



## Full wwPDB EM Validation Report ⓘ

Nov 9, 2025 – 06:35 am GMT

PDB ID : 9QXS / pdb\_00009qxs  
EMDB ID : EMD-53443  
Title : E. coli JetABC dimer in a DNA boarding state  
Authors : Roisne-Hamelin, F.; Gruber, S.  
Deposited on : 2025-04-16  
Resolution : 3.70 Å(reported)  
Based on initial models : 8bfm, ?, 8q72, 8as8

This is a Full wwPDB EM Validation Report for a publicly released PDB entry.

We welcome your comments at [validation@mail.wwpdb.org](mailto: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>.

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The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

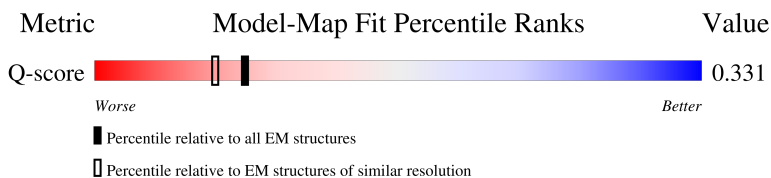
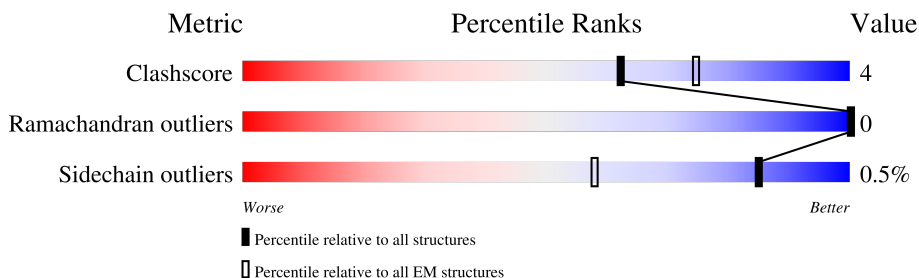
EMDB validation analysis : 0.0.1.dev129  
Mogul : 1.8.4, CSD as541be (2020)  
MolProbity : 4-5-2 with Phenix2.0  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
EM percentile statistics : 202505.v01 (Using data in the EMDB archive 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) : 2.46

# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:  
*ELECTRON MICROSCOPY*

The reported resolution of this entry is 3.70 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.





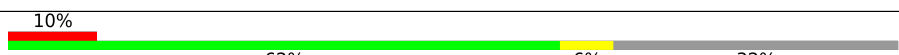

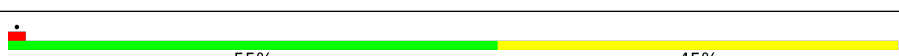
Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	210492	15764	-
Ramachandran outliers	207382	16835	-
Sidechain outliers	206894	16415	-
Q-score	-	25397	11569 ( 3.20 - 4.20 )

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  $\geq 3$ , 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	C	250	
1	D	250	
1	H	250	
1	I	250	

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Mol	Chain	Length	Quality of chain
2	E	503	 88% 11%
2	j	503	 88% 11%
3	A	1096	 10% 63% 5% 32%
3	B	1096	 16% 63% 5% 32%
3	F	1096	 10% 62% 6% 32%
3	G	1096	 16% 63% 6% 32%
4	P	60	 73% 27%
4	Q	60	 55% 45%

## 2 Entry composition [i](#)

There are 7 unique types of molecules in this entry. The entry contains 80334 atoms, of which 39548 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 JetB.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	H	N	O		
1	C	195	Total	C	H	N	O	0	0
			3173	991	1607	280	295		
1	D	195	Total	C	H	N	O	0	0
			3172	991	1606	280	295		
1	H	195	Total	C	H	N	O	0	0
			3173	991	1607	280	295		
1	I	195	Total	C	H	N	O	0	0
			3172	991	1606	280	295		

- Molecule 2 is a protein called JetA.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
2	E	498	Total	C	H	N	O	S	0	0
			8052	2512	4008	752	772	8		
2	j	498	Total	C	H	N	O	S	0	0
			8052	2512	4008	752	772	8		

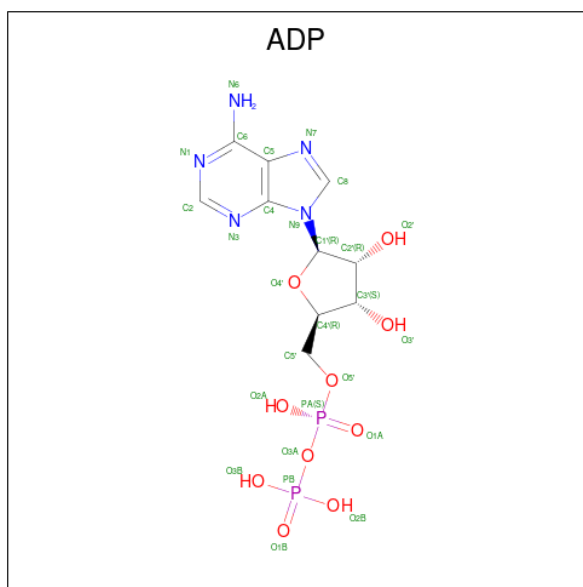
- Molecule 3 is a protein called JetC.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
3	A	750	Total	C	H	N	O	S	0	0
			11882	3710	5919	1093	1144	16		
3	B	750	Total	C	H	N	O	S	0	0
			11881	3710	5918	1093	1144	16		
3	F	750	Total	C	H	N	O	S	0	0
			11882	3710	5919	1093	1144	16		
3	G	750	Total	C	H	N	O	S	0	0
			11881	3710	5918	1093	1144	16		

- Molecule 4 is a DNA chain called Biotinylated circular plasmid DNA (1894-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			P
4	P	60	Total	C	H	N	O	P	0	0
			1919	600	692	210	358	59		
4	Q	60	Total	C	H	N	O	P	0	0
			1919	600	692	210	358	59		

- Molecule 5 is ADENOSINE-5'-DIPHOSPHATE (CCD ID: ADP) (formula:  $C_{10}H_{15}N_5O_{10}P_2$ ).

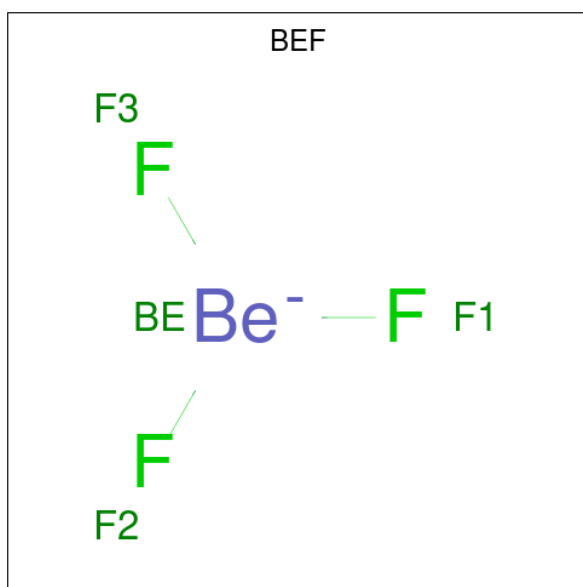


Mol	Chain	Residues	Atoms					AltConf	
			Total	C	H	N	O		P
5	A	1	Total	C	H	N	O	P	0
			39	10	12	5	10	2	
5	B	1	Total	C	H	N	O	P	0
			39	10	12	5	10	2	
5	F	1	Total	C	H	N	O	P	0
			39	10	12	5	10	2	
5	G	1	Total	C	H	N	O	P	0
			39	10	12	5	10	2	

- Molecule 6 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

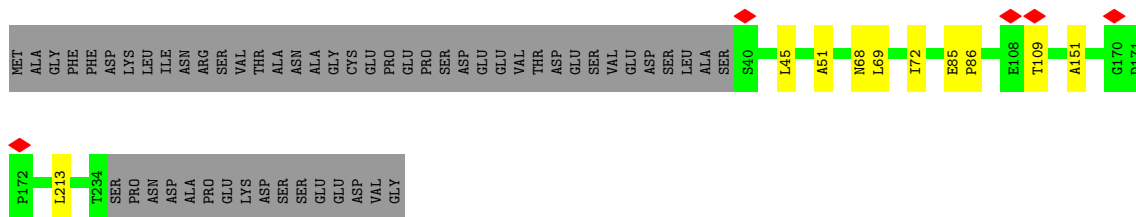
Mol	Chain	Residues	Atoms		AltConf
			Total	Mg	
6	A	2	Total	Mg	0
			2	2	
6	F	2	Total	Mg	0
			2	2	

- Molecule 7 is BERYLLIUM TRIFLUORIDE ION (CCD ID: BEF) (formula:  $BeF_3$ ).

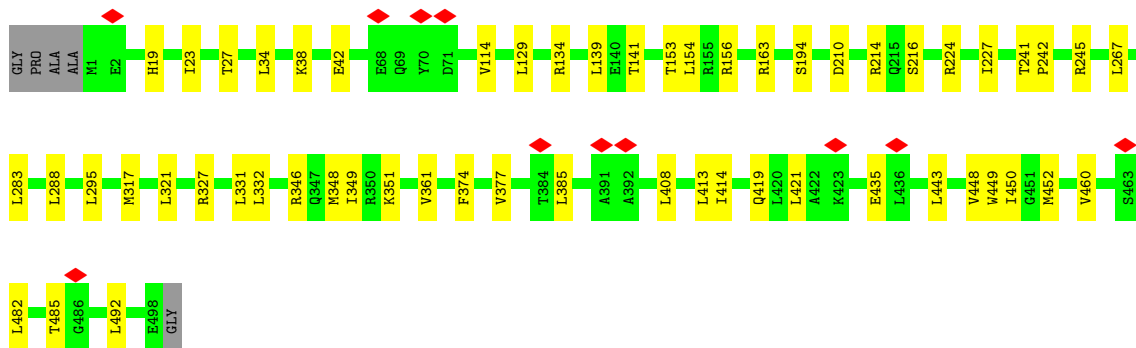
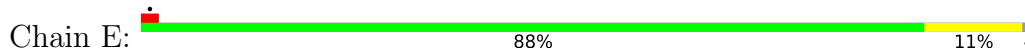


Mol	Chain	Residues	Atoms			AltConf
			Total	Be	F	
7	A	1	4	1	3	0
7	B	1	4	1	3	0
7	F	1	4	1	3	0
7	G	1	4	1	3	0

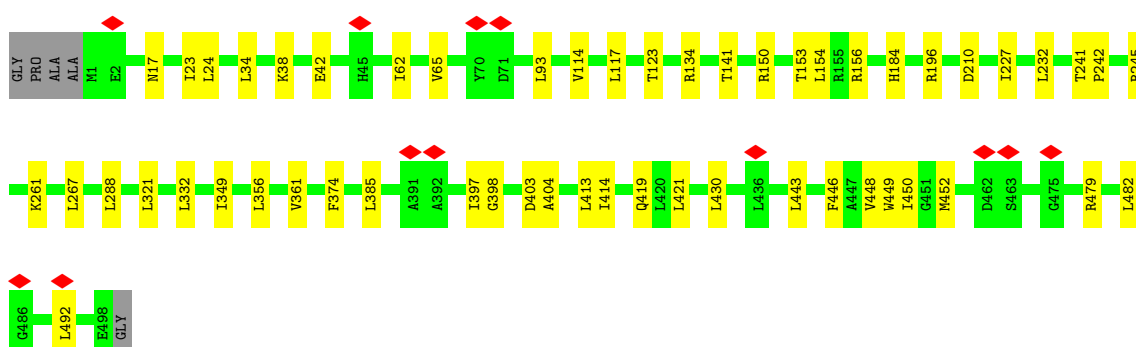
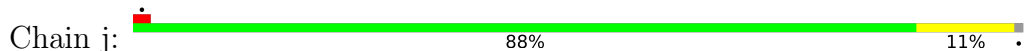




