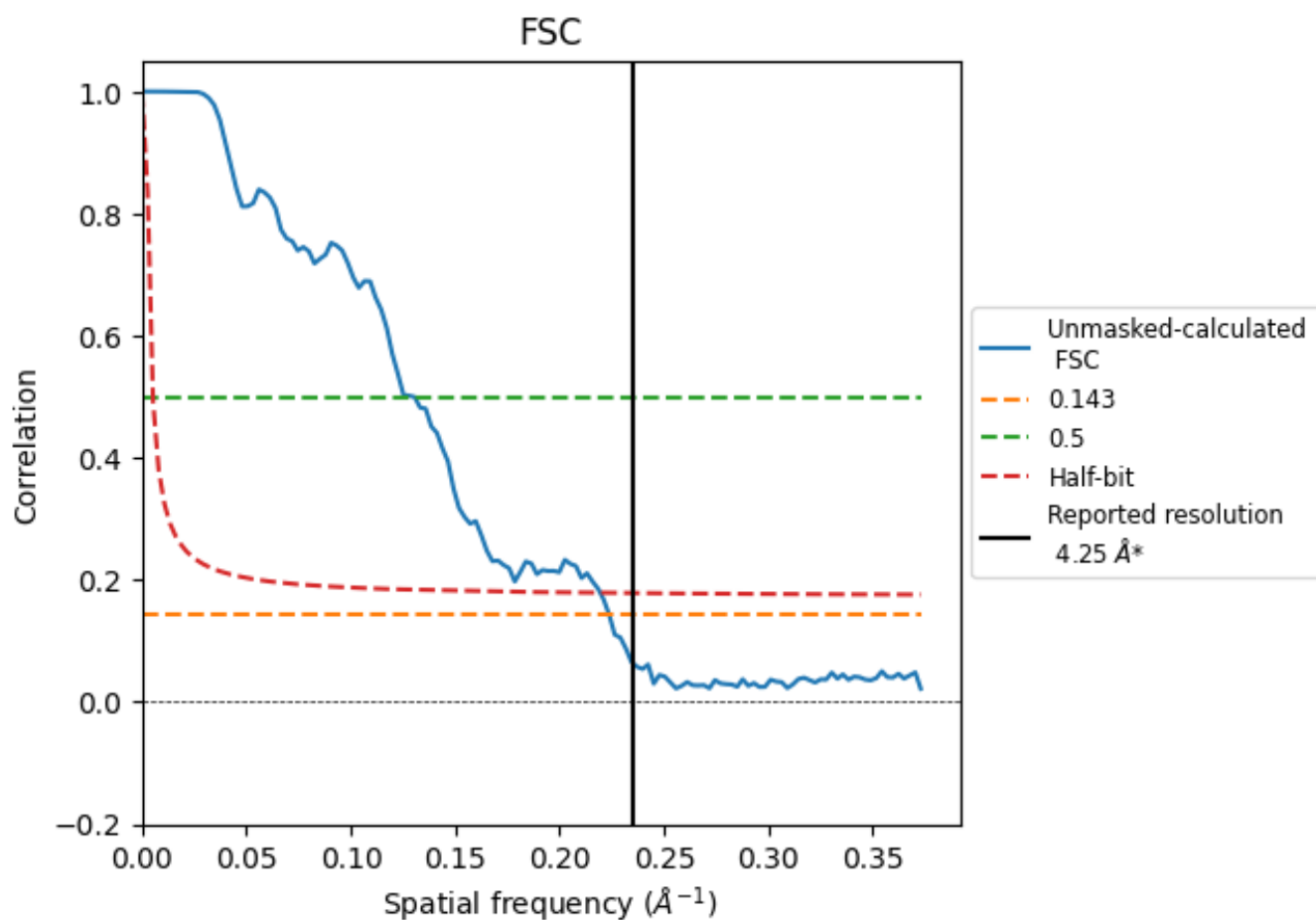


*Reported resolution corresponds to spatial frequency of $0.235 \text{ \AA}^{-1}$

