



Full wwPDB EM Validation Report ⓘ

Oct 13, 2024 – 09:08 am BST

PDB ID : 7ALN
EMDB ID : EMD-11818
Title : Cryo-EM structure of the divergent actomyosin complex from Plasmodium falciparum Myosin A in the Rigor state
Authors : Robert-Paganin, J.; Xu, X.-P.; Swift, M.F.; Auguin, D.; Robblee, J.P.; Lu, H.; Fagnant, P.M.; Krementsova, E.B.; Trybus, K.M.; Houdusse, A.; Volkmann, N.; Hanein, D.
Deposited on : 2020-10-06
Resolution : 3.77 Å(reported)

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

EMDB validation analysis : 0.0.1.dev113
Mogul : 1.8.4, CSD as541be (2020)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.39

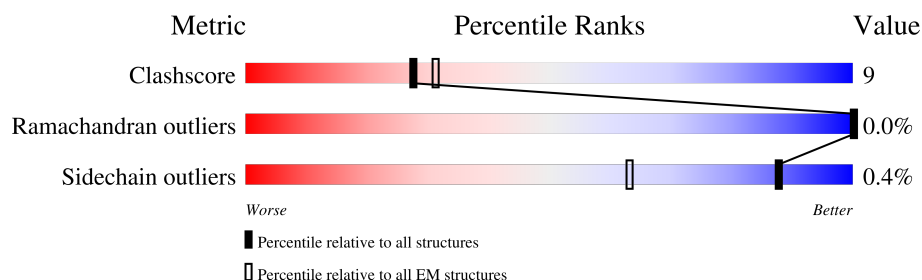
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.77 Å.

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



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

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. 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	376	
1	B	376	
1	C	376	
1	D	376	
1	E	376	
2	F	818	

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

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	SEP	F	19	-	-	X	-

2 Entry composition [i](#)

There are 5 unique types of molecules in this entry. The entry contains 20789 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 Actin-1.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	370	Total	C	N	O	S	0	0
			2890	1829	489	556	16		
1	B	370	Total	C	N	O	S	0	0
			2890	1829	489	556	16		
1	C	370	Total	C	N	O	S	0	0
			2890	1829	489	556	16		
1	D	370	Total	C	N	O	S	0	0
			2890	1829	489	556	16		
1	E	370	Total	C	N	O	S	0	0
			2890	1829	489	556	16		

- Molecule 2 is a protein called Myosin-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	F	766	Total	C	N	O	P S	0	0
			6058	3854	1020	1152	1 31		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
F	417	ASP	THR	engineered mutation	UNP Q8IDR3

- Molecule 3 is ADENOSINE-5'-DIPHOSPHATE (three-letter code: ADP) (formula: $C_{10}H_{15}N_5O_{10}P_2$).

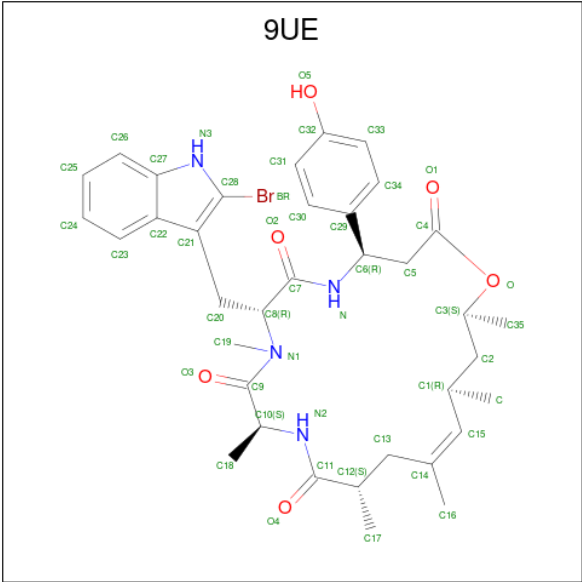


Mol	Chain	Residues	Atoms					AltConf
3	A	1	Total	C	N	O	P	0
			27	10	5	10	2	
3	B	1	Total	C	N	O	P	0
			27	10	5	10	2	
3	C	1	Total	C	N	O	P	0
			27	10	5	10	2	
3	D	1	Total	C	N	O	P	0
			27	10	5	10	2	
3	E	1	Total	C	N	O	P	0
			27	10	5	10	2	