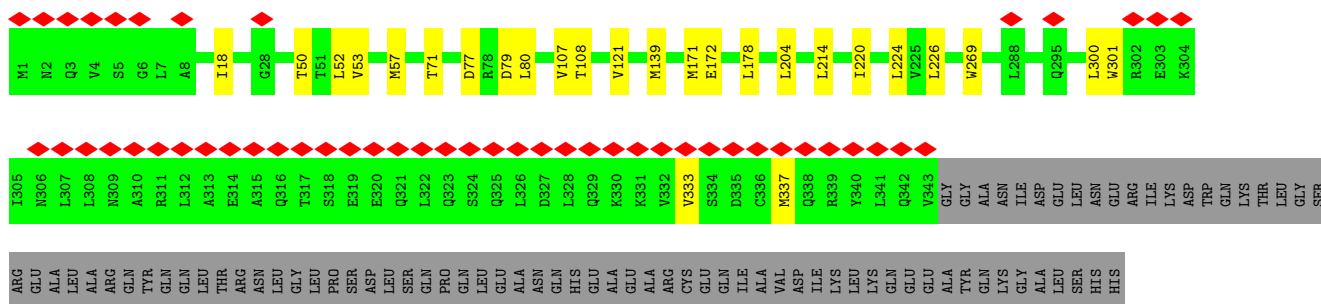
• Molecule 2: JetA



• Molecule 2: JetA

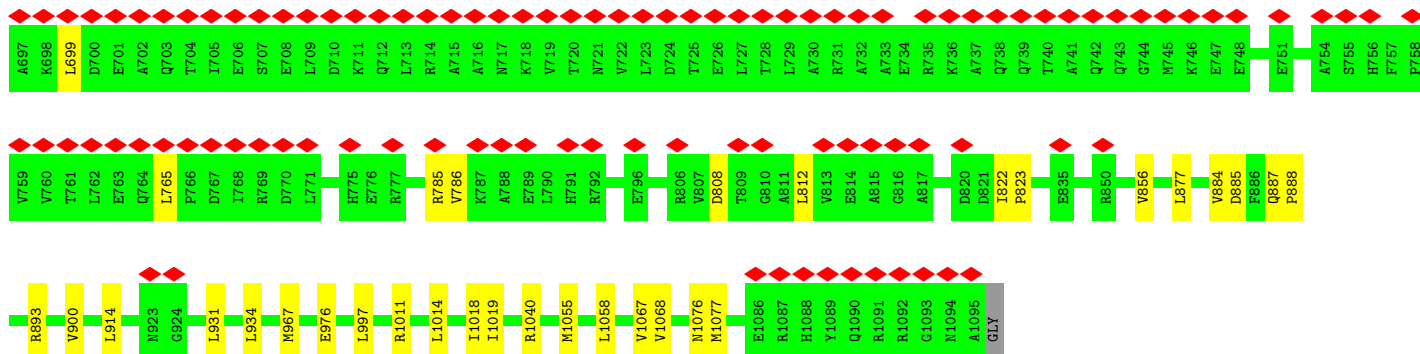


• Molecule 3: JetC

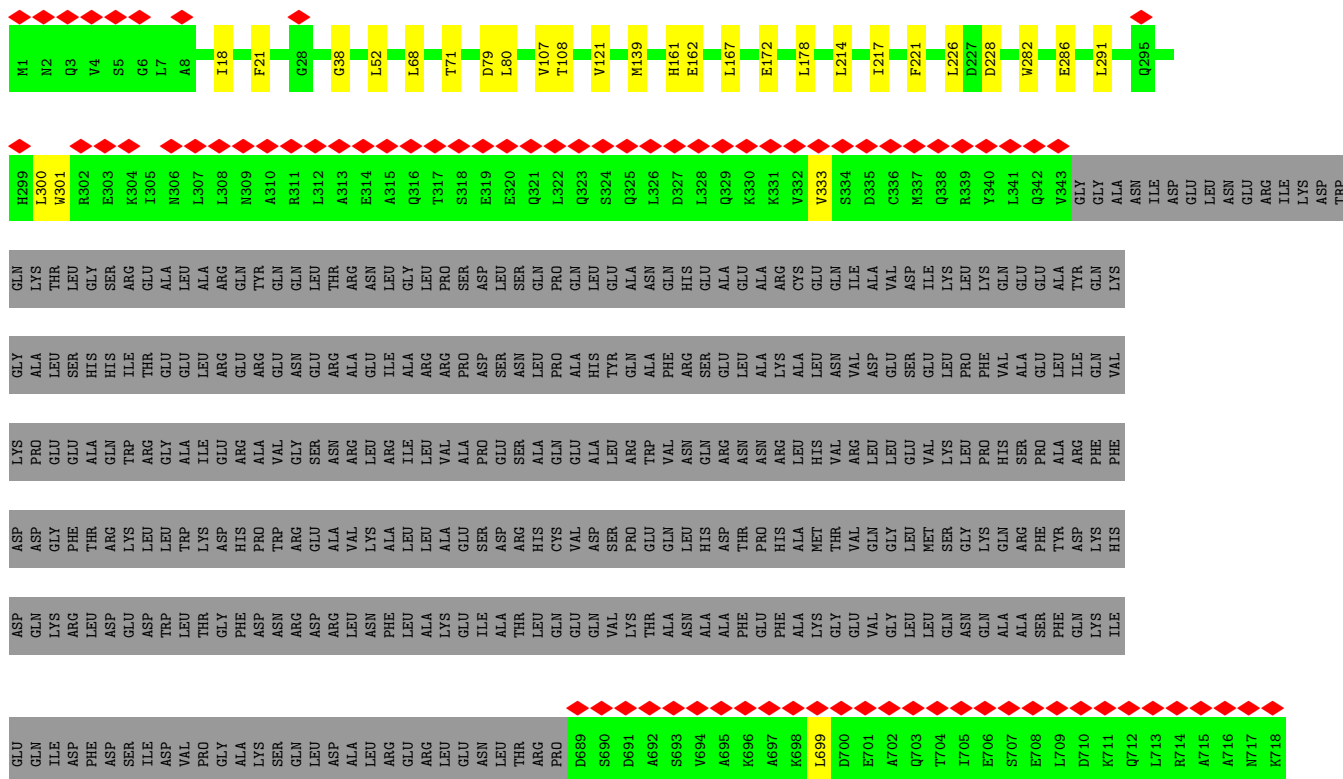








• Molecule 3: JetC



• Molecule 3: JetC





## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C2	Depositor
Number of particles used	57494	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	39.48	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	2400	Depositor
Magnification	Not provided	
Image detector	FEI FALCON IV (4k x 4k)	Depositor
Maximum map value	2.977	Depositor
Minimum map value	-1.971	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.061	Depositor
Recommended contour level	0.31	Depositor
Map size (Å)	466.56, 466.56, 466.56	wwPDB
Map dimensions	400, 400, 400	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.1664, 1.1664, 1.1664	Depositor

## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: ADP, BEF, MG

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	C	0.16	0/1592	0.33	0/2164
1	D	0.13	0/1592	0.32	0/2164
1	H	0.16	0/1592	0.34	0/2164
1	I	0.13	0/1592	0.30	0/2164
2	E	0.15	0/4110	0.35	0/5560
2	j	0.15	0/4110	0.36	0/5560
3	A	0.12	0/6059	0.30	0/8179
3	B	0.11	0/6059	0.28	0/8179
3	F	0.12	0/6059	0.30	0/8179
3	G	0.11	0/6059	0.29	0/8179
4	P	0.19	0/1376	0.47	0/2122
4	Q	0.19	0/1376	0.47	0/2122
All	All	0.13	0/41576	0.32	0/56736

There are no bond length outliers.

There are no bond angle outliers.

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	C	1566	1607	1605	19	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	D	1566	1606	1605	16	0
1	H	1566	1607	1605	13	0
1	I	1566	1606	1605	8	0
2	E	4044	4008	4007	44	0
2	j	4044	4008	4007	46	0
3	A	5963	5919	5916	49	0
3	B	5963	5918	5916	46	0
3	F	5963	5919	5915	58	0
3	G	5963	5918	5916	48	0
4	P	1227	692	692	11	0
4	Q	1227	692	692	19	0
5	A	27	12	11	0	0
5	B	27	12	11	1	0
5	F	27	12	11	0	0
5	G	27	12	11	1	0
6	A	2	0	0	0	0
6	F	2	0	0	0	0
7	A	4	0	0	0	0
7	B	4	0	0	0	0
7	F	4	0	0	0	0
7	G	4	0	0	0	0
All	All	40786	39548	39525	330	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 4.

All (330) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:120:VAL:HG12	2:E:361:VAL:HG21	1.52	0.91
2:j:404:ALA:HB1	3:F:1055:MET:SD	2.16	0.86
3:F:80:LEU:HD23	3:F:139:MET:HE1	1.62	0.81
3:A:80:LEU:HD23	3:A:139:MET:HE1	1.63	0.80
1:H:120:VAL:HG12	2:j:361:VAL:HG21	1.63	0.79
3:A:226:LEU:HD13	3:A:870:ILE:HD11	1.67	0.76
3:A:808:ASP:OD1	3:A:812:LEU:HD13	1.87	0.74
2:E:443:LEU:HD21	3:B:1055:MET:HE2	1.69	0.73
3:G:1055:MET:O	3:G:1055:MET:HE3	1.90	0.71
3:A:214:LEU:HD23	3:A:214:LEU:O	1.89	0.71
3:F:226:LEU:HD21	3:F:874:LEU:HD21	1.73	0.71
3:F:214:LEU:HD23	3:F:214:LEU:O	1.93	0.68