8 Fourier-Shell correlation [i](#)

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

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of $0.235 \text{ \AA}^{-1}$

8.2 Resolution estimates [i](#)

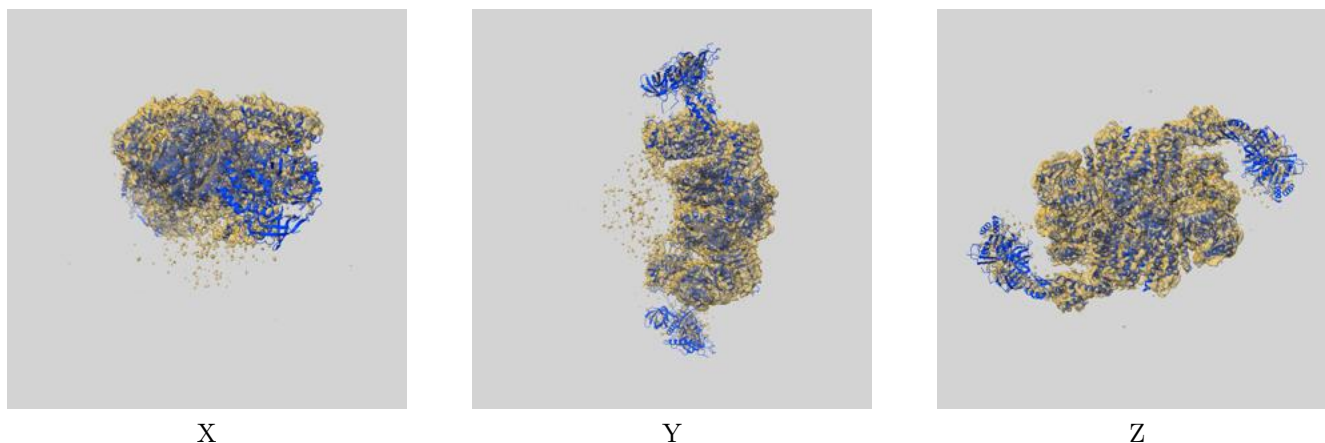
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	4.25	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	4.47	7.69	4.56

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

9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-4544 and PDB model 6QG1. Per-residue inclusion information can be found in section 3 on page 6.

9.1 Map-model overlay [i](#)



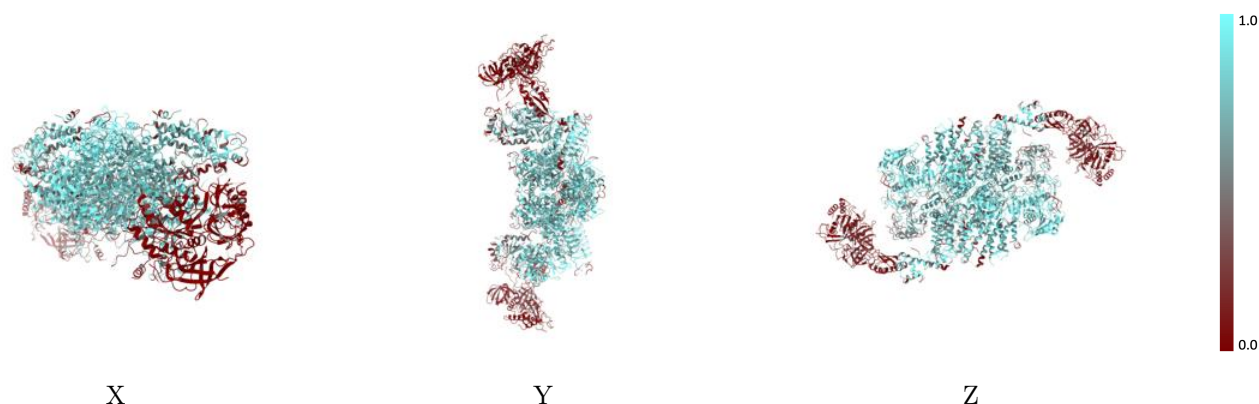
The images above show the 3D surface view of the map at the recommended contour level 0.045 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2 Q-score mapped to coordinate model [i](#)