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:j:446:PHE:O	2:j:450:ILE:HD12	1.93	0.68
3:A:172:GLU:HA	3:A:178:LEU:HD22	1.76	0.68
3:F:172:GLU:HA	3:F:178:LEU:HD22	1.75	0.67
3:F:699:LEU:HD13	3:G:337:MET:HE2	1.78	0.66
3:F:699:LEU:HD22	3:G:337:MET:HE1	1.78	0.65
2:j:450:ILE:HD11	3:G:1080:LEU:HD21	1.77	0.65
2:E:194:SER:OG	2:j:123:THR:HG21	1.98	0.64
3:G:856:VAL:HG11	3:G:934:LEU:HD21	1.80	0.64
1:C:120:VAL:HG12	2:E:361:VAL:CG2	2.26	0.64
3:B:60:LEU:HD12	3:B:202:PHE:CD1	2.32	0.64
3:G:60:LEU:HD12	3:G:202:PHE:CD1	2.33	0.64
2:E:443:LEU:CD2	3:B:1055:MET:HE2	2.29	0.63
3:B:856:VAL:HG11	3:B:934:LEU:HD21	1.79	0.62
1:I:213:LEU:HD13	2:j:374:PHE:CZ	2.35	0.62
3:B:128:TRP:CG	3:B:160:TYR:HH	2.18	0.61
1:D:213:LEU:HD13	2:E:374:PHE:CZ	2.35	0.61
1:D:59:GLY:C	1:D:60:LEU:HD12	2.26	0.61
3:A:301:TRP:CD2	3:A:765:LEU:HD21	2.35	0.61
3:F:333:VAL:HG13	3:F:699:LEU:CD1	2.31	0.61
3:F:300:LEU:HB3	3:F:765:LEU:HD22	1.83	0.60
3:G:128:TRP:CG	3:G:160:TYR:HH	2.19	0.60
2:j:261:LYS:HE2	2:j:261:LYS:HA	1.83	0.59
3:F:301:TRP:CD2	3:F:765:LEU:HD21	2.37	0.59
3:A:226:LEU:CD1	3:A:870:ILE:HD11	2.33	0.58
2:j:404:ALA:HB1	3:F:1055:MET:CE	2.33	0.58
2:j:443:LEU:CD2	3:G:1055:MET:HE2	2.33	0.58
4:Q:45:DA:H2'	4:Q:46:DT:H71	1.84	0.58
1:I:213:LEU:HD13	2:j:374:PHE:HZ	1.69	0.58
3:F:333:VAL:HG13	3:F:699:LEU:HD12	1.86	0.57
3:B:34:ILE:HG23	3:B:39:THR:HG21	1.87	0.57
1:D:213:LEU:HD13	2:E:374:PHE:HZ	1.68	0.57
1:H:215:ASP:OD1	1:H:215:ASP:C	2.47	0.57
1:C:215:ASP:OD1	1:C:215:ASP:C	2.48	0.56
3:F:699:LEU:HD22	3:G:337:MET:CE	2.35	0.56
3:A:337:MET:HE1	3:B:699:LEU:HD23	1.87	0.56
3:A:300:LEU:HB3	3:A:765:LEU:HD22	1.87	0.55
1:H:120:VAL:HG12	2:j:361:VAL:CG2	2.35	0.55
1:C:117:HIS:O	1:C:120:VAL:HG22	2.05	0.55
3:B:50:THR:HG22	5:B:1101:ADP:O2A	2.07	0.55
2:j:430:LEU:HD13	2:j:482:LEU:HD12	1.89	0.55
3:G:211:LEU:HD11	3:G:213:GLN:O	2.08	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:696:LYS:HA	3:B:337:MET:HE1	1.89	0.54
3:G:126:LEU:HD23	3:G:144:LEU:HD11	1.89	0.54
3:B:125:ALA:C	3:B:126:LEU:HD22	2.33	0.53
2:E:450:ILE:HG21	3:B:1067:VAL:HG11	1.90	0.53
3:B:900:VAL:O	3:B:900:VAL:HG23	2.08	0.53
1:D:151:ALA:HA	3:B:900:VAL:HG21	1.91	0.53
3:A:811:ALA:C	3:A:812:LEU:HD12	2.34	0.53
3:G:60:LEU:HD12	3:G:202:PHE:CE1	2.44	0.53
3:B:60:LEU:HD12	3:B:202:PHE:CE1	2.43	0.52
2:j:413:LEU:HD23	2:j:413:LEU:C	2.34	0.52
2:j:443:LEU:HD23	3:G:1055:MET:HE2	1.91	0.52
2:E:421:LEU:CD1	2:E:492:LEU:HD12	2.40	0.52
3:A:819:LEU:HD12	3:A:819:LEU:H	1.74	0.52
3:A:859:LEU:O	3:A:863:ILE:HG13	2.09	0.52
4:Q:58:DT:H2'	4:Q:58:DT:O2	2.10	0.52
3:G:126:LEU:HD23	3:G:144:LEU:CD1	2.40	0.52
1:H:45:LEU:HD22	1:H:45:LEU:H	1.74	0.52
2:j:17:ASN:O	2:j:23:ILE:HD11	2.10	0.52
3:B:126:LEU:HD23	3:B:144:LEU:HD11	1.92	0.51
3:G:1014:LEU:O	3:G:1014:LEU:HD12	2.10	0.51
3:B:262:LEU:HD11	3:B:812:LEU:HD11	1.91	0.51
3:B:211:LEU:HD11	3:B:213:GLN:O	2.10	0.51
3:F:217:ILE:HD11	3:F:221:PHE:CE1	2.46	0.51
3:G:900:VAL:O	3:G:900:VAL:HG23	2.10	0.51
3:G:125:ALA:C	3:G:126:LEU:HD22	2.35	0.51
3:A:808:ASP:OD1	3:A:812:LEU:HD22	2.10	0.51
1:D:45:LEU:HD23	1:D:47:LYS:N	2.27	0.51
3:A:333:VAL:HG13	3:A:699:LEU:HD12	1.93	0.51
3:A:178:LEU:HD23	3:A:178:LEU:C	2.35	0.50
3:A:300:LEU:CB	3:A:765:LEU:HD22	2.41	0.50
3:A:867:VAL:HA	3:A:870:ILE:HG22	1.93	0.50
1:I:51:ALA:HA	1:I:69:LEU:HD22	1.92	0.50
3:B:1055:MET:HA	3:B:1055:MET:HE3	1.92	0.50
3:F:859:LEU:O	3:F:863:ILE:HG12	2.10	0.50
3:G:1018:ILE:HD12	3:G:1019:ILE:H	1.77	0.50
3:B:1014:LEU:HD12	3:B:1014:LEU:O	2.12	0.50
1:H:138:GLN:O	1:H:141:VAL:HG22	2.12	0.50
1:C:95:GLU:CD	3:A:809:THR:HG21	2.36	0.50
1:I:45:LEU:HD22	1:I:45:LEU:H	1.77	0.50
3:B:822:ILE:N	3:B:823:PRO:HD2	2.27	0.50
3:F:178:LEU:HD23	3:F:178:LEU:C	2.37	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:j:385:LEU:HD22	3:F:161:HIS:HE1	1.78	0.49
3:G:822:ILE:N	3:G:823:PRO:HD2	2.27	0.49
3:A:955:ASP:C	3:A:955:ASP:OD1	2.55	0.49
1:I:151:ALA:HA	3:G:900:VAL:HG21	1.94	0.49
1:D:68:ASN:O	1:D:72:ILE:HG12	2.12	0.49
1:C:129:GLN:O	1:C:133:VAL:HG23	2.13	0.49
3:A:226:LEU:HD13	3:A:870:ILE:CD1	2.41	0.49
1:C:45:LEU:HD13	3:A:943:GLU:HG3	1.94	0.49
2:E:449:TRP:O	2:E:452:MET:HG3	2.12	0.49
3:A:269:TRP:CE3	3:A:822:ILE:HD13	2.48	0.49
2:j:421:LEU:CD1	2:j:492:LEU:HD12	2.43	0.49
4:Q:2:DT:O2	4:Q:2:DT:C2'	2.60	0.48
2:E:227:ILE:HG21	2:E:321:LEU:HD21	1.95	0.48
2:j:385:LEU:HD13	3:F:161:HIS:ND1	2.28	0.48
2:E:38:LYS:O	2:E:42:GLU:HB2	2.14	0.48
1:D:85:GLU:OE1	1:D:86:PRO:N	2.47	0.48
3:B:301:TRP:CD2	3:B:765:LEU:HD21	2.48	0.48
2:E:34:LEU:HD13	2:E:114:VAL:HG11	1.96	0.48
3:B:127:LEU:HD22	3:B:139:MET:SD	2.54	0.48
4:Q:37:DA:C8	4:Q:38:DT:H72	2.49	0.48
3:A:121:VAL:O	3:A:121:VAL:HG13	2.14	0.48
2:E:141:THR:HG23	2:E:153:THR:HG21	1.96	0.48
3:G:139:MET:SD	3:G:139:MET:C	2.96	0.48
2:E:346:ARG:HB2	2:E:349:ILE:HD12	1.95	0.48
3:B:887:GLN:HB3	3:B:888:PRO:HD2	1.94	0.48
2:E:448:VAL:O	2:E:452:MET:HG2	2.14	0.48
2:E:408:LEU:HD11	2:E:413:LEU:CD2	2.44	0.47
3:A:50:THR:HG22	3:A:1021:ASP:OD2	2.14	0.47
3:B:785:ARG:HE	3:B:786:VAL:HG13	1.79	0.47
3:F:121:VAL:HG13	3:F:121:VAL:O	2.14	0.47
3:G:301:TRP:CD2	3:G:765:LEU:HD21	2.49	0.47
4:P:27:DA:H2'	4:P:28:DT:H71	1.96	0.47
4:Q:45:DA:C2'	4:Q:46:DT:H71	2.44	0.47
2:j:24:LEU:HD22	2:j:93:LEU:HD21	1.95	0.47
1:H:125:LEU:HD23	2:j:356:LEU:HD12	1.96	0.47
1:C:167:ILE:HD11	2:E:214:ARG:HD2	1.95	0.47
3:A:79:ASP:N	3:A:79:ASP:OD2	2.47	0.47
3:A:220:ILE:HD13	3:A:997:LEU:HD21	1.97	0.47
3:F:867:VAL:CG1	3:F:960:LEU:HD21	2.45	0.47
3:G:168:LEU:HA	3:G:171:MET:SD	2.54	0.47
1:C:131:LEU:C	1:C:131:LEU:HD23	2.39	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:F:286:GLU:HB3	3:F:779:ILE:HG21	1.97	0.47
3:F:955:ASP:OD1	3:F:955:ASP:C	2.58	0.47
3:G:708:GLU:O	3:G:712:GLN:HG2	2.14	0.47
3:G:1001:LEU:HD23	3:G:1005:LEU:HD23	1.96	0.47
1:C:95:GLU:OE2	3:A:809:THR:HG21	2.15	0.47
2:E:348:MET:HE2	2:E:348:MET:HA	1.96	0.47
3:F:1019:ILE:HG22	3:F:1020:LEU:N	2.29	0.47
3:A:53:VAL:HG12	3:A:57:MET:HE3	1.97	0.46
3:B:1068:VAL:HG13	3:B:1076:ASN:O	2.15	0.46
3:F:79:ASP:OD2	3:F:79:ASP:N	2.47	0.46
3:A:867:VAL:O	3:A:870:ILE:HG22	2.15	0.46
3:B:808:ASP:CB	3:B:812:LEU:HD12	2.46	0.46
3:F:867:VAL:HG13	3:F:960:LEU:HD21	1.97	0.46
2:E:134:ARG:HB3	2:j:134:ARG:HH12	1.80	0.46
2:E:241:THR:N	2:E:242:PRO:HD2	2.31	0.46
4:Q:2:DT:O2	4:Q:2:DT:H2'	2.15	0.46
1:C:138:GLN:O	1:C:141:VAL:HG22	2.15	0.46
3:F:1001:LEU:HD11	3:F:1005:LEU:HD11	1.98	0.46
3:G:785:ARG:HE	3:G:786:VAL:HG13	1.80	0.46
3:G:339:ARG:O	3:G:343:VAL:HG22	2.15	0.46
2:E:419:GLN:OE1	2:E:419:GLN:HA	2.16	0.46
2:E:227:ILE:CG2	2:E:321:LEU:HD21	2.46	0.46
2:E:241:THR:HG23	2:E:245:ARG:HD2	1.98	0.46
2:E:267:LEU:HD13	2:E:288:LEU:O	2.15	0.46
2:j:419:GLN:OE1	2:j:419:GLN:HA	2.16	0.46
3:F:300:LEU:CB	3:F:765:LEU:HD22	2.45	0.46
3:A:18:ILE:CD1	3:A:52:LEU:HD11	2.46	0.46
3:B:1018:ILE:HD12	3:B:1019:ILE:H	1.80	0.46
3:B:282:TRP:CD1	3:B:786:VAL:HG11	2.51	0.46
1:H:120:VAL:O	1:H:120:VAL:HG23	2.15	0.46
1:H:137:ARG:HG3	2:j:332:LEU:HD11	1.98	0.46
2:E:267:LEU:HD21	2:E:288:LEU:HD11	1.98	0.45
3:A:1062:THR:C	3:A:1063:ARG:HE	2.24	0.45
4:P:11:DA:C2	4:Q:51:DA:C2	3.04	0.45
2:E:385:LEU:HD22	2:E:385:LEU:H	1.80	0.45
3:A:804:ALA:O	3:A:808:ASP:HB2	2.16	0.45
3:F:795:ILE:O	3:F:798:THR:HG22	2.16	0.45
3:F:18:ILE:CD1	3:F:52:LEU:HD11	2.45	0.45
3:F:80:LEU:HD23	3:F:139:MET:CE	2.40	0.45
3:G:887:GLN:HB3	3:G:888:PRO:HD2	1.98	0.45
3:F:291:LEU:HD21	3:F:745:MET:HG3	1.99	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:137:ARG:HG3	2:E:332:LEU:HD11	1.97	0.45
2:j:413:LEU:HD21	2:j:449:TRP:CD1	2.52	0.45
3:G:50:THR:HG22	5:G:1101:ADP:O2A	2.15	0.45
3:A:1001:LEU:HD11	3:A:1005:LEU:HD11	1.98	0.45
3:G:262:LEU:HD11	3:G:812:LEU:HD11	1.98	0.45
1:I:109:THR:HG23	1:I:109:THR:O	2.17	0.45
2:j:361:VAL:HG13	2:j:361:VAL:O	2.17	0.45
2:E:414:ILE:HD13	2:E:452:MET:CE	2.47	0.44
4:Q:15:DA:H2'	4:Q:16:DT:H71	1.99	0.44
4:Q:43:DA:H2'	4:Q:44:DT:H71	1.99	0.44
1:D:45:LEU:HD23	1:D:47:LYS:H	1.82	0.44
3:B:40:ALA:HB1	3:B:1058:LEU:HD13	1.98	0.44
2:j:38:LYS:O	2:j:42:GLU:HB2	2.17	0.44
3:G:214:LEU:HD13	3:G:993:ALA:HA	1.99	0.44
2:j:241:THR:N	2:j:242:PRO:HD2	2.31	0.44
2:E:153:THR:O	2:E:156:ARG:HG2	2.17	0.44
2:j:150:ARG:O	2:j:154:LEU:HD12	2.17	0.44
1:C:43:ARG:HA	1:D:85:GLU:OE2	2.17	0.44
3:A:1018:ILE:HG21	3:A:1039:LEU:HD11	1.99	0.44
4:Q:46:DT:C2	4:Q:47:DA:N7	2.86	0.44
2:E:139:LEU:HD13	2:j:184:HIS:HB3	1.99	0.44
3:A:80:LEU:HD23	3:A:139:MET:CE	2.42	0.44
3:F:38:GLY:C	3:F:1062:THR:HG22	2.42	0.44
3:G:168:LEU:O	3:G:171:MET:SD	2.76	0.44
3:B:126:LEU:HD23	3:B:144:LEU:CD1	2.48	0.44
3:B:893:ARG:NH1	3:B:967:MET:HE1	2.33	0.44
2:j:153:THR:O	2:j:156:ARG:HG2	2.17	0.44
3:G:893:ARG:NH1	3:G:967:MET:HE1	2.31	0.44
3:B:877:LEU:HD23	3:B:877:LEU:O	2.17	0.44
2:j:34:LEU:HD13	2:j:114:VAL:HG11	1.98	0.43
2:E:435:GLU:OE2	2:E:435:GLU:HA	2.18	0.43
3:B:976:GLU:OE2	3:B:976:GLU:HA	2.18	0.43
4:P:1:DA:H2''	4:P:2:DT:O2	2.18	0.43
3:B:1011:ARG:HA	3:B:1011:ARG:NE	2.32	0.43
2:E:227:ILE:HG23	2:E:317:MET:HG2	2.00	0.43
3:F:810:GLY:O	3:F:813:VAL:HG22	2.17	0.43
1:D:51:ALA:HA	1:D:69:LEU:HD22	1.99	0.43
2:j:141:THR:O	2:j:141:THR:HG22	2.18	0.43
3:F:300:LEU:HB2	3:F:765:LEU:HD13	1.99	0.43
3:F:822:ILE:N	3:F:823:PRO:CD	2.82	0.43
3:B:68:LEU:HD11	3:B:73:GLY:HA2	2.01	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:19:HIS:ND1	2:j:117:LEU:HD22	2.34	0.43
3:A:822:ILE:N	3:A:823:PRO:CD	2.81	0.43
1:C:104:VAL:HG12	1:C:105:ARG:N	2.34	0.43
1:D:132:LEU:HD23	1:D:132:LEU:O	2.18	0.43
2:j:385:LEU:HD22	3:F:161:HIS:CE1	2.52	0.43
3:F:71:THR:HG22	3:F:71:THR:O	2.19	0.43
4:Q:25:DA:H2'	4:Q:26:DT:H71	1.99	0.43
2:j:267:LEU:HD13	2:j:288:LEU:O	2.18	0.43
3:F:80:LEU:CD2	3:F:139:MET:HE1	2.43	0.43
4:Q:4:DT:H2''	4:Q:5:DA:C8	2.53	0.43
1:D:159:ASP:HA	1:D:162:LEU:HD12	2.01	0.42
3:A:77:ASP:OD2	3:A:77:ASP:N	2.52	0.42
3:B:997:LEU:HD23	3:B:997:LEU:HA	1.95	0.42
3:F:333:VAL:HG13	3:F:699:LEU:HD11	2.02	0.42
2:E:42:GLU:OE2	2:E:283:LEU:HD13	2.19	0.42
3:A:300:LEU:HB2	3:A:765:LEU:HD13	2.01	0.42
1:I:85:GLU:HG3	1:I:86:PRO:HD3	2.01	0.42
3:G:4:VAL:O	3:G:4:VAL:HG12	2.19	0.42
3:G:877:LEU:HD23	3:G:877:LEU:O	2.19	0.42
2:E:224:ARG:HD3	2:E:321:LEU:HD22	2.01	0.42
3:A:107:VAL:HG22	3:A:108:THR:N	2.35	0.42
3:F:21:PHE:O	3:F:108:THR:HG23	2.19	0.42
4:P:5:DA:C2	4:Q:57:DA:C2	3.08	0.42
3:A:333:VAL:HG13	3:A:699:LEU:CD1	2.49	0.42
2:j:62:ILE:HA	2:j:65:VAL:HG13	2.01	0.42
1:C:42:THR:HG23	1:C:42:THR:O	2.20	0.42
1:D:60:LEU:HD12	1:D:60:LEU:N	2.34	0.42
3:A:987:GLY:HA3	3:B:45:THR:HG23	2.02	0.42
3:B:113:THR:C	3:B:114:LEU:HD12	2.45	0.42
1:H:51:ALA:HB1	1:H:73:VAL:HG23	2.01	0.42
3:F:1036:ILE:HG21	3:F:1061:HIS:CD2	2.54	0.42
1:I:68:ASN:O	1:I:72:ILE:HG12	2.20	0.42
2:j:227:ILE:HG21	2:j:321:LEU:CD1	2.50	0.42
3:F:301:TRP:CG	3:F:765:LEU:HD21	2.54	0.42
3:F:782:GLU:O	3:F:786:VAL:HG23	2.20	0.42
3:F:1039:LEU:HD21	3:F:1046:ALA:CB	2.49	0.42
4:P:11:DA:C8	4:P:12:DT:H72	2.54	0.42
4:P:53:DA:H2'	4:P:54:DT:H72	2.02	0.42
1:D:66:LYS:HG2	1:D:69:LEU:HD12	2.00	0.42
3:F:161:HIS:CD2	3:F:161:HIS:C	2.97	0.42
3:F:951:LYS:O	3:F:955:ASP:HB3	2.20	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:167:ILE:HD11	2:E:214:ARG:HB3	2.01	0.42
1:D:104:VAL:CG1	1:D:106:LEU:HD23	2.50	0.42
3:B:887:GLN:O	3:B:888:PRO:C	2.61	0.42
2:j:479:ARG:HB2	3:G:1085:LEU:HD21	2.01	0.42
4:P:33:DA:H2'	4:P:34:DT:H72	2.02	0.42
4:Q:35:DA:H2'	4:Q:36:DT:H71	2.02	0.42
1:D:45:LEU:HD23	1:D:46:GLN:N	2.34	0.42
2:E:327:ARG:HE	2:E:331:LEU:HD11	1.85	0.42
2:j:261:LYS:HE2	2:j:261:LYS:CA	2.48	0.42
3:F:1052:ASN:O	3:F:1055:MET:HE1	2.20	0.42
4:Q:53:DA:H2'	4:Q:54:DT:H71	2.01	0.42
2:E:163:ARG:NE	2:E:163:ARG:HA	2.35	0.41
1:H:95:GLU:HG3	3:F:809:THR:HG21	2.02	0.41
2:j:397:ILE:HG22	2:j:398:GLY:N	2.35	0.41
3:G:808:ASP:CB	3:G:812:LEU:HD12	2.50	0.41
3:B:4:VAL:O	3:B:4:VAL:HG12	2.19	0.41
3:F:891:TYR:O	3:F:892:LEU:HD12	2.20	0.41
3:G:204:LEU:CD1	3:G:225:VAL:HG22	2.50	0.41
3:G:807:VAL:HG12	3:G:807:VAL:O	2.20	0.41
2:j:414:ILE:HD13	2:j:452:MET:HE2	2.01	0.41
3:G:887:GLN:O	3:G:888:PRO:C	2.63	0.41
2:E:23:ILE:O	2:E:27:THR:HG23	2.20	0.41
2:j:232:LEU:HD12	2:j:232:LEU:C	2.46	0.41
3:F:107:VAL:HG22	3:F:108:THR:N	2.35	0.41
3:F:282:TRP:N	3:F:282:TRP:CD1	2.89	0.41
3:A:1048:PHE:O	3:A:1049:ILE:HD13	2.21	0.41
2:j:196:ARG:O	2:j:196:ARG:HG2	2.19	0.41
3:F:162:GLU:OE1	3:F:167:LEU:HD22	2.21	0.41
4:Q:11:DA:H2'	4:Q:12:DT:H71	2.02	0.41
1:C:51:ALA:HB1	1:C:73:VAL:HG23	2.03	0.41
3:G:208:ALA:HA	3:G:997:LEU:HD13	2.03	0.41
4:P:55:DA:C2	4:Q:7:DA:C2	3.08	0.41
3:B:1040:ARG:HA	3:B:1040:ARG:NE	2.36	0.41
1:H:117:HIS:O	1:H:120:VAL:HG22	2.20	0.41
3:G:56:LEU:HD23	3:G:56:LEU:C	2.46	0.41
3:G:232:PHE:CD1	3:G:954:LEU:HD22	2.56	0.41
1:C:45:LEU:H	1:C:45:LEU:HD22	1.86	0.41
2:E:460:VAL:HG13	2:E:485:THR:HB	2.03	0.41
3:A:71:THR:O	3:A:71:THR:HG22	2.20	0.41
3:A:846:ASP:O	3:A:850:ARG:HB2	2.20	0.41
3:B:56:LEU:HD23	3:B:56:LEU:C	2.46	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:B:808:ASP:HB3	3:B:812:LEU:HD12	2.03	0.41
3:B:914:LEU:HD11	3:B:931:LEU:HG	2.02	0.41
1:H:104:VAL:HG12	1:H:105:ARG:N	2.36	0.41
2:j:448:VAL:O	2:j:452:MET:HG3	2.21	0.41
3:F:68:LEU:O	3:F:68:LEU:HD12	2.21	0.41
3:F:228:ASP:OD1	3:F:228:ASP:C	2.63	0.41
3:F:987:GLY:HA3	3:G:45:THR:HG23	2.02	0.41
1:C:126:ASN:OD1	2:E:351:LYS:HA	2.21	0.41
2:E:377:VAL:O	2:E:377:VAL:HG13	2.20	0.41
3:B:40:ALA:CB	3:B:1058:LEU:HD13	2.51	0.41
3:G:127:LEU:HD23	3:G:141:ARG:HA	2.03	0.41
4:P:51:DA:C8	4:P:52:DT:H72	2.56	0.41
1:H:131:LEU:HD23	1:H:131:LEU:C	2.47	0.40
2:j:403:ASP:OD2	2:j:403:ASP:C	2.64	0.40
3:G:206:ASN:C	3:G:206:ASN:HD22	2.28	0.40
3:G:251:GLU:OE2	3:G:840:LYS:HD2	2.22	0.40
2:E:129:LEU:HD12	2:E:129:LEU:O	2.21	0.40
4:P:9:DA:H2'	4:P:10:DT:H72	2.03	0.40
4:Q:23:DA:C8	4:Q:24:DT:H72	2.56	0.40
3:A:1018:ILE:O	3:A:1018:ILE:HG23	2.20	0.40
3:F:1018:ILE:HG21	3:F:1039:LEU:HD11	2.02	0.40
3:A:171:MET:HE3	3:A:178:LEU:HD11	2.03	0.40
3:A:204:LEU:HB2	3:A:224:LEU:O	2.22	0.40
3:B:884:VAL:HG22	3:B:885:ASP:N	2.37	0.40
2:j:241:THR:HG23	2:j:245:ARG:HD2	2.03	0.40
3:F:899:VAL:HG21	3:F:961:GLU:HG3	2.04	0.40
3:G:901:HIS:HB2	3:G:952:ALA:HB1	2.03	0.40
4:Q:3:DA:C8	4:Q:4:DT:H72	2.56	0.40
3:A:951:LYS:O	3:A:955:ASP:HB3	2.21	0.40
3:F:955:ASP:OD1	3:F:957:ARG:HG2	2.21	0.40
4:P:2:DT:O2	4:P:2:DT:H2'	2.22	0.40

There are no symmetry-related clashes.

## 5.3 Torsion angles

### 5.3.1 Protein backbone

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	C	193/250 (77%)	188 (97%)	5 (3%)	0	100	100
1	D	193/250 (77%)	186 (96%)	7 (4%)	0	100	100
1	H	193/250 (77%)	184 (95%)	9 (5%)	0	100	100
1	I	193/250 (77%)	186 (96%)	7 (4%)	0	100	100
2	E	496/503 (99%)	483 (97%)	13 (3%)	0	100	100
2	j	496/503 (99%)	482 (97%)	14 (3%)	0	100	100
3	A	746/1096 (68%)	729 (98%)	17 (2%)	0	100	100
3	B	746/1096 (68%)	733 (98%)	13 (2%)	0	100	100
3	F	746/1096 (68%)	730 (98%)	16 (2%)	0	100	100
3	G	746/1096 (68%)	738 (99%)	8 (1%)	0	100	100
All	All	4748/6390 (74%)	4639 (98%)	109 (2%)	0	100	100

There are no Ramachandran outliers to report.

### 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	C	171/218 (78%)	168 (98%)	3 (2%)	54	71
1	D	171/218 (78%)	171 (100%)	0	100	100
1	H	171/218 (78%)	169 (99%)	2 (1%)	67	79
1	I	171/218 (78%)	171 (100%)	0	100	100
2	E	435/436 (100%)	430 (99%)	5 (1%)	70	80
2	j	435/436 (100%)	433 (100%)	2 (0%)	86	92
3	A	635/929 (68%)	634 (100%)	1 (0%)	92	96
3	B	635/929 (68%)	633 (100%)	2 (0%)	91	94
3	F	635/929 (68%)	633 (100%)	2 (0%)	91	94

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
3	G	635/929 (68%)	633 (100%)	2 (0%)	91	94
All	All	4094/5460 (75%)	4075 (100%)	19 (0%)	85	92

All (19) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	54	GLU
1	C	121	ARG
1	C	145	GLN
2	E	154	LEU
2	E	210	ASP
2	E	216	SER
2	E	295	LEU
2	E	482	LEU
3	A	797	LEU
3	B	42	ILE
3	B	1077	MET
1	H	128	GLU
1	H	230	ILE
2	j	210	ASP
2	j	349	ILE
3	F	821	ASP
3	F	922	ASP
3	G	42	ILE
3	G	1001	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (45) such sidechains are listed below:

Mol	Chain	Res	Type
1	C	139	HIS
1	C	145	GLN
1	D	164	GLN
1	D	192	HIS
2	E	4	ASN
2	E	179	HIS
2	E	190	ASN
2	E	390	HIS
2	E	441	HIS
3	A	31	GLN
3	A	155	HIS
3	A	229	HIS

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Mol	Chain	Res	Type
3	A	258	GLN
3	A	329	GLN
3	A	703	GLN
3	A	756	HIS
3	A	1029	HIS
3	A	1069	HIS
3	B	161	HIS
3	B	249	HIS
3	B	780	GLN
3	B	865	HIS
1	H	145	GLN
1	I	192	HIS
2	j	172	HIS
2	j	190	ASN
2	j	251	GLN
2	j	326	HIS
2	j	390	HIS
3	F	155	HIS
3	F	161	HIS
3	F	183	ASN
3	F	186	GLN
3	F	229	HIS
3	F	249	HIS
3	F	329	GLN
3	F	774	GLN
3	F	865	HIS
3	F	1029	HIS
3	F	1069	HIS
3	F	1076	ASN
3	G	161	HIS
3	G	249	HIS
3	G	263	GLN
3	G	780	GLN

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

## 5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 12 ligands modelled in this entry, 4 are monoatomic - leaving 8 for Mogul analysis.

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
7	BEF	A	1103	-	0,3,3	-	-	-	-	-
5	ADP	B	1101	6	24,29,29	3.12	8 (33%)	29,45,45	2.02	4 (13%)
7	BEF	F	1103	5	0,3,3	-	-	-	-	-
7	BEF	G	1102	3	0,3,3	-	-	-	-	-
5	ADP	G	1101	6	24,29,29	3.12	8 (33%)	29,45,45	2.02	4 (13%)
5	ADP	F	1101	6,7	24,29,29	3.10	8 (33%)	29,45,45	2.12	4 (13%)
5	ADP	A	1101	6	24,29,29	3.10	8 (33%)	29,45,45	2.12	4 (13%)
7	BEF	B	1102	3	0,3,3	-	-	-	-	-

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
5	ADP	B	1101	6	-	2/12/32/32	0/3/3/3
5	ADP	G	1101	6	-	2/12/32/32	0/3/3/3
5	ADP	F	1101	6,7	-	3/12/32/32	0/3/3/3
5	ADP	A	1101	6	-	2/12/32/32	0/3/3/3

All (32) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	B	1101	ADP	C3'-C4'	-8.58	1.31	1.53
5	G	1101	ADP	C3'-C4'	-8.56	1.31	1.53

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	F	1101	ADP	C3'-C4'	-8.54	1.31	1.53
5	A	1101	ADP	C3'-C4'	-8.50	1.31	1.53
5	F	1101	ADP	O4'-C4'	7.68	1.62	1.45
5	B	1101	ADP	O4'-C4'	7.66	1.62	1.45
5	G	1101	ADP	O4'-C4'	7.65	1.62	1.45
5	A	1101	ADP	O4'-C4'	7.58	1.61	1.45
5	B	1101	ADP	O4'-C1'	-7.10	1.31	1.41
5	G	1101	ADP	O4'-C1'	-7.10	1.31	1.41
5	A	1101	ADP	O4'-C1'	-7.04	1.31	1.41
5	F	1101	ADP	O4'-C1'	-6.99	1.31	1.41
5	A	1101	ADP	C6-N6	3.16	1.45	1.34
5	F	1101	ADP	C6-N6	3.15	1.45	1.34
5	B	1101	ADP	C6-N6	3.15	1.45	1.34
5	G	1101	ADP	C6-N6	3.13	1.45	1.34
5	A	1101	ADP	O2'-C2'	-2.99	1.35	1.43
5	B	1101	ADP	O2'-C2'	-2.95	1.36	1.43
5	G	1101	ADP	O2'-C2'	-2.95	1.36	1.43
5	F	1101	ADP	O2'-C2'	-2.94	1.36	1.43
5	B	1101	ADP	O3'-C3'	2.91	1.49	1.43
5	G	1101	ADP	O3'-C3'	2.86	1.49	1.43
5	A	1101	ADP	O3'-C3'	2.82	1.49	1.43
5	F	1101	ADP	O3'-C3'	2.81	1.49	1.43
5	A	1101	ADP	C5-C4	-2.67	1.33	1.40
5	F	1101	ADP	C5-C4	-2.66	1.33	1.40
5	G	1101	ADP	C5-C4	-2.65	1.33	1.40
5	B	1101	ADP	C5-C4	-2.63	1.34	1.40
5	G	1101	ADP	C2-N3	2.11	1.35	1.32
5	B	1101	ADP	C2-N3	2.05	1.35	1.32
5	F	1101	ADP	C2-N3	2.05	1.35	1.32
5	A	1101	ADP	C2-N3	2.05	1.35	1.32

All (16) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	A	1101	ADP	C1'-N9-C4	8.49	141.56	126.64
5	F	1101	ADP	C1'-N9-C4	8.48	141.54	126.64
5	B	1101	ADP	C1'-N9-C4	7.91	140.54	126.64
5	G	1101	ADP	C1'-N9-C4	7.90	140.51	126.64
5	G	1101	ADP	N3-C2-N1	-5.58	119.95	128.68
5	A	1101	ADP	N3-C2-N1	-5.55	120.00	128.68
5	B	1101	ADP	N3-C2-N1	-5.55	120.00	128.68
5	F	1101	ADP	N3-C2-N1	-5.51	120.07	128.68

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	F	1101	ADP	C3'-C2'-C1'	3.09	105.63	100.98
5	A	1101	ADP	C3'-C2'-C1'	3.05	105.57	100.98
5	B	1101	ADP	C3'-C2'-C1'	3.04	105.55	100.98
5	G	1101	ADP	C3'-C2'-C1'	2.98	105.47	100.98
5	F	1101	ADP	PA-O3A-PB	-2.45	124.41	132.83
5	A	1101	ADP	PA-O3A-PB	-2.44	124.44	132.83
5	G	1101	ADP	PA-O3A-PB	-2.14	125.47	132.83
5	B	1101	ADP	PA-O3A-PB	-2.14	125.48	132.83

There are no chirality outliers.