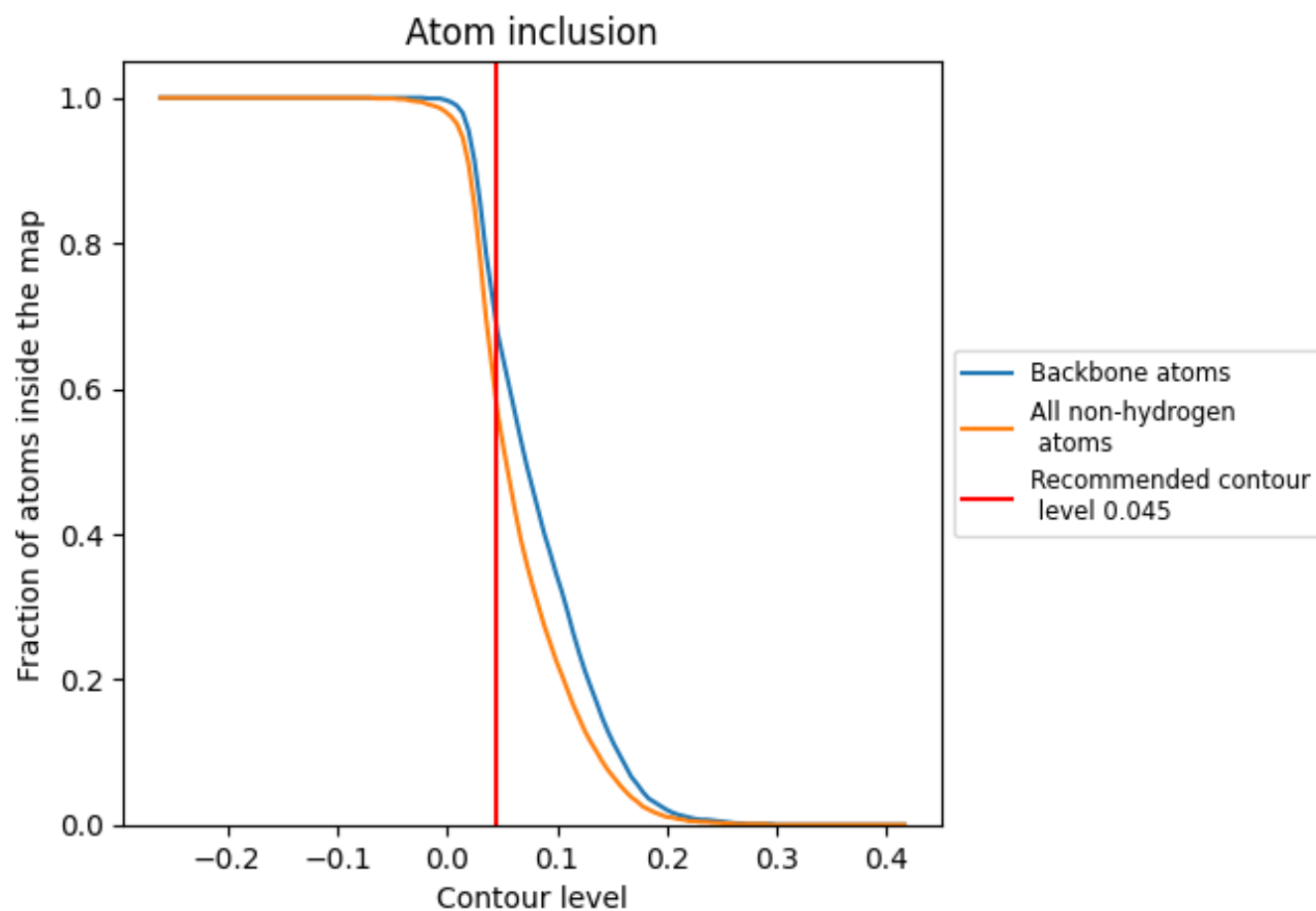
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

9.3 Atom inclusion mapped to coordinate model [i](#)



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.045).

9.4 Atom inclusion [i](#)



At the recommended contour level, 68% of all backbone atoms, 57% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary ⓘ

The table lists the average atom inclusion at the recommended contour level (0.045) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.5750	0.1940
A	0.7830	0.2250
B	0.7810	0.2210
C	0.7390	0.2780
D	0.7410	0.2780
E	0.5190	0.1550
F	0.5180	0.1590
G	0.7130	0.2730
H	0.7150	0.2770
I	0.8120	0.2540
J	0.8130	0.2540
K	0.4370	0.0870
L	0.4280	0.0850
M	0.0400	0.0570
N	0.0420	0.0520
O	0.0290	0.1700
P	0.0070	0.1350

1.0

0.0

<0.0