All (9) torsion outliers are listed below:

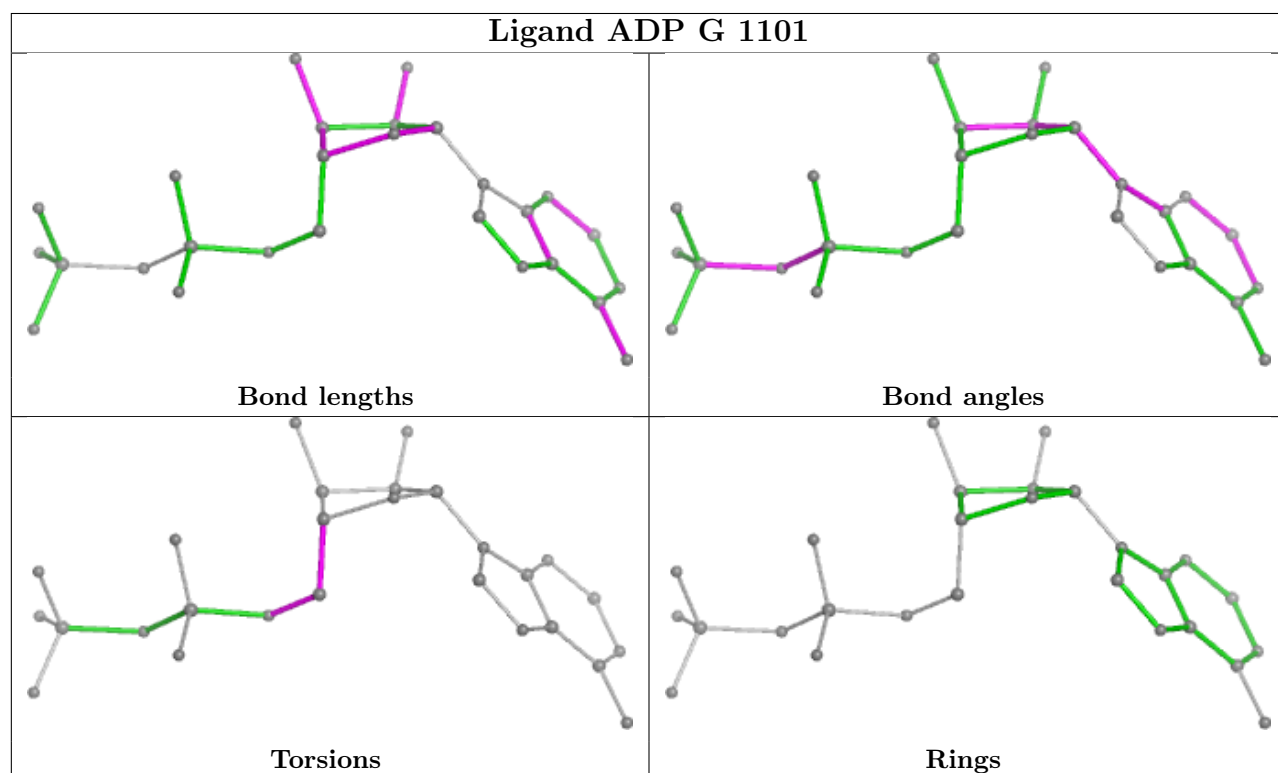
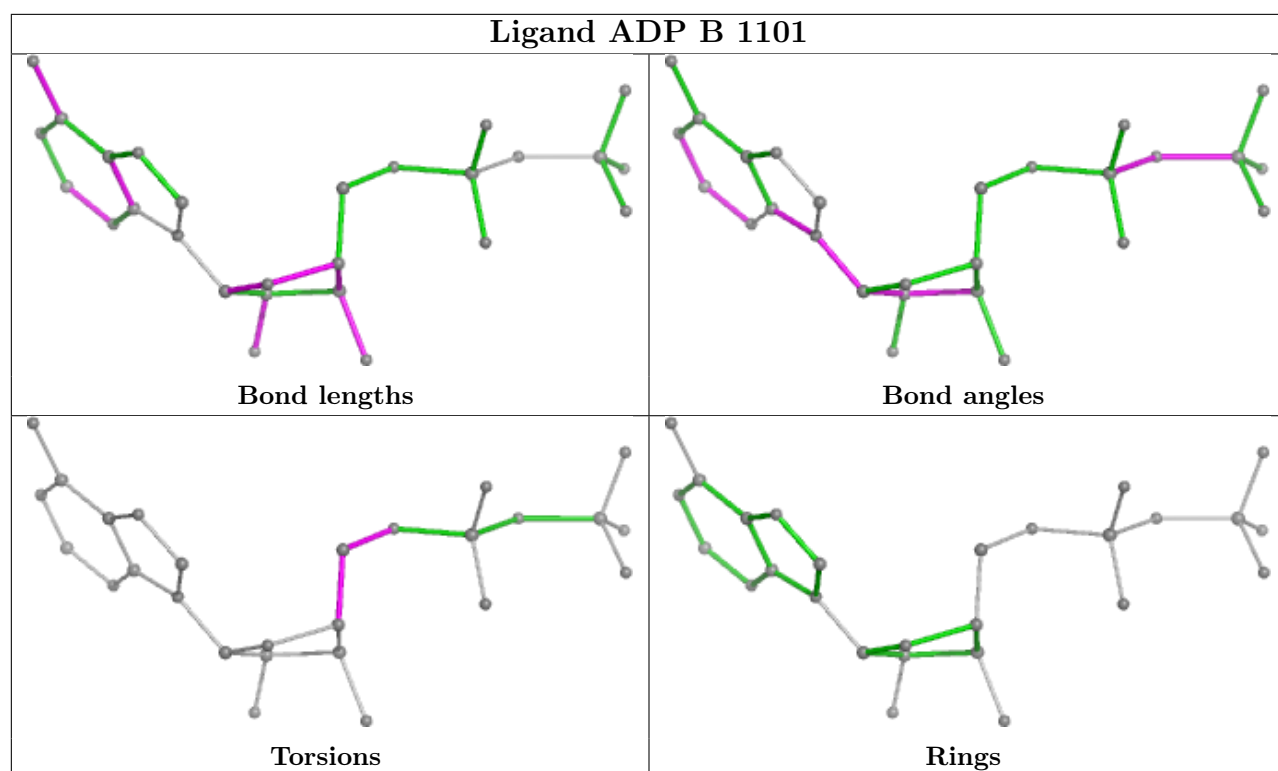
Mol	Chain	Res	Type	Atoms
5	B	1101	ADP	C4'-C5'-O5'-PA
5	G	1101	ADP	C4'-C5'-O5'-PA
5	A	1101	ADP	C4'-C5'-O5'-PA
5	F	1101	ADP	C4'-C5'-O5'-PA
5	A	1101	ADP	O4'-C4'-C5'-O5'
5	B	1101	ADP	O4'-C4'-C5'-O5'
5	F	1101	ADP	O4'-C4'-C5'-O5'
5	G	1101	ADP	O4'-C4'-C5'-O5'
5	F	1101	ADP	C5'-O5'-PA-O1A

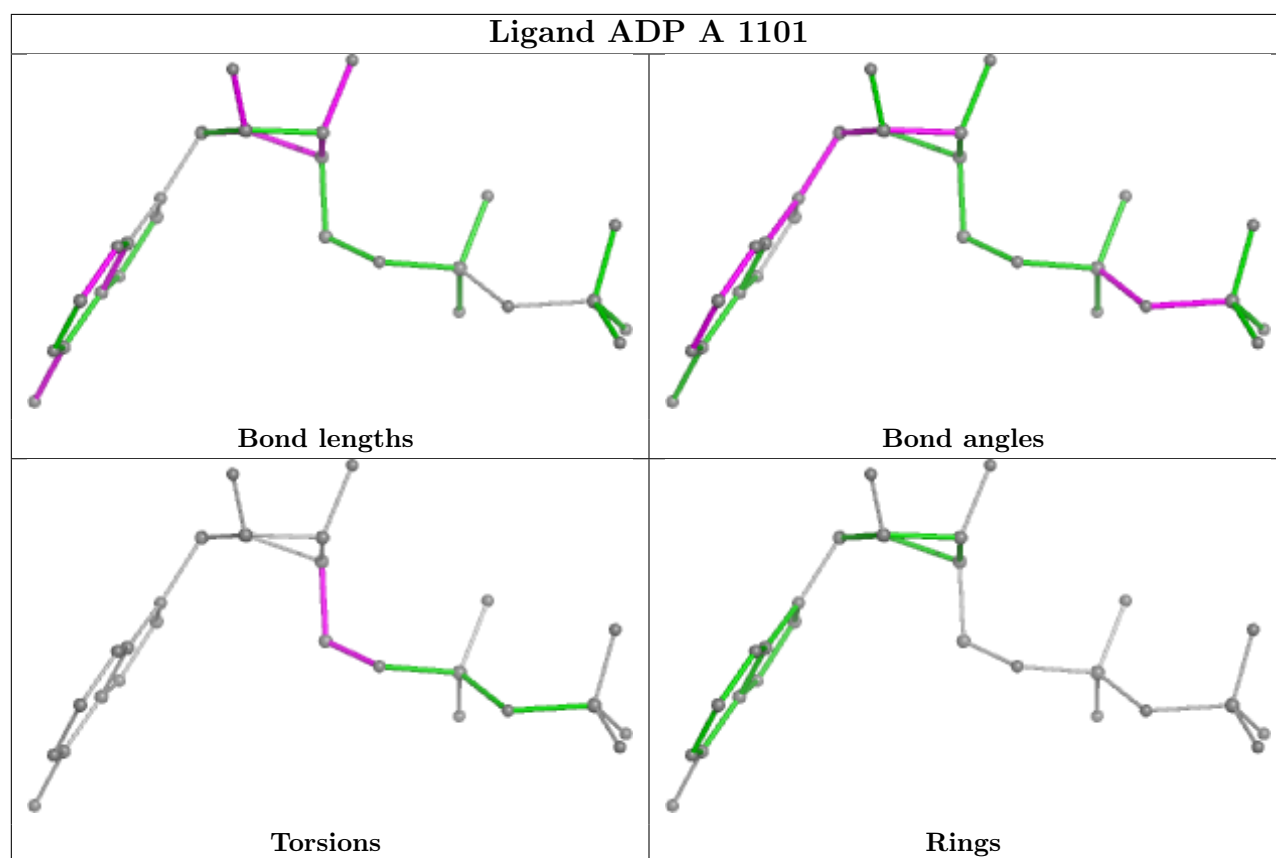
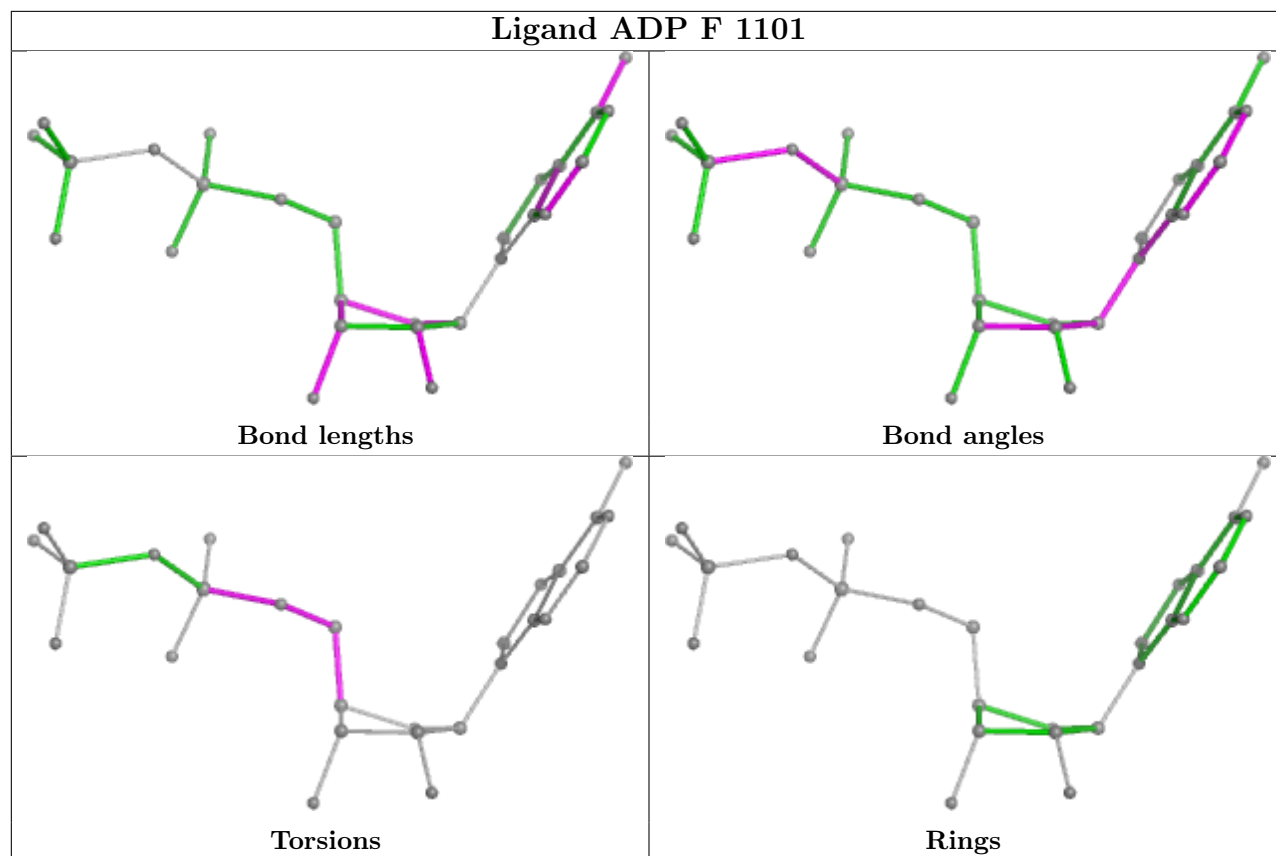
There are no ring outliers.

2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	B	1101	ADP	1	0
5	G	1101	ADP	1	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.





## 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.

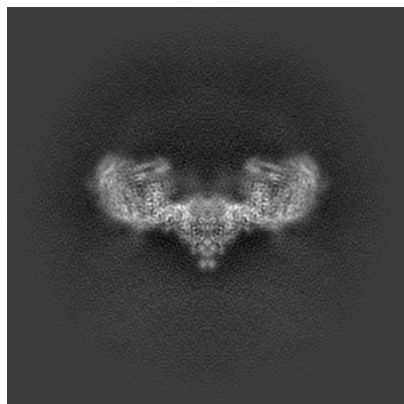
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-53443. These allow visual inspection of the internal detail of the map and identification of artifacts.

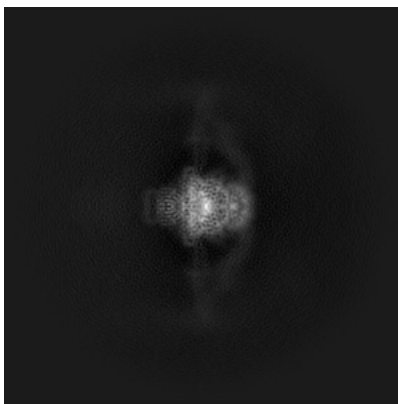
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

### 6.1 Orthogonal projections [i](#)

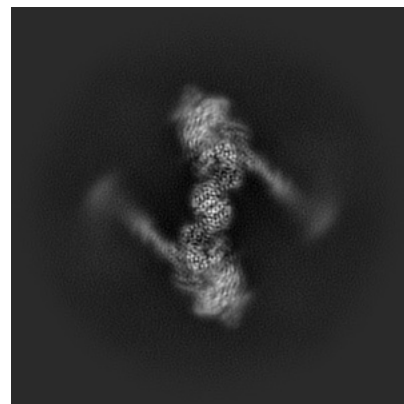
#### 6.1.1 Primary map



X

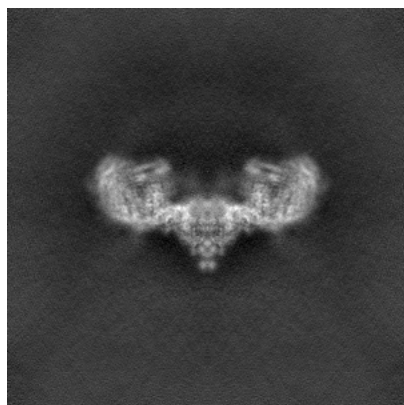


Y

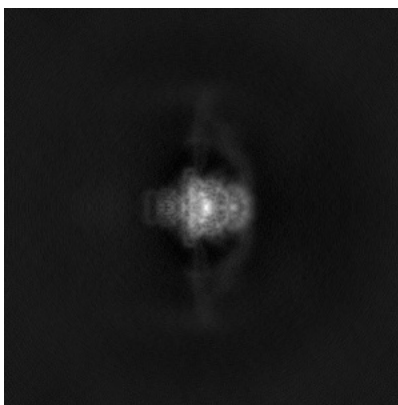


Z

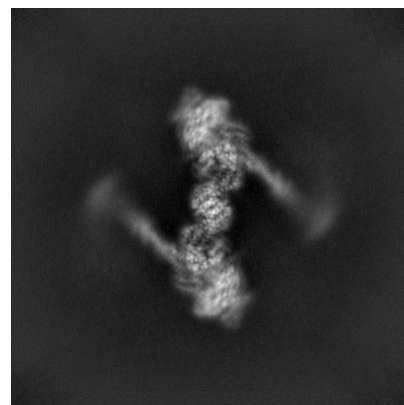
#### 6.1.2 Raw map



X



Y



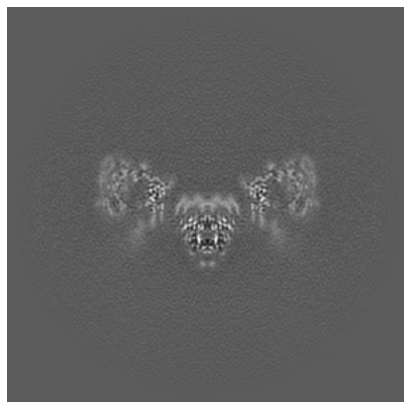
Z

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

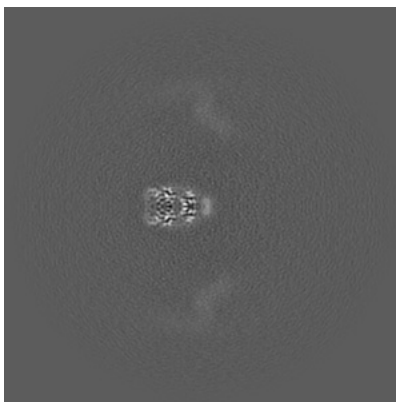


## 6.2 Central slices [i](#)

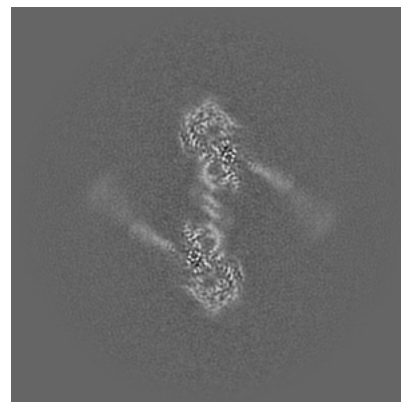
### 6.2.1 Primary map



X Index: 200

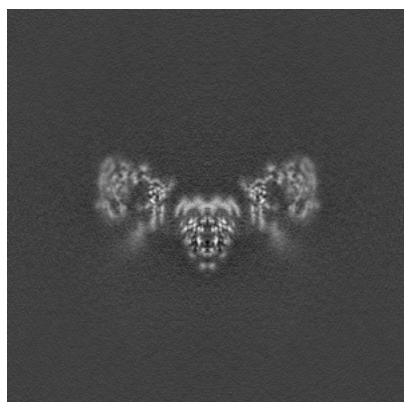


Y Index: 200

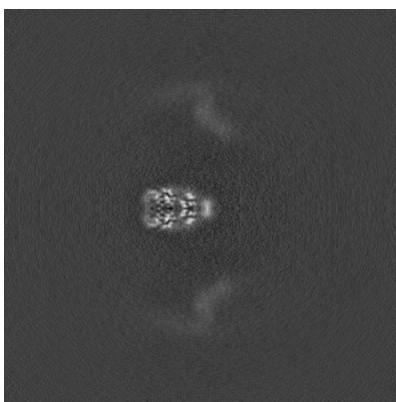


Z Index: 200

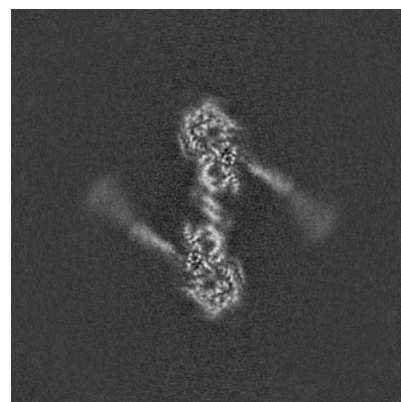
### 6.2.2 Raw map



X Index: 200



Y Index: 200

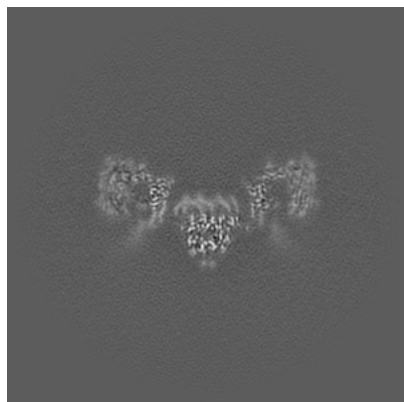


Z Index: 200

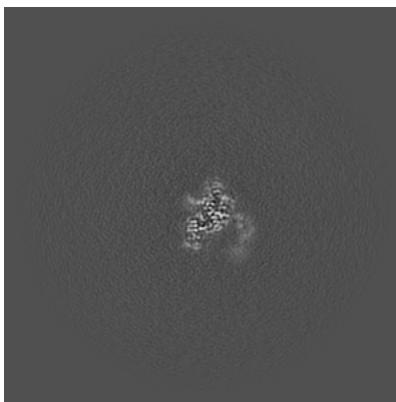
The images above show central slices of the map in three orthogonal directions.

## 6.3 Largest variance slices [i](#)

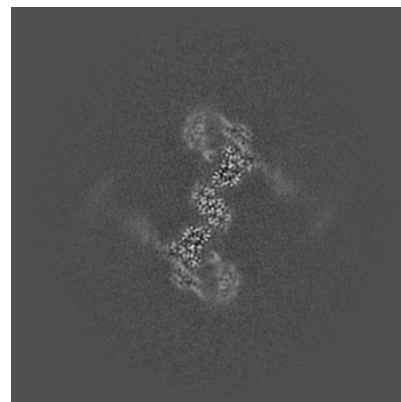
### 6.3.1 Primary map



X Index: 202

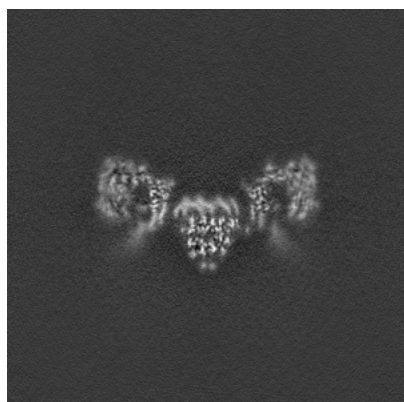


Y Index: 149

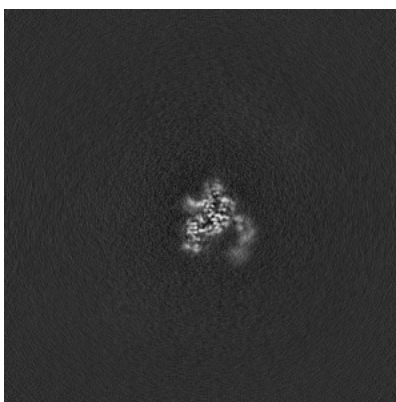


Z Index: 188

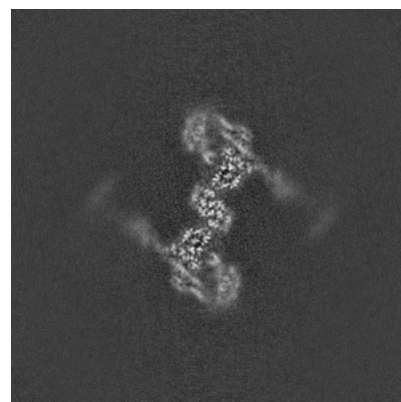
### 6.3.2 Raw map



X Index: 202



Y Index: 149

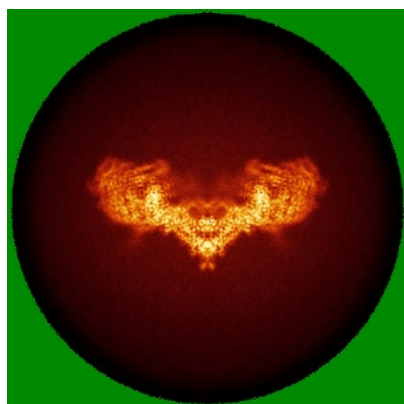


Z Index: 188

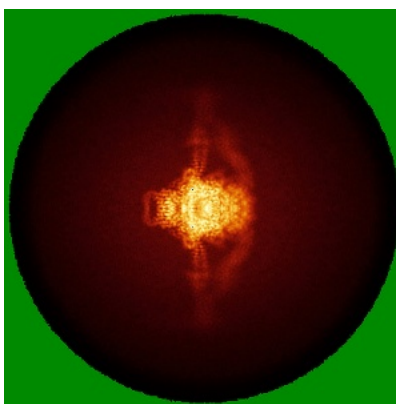
The images above show the largest variance slices of the map in three orthogonal directions.

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

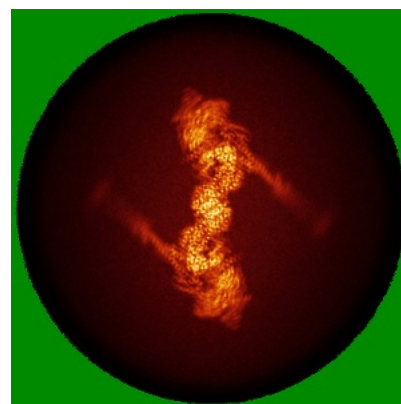
### 6.4.1 Primary map



X



Y

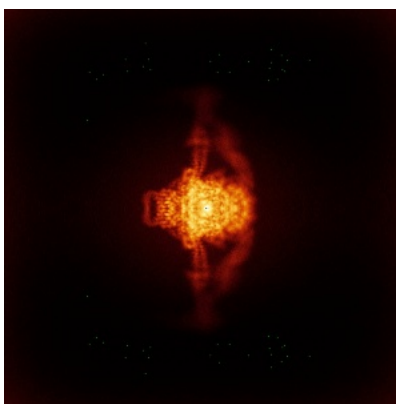


Z

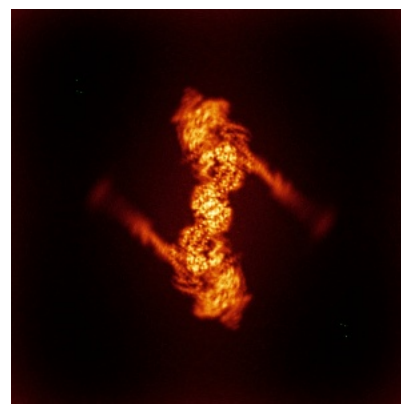
### 6.4.2 Raw map



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.

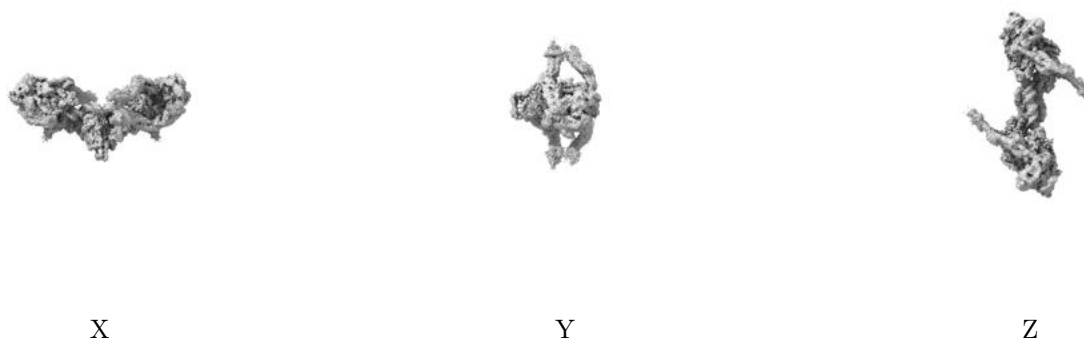
## 6.5 Orthogonal surface views [i](#)

### 6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.31. 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.

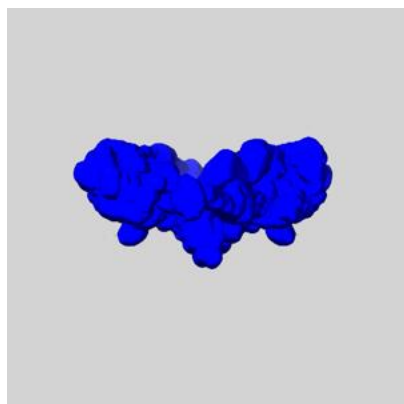
## 6.6 Mask visualisation [i](#)

This section shows the 3D surface view of the primary map at 50% transparency overlaid with the specified mask at 0% transparency

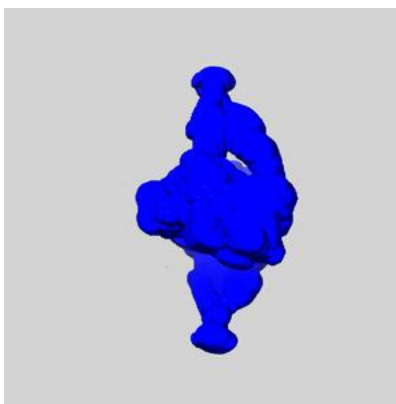
A mask typically either:

- Encompasses the whole structure
- Separates out a domain, a functional unit, a monomer or an area of interest from a larger structure

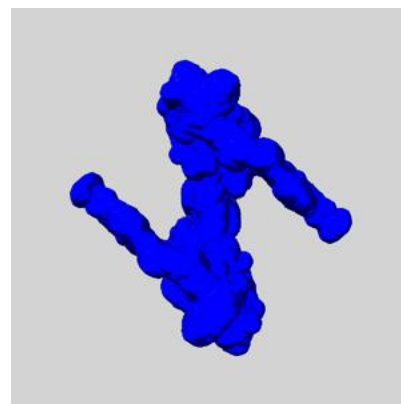
### 6.6.1 emd\_53443\_msk\_1.map [i](#)



X



Y

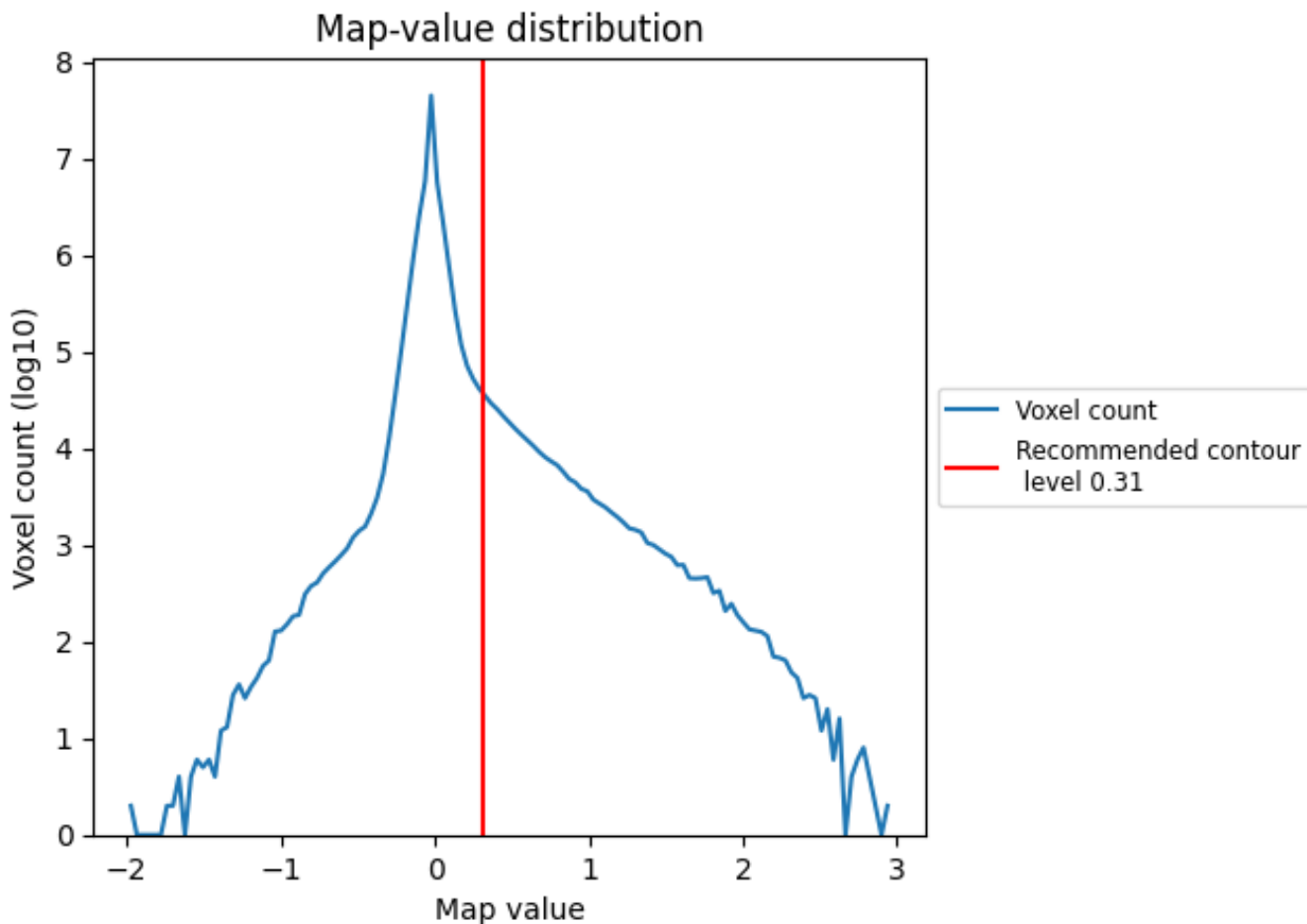


Z

## 7 Map analysis [i](#)

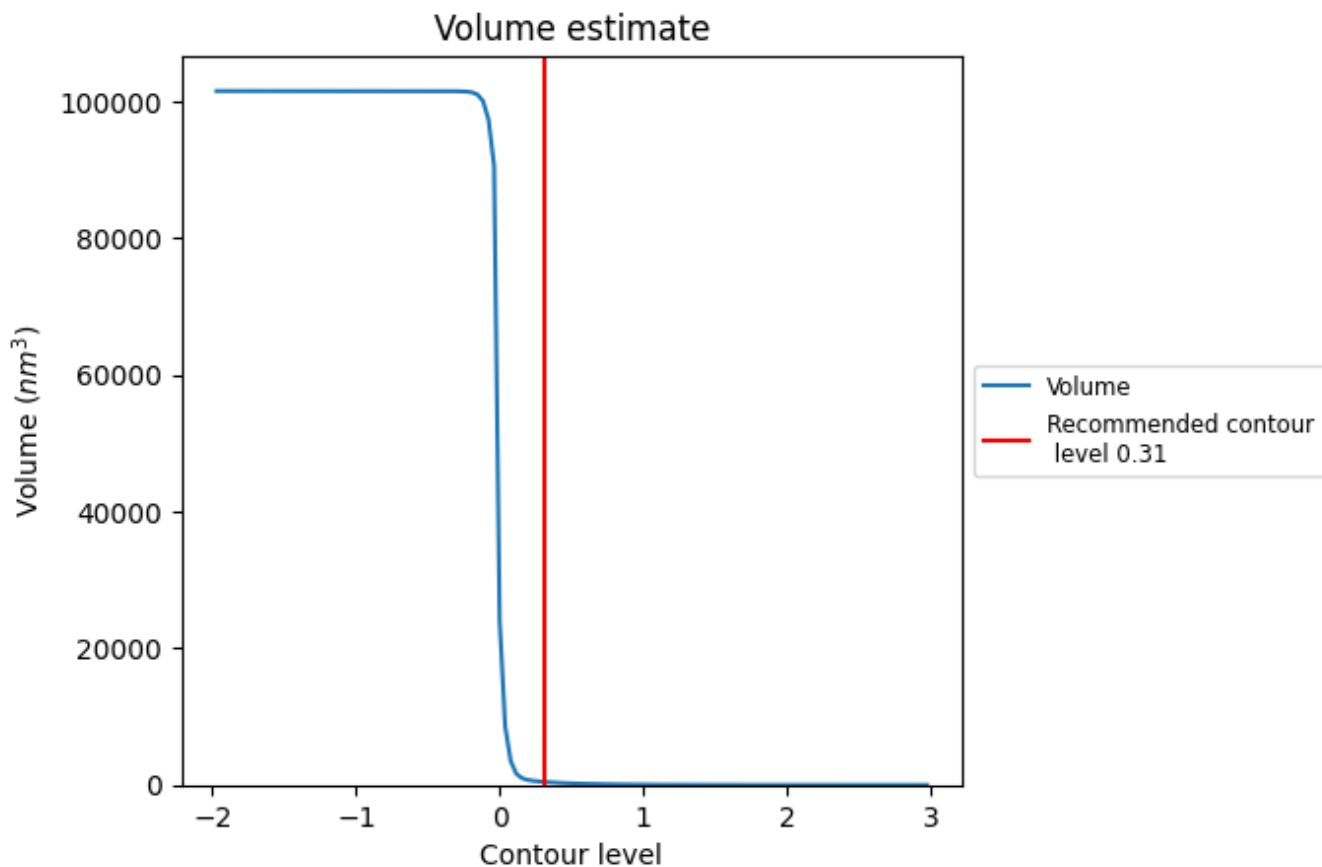
This section contains the results of statistical analysis of the map.

### 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.

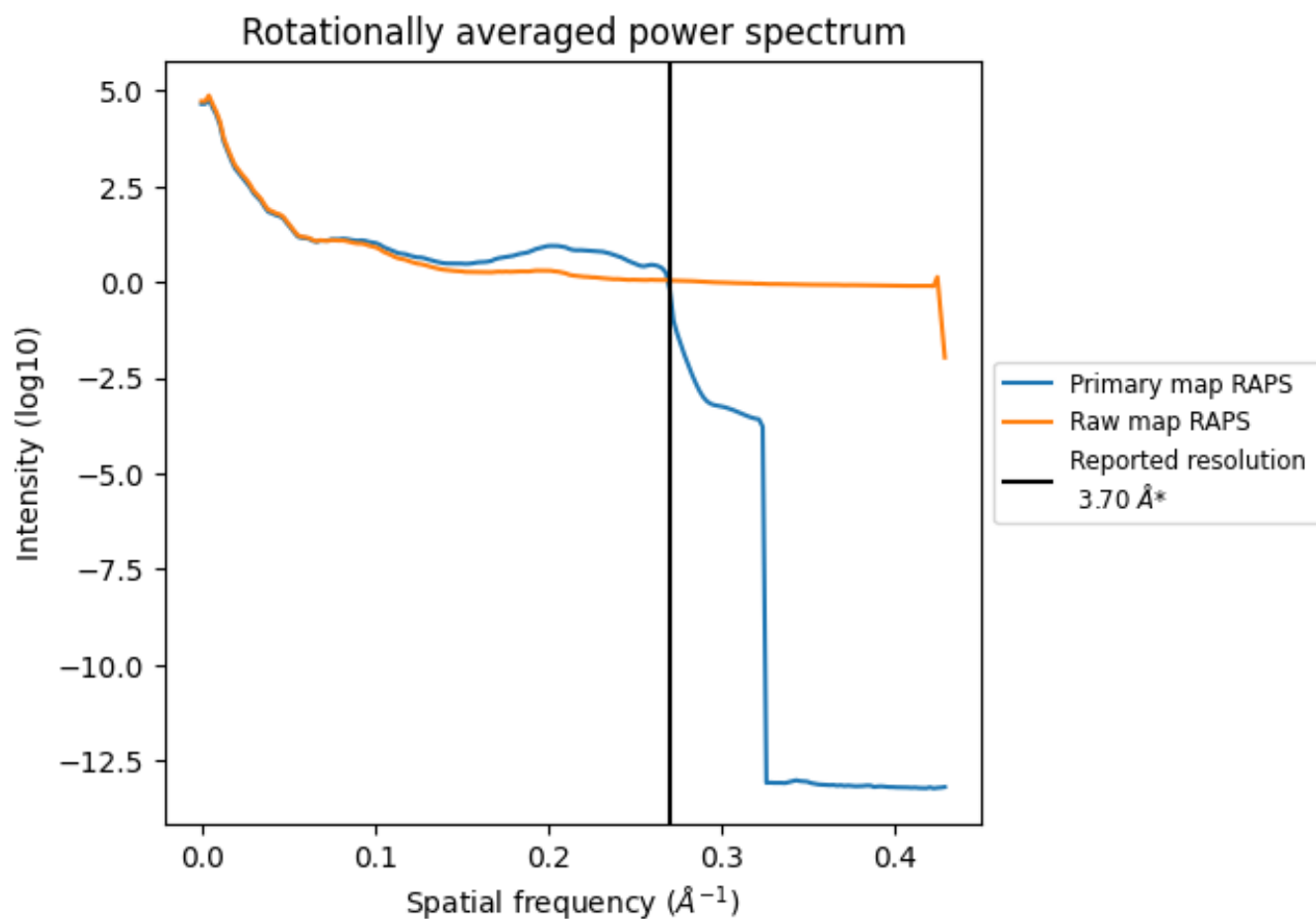
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 448  $\text{nm}^3$ ; this corresponds to an approximate mass of 404 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](#)



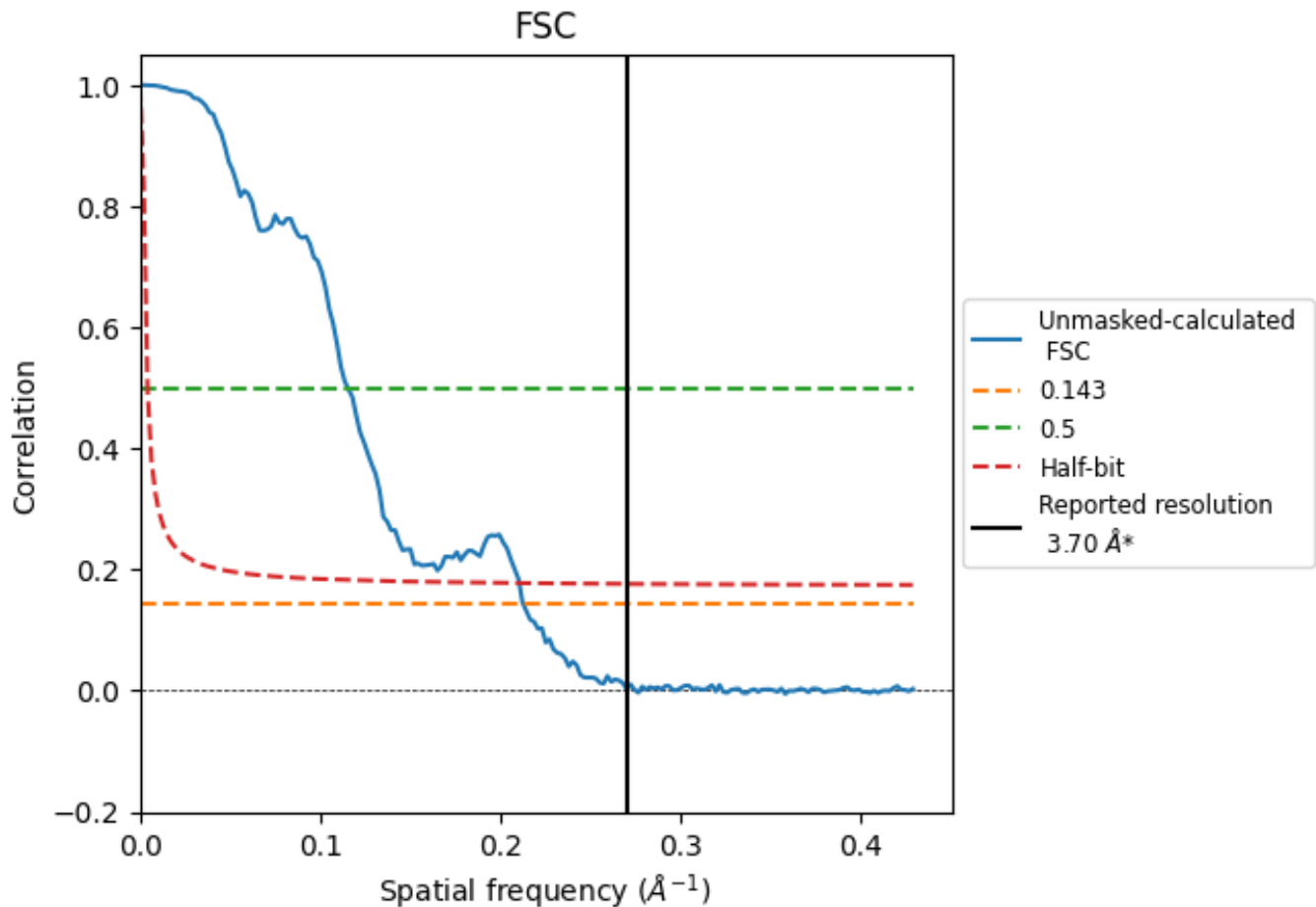
\*Reported resolution corresponds to spatial frequency of 0.270 Å<sup>-1</sup>



## 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 0.270 Å<sup>-1</sup>

## 8.2 Resolution estimates [i](#)

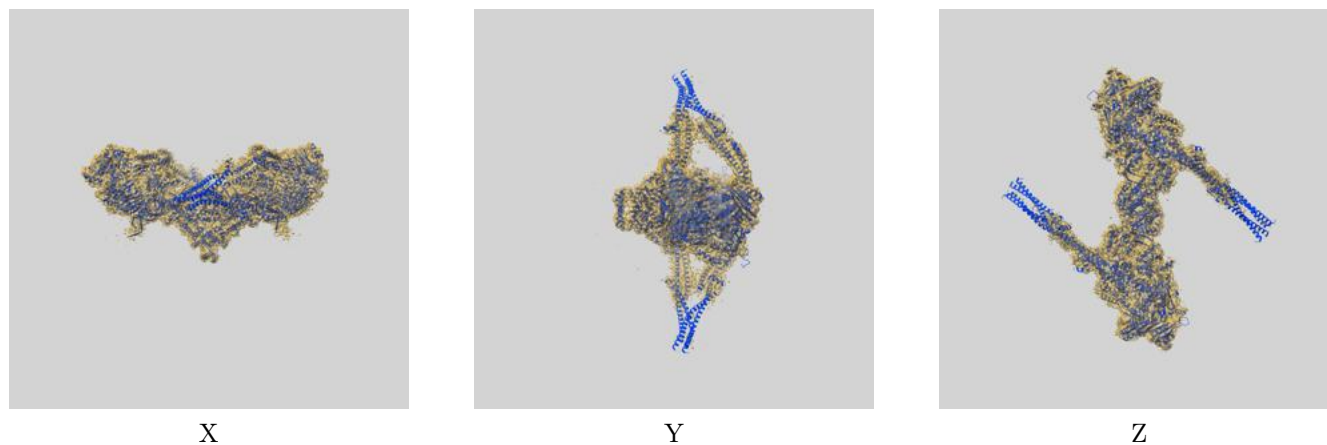
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.70	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	4.70	8.67	4.75

\*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 4.70 differs from the reported value 3.7 by more than 10 %

## 9 Map-model fit [i](#)

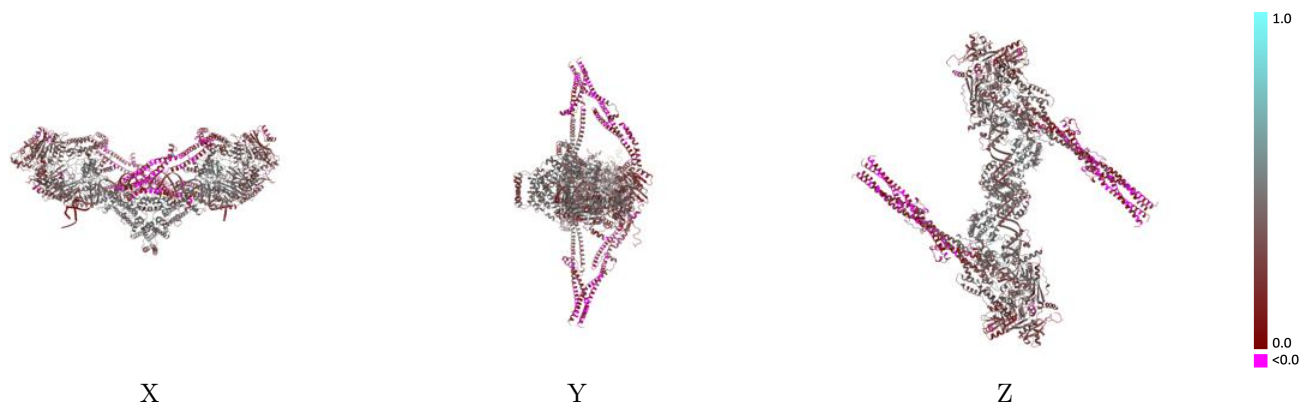
This section contains information regarding the fit between EMDB map EMD-53443 and PDB model 9QXS. Per-residue inclusion information can be found in section 3 on page 7.

### 9.1 Map-model overlay [i](#)



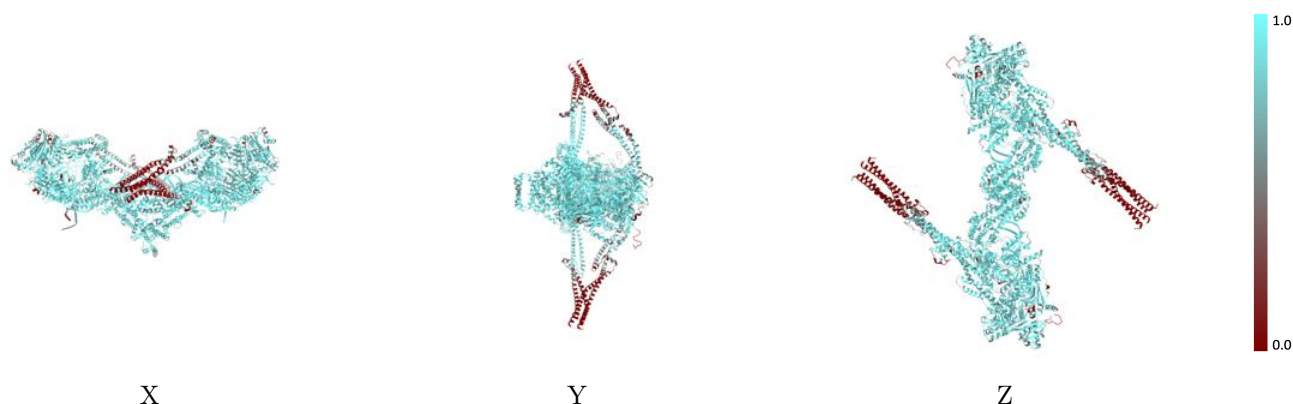
The images above show the 3D surface view of the map at the recommended contour level 0.31 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



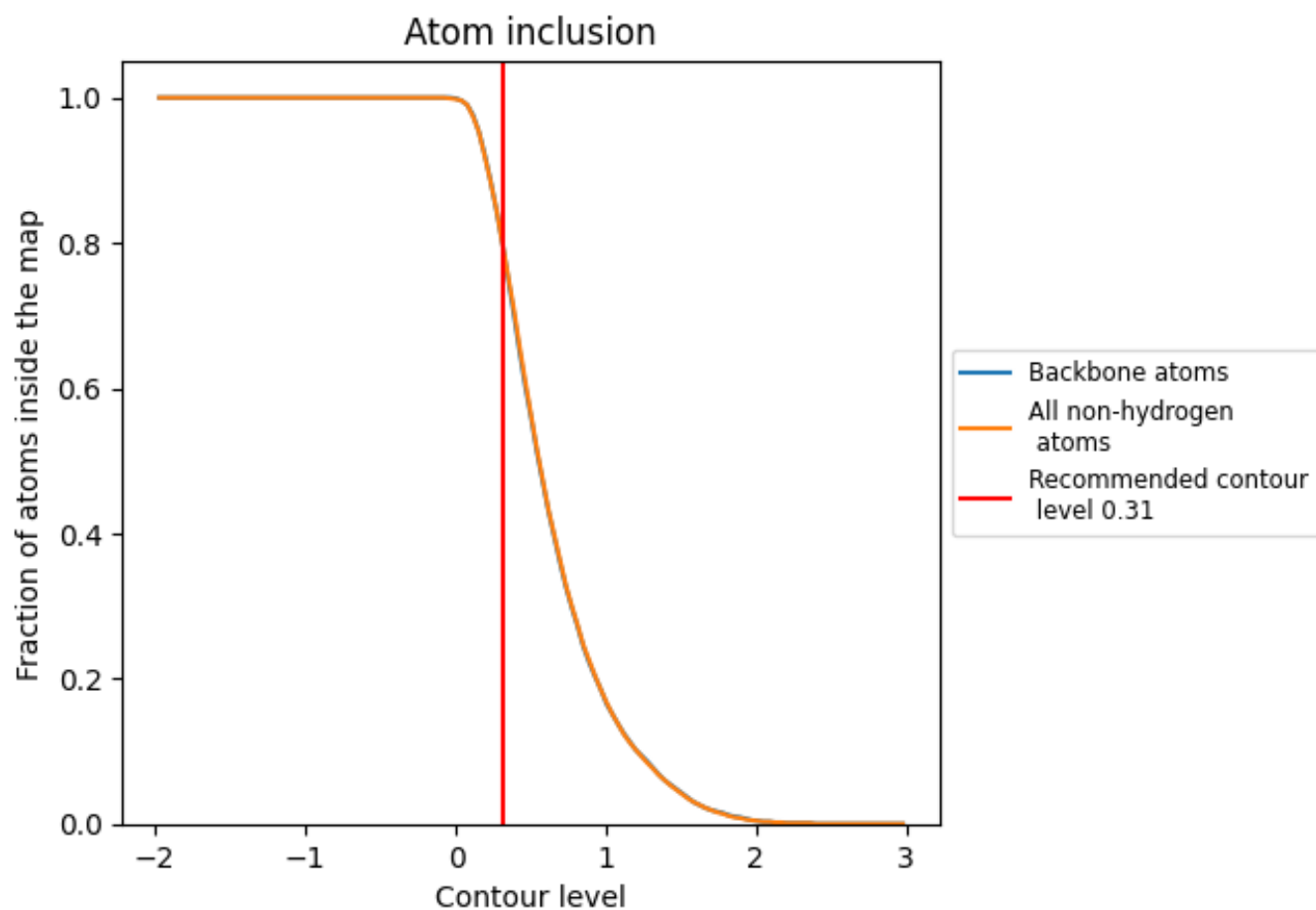
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.31).



























## 9.4 Atom inclusion [i](#)



At the recommended contour level, 80% of all backbone atoms, 80% 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 (0.31) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.8020	 0.3310
A	 0.7900	 0.3160
B	 0.6750	 0.2430
C	 0.9520	 0.4730
D	 0.9100	 0.4350
E	 0.8860	 0.3970
F	 0.7860	 0.3170
G	 0.6720	 0.2410
H	 0.9550	 0.4720
I	 0.9080	 0.4360
P	 0.9180	 0.2910
Q	 0.9260	 0.2900
j	 0.8940	 0.4060