- Molecule 4 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
4	A	1	Total	Mg	0
			1	1	
4	B	1	Total	Mg	0
			1	1	
4	C	1	Total	Mg	0
			1	1	
4	D	1	Total	Mg	0
			1	1	
4	E	1	Total	Mg	0
			1	1	

- Molecule 5 is Jasplakinolide (three-letter code: 9UE) (formula: C₃₆H₄₅BrN₄O₆).

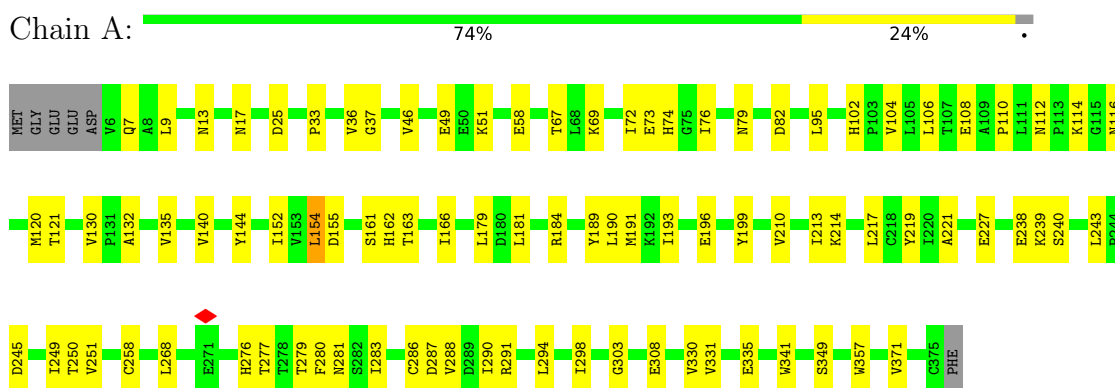


Mol	Chain	Residues	Atoms					AltConf
5	A	1	Total	Br	C	N	O	0
			47	1	36	4	6	
5	C	1	Total	Br	C	N	O	0
			47	1	36	4	6	
5	E	1	Total	Br	C	N	O	0
			47	1	36	4	6	

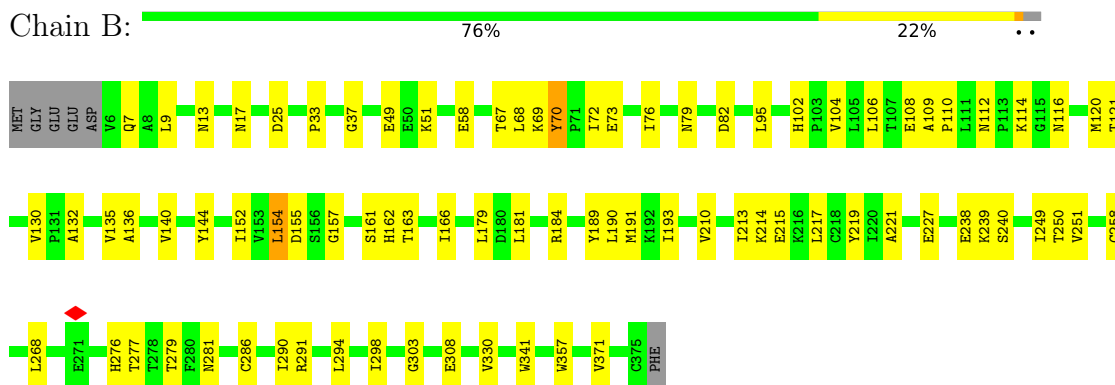
3 Residue-property plots

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.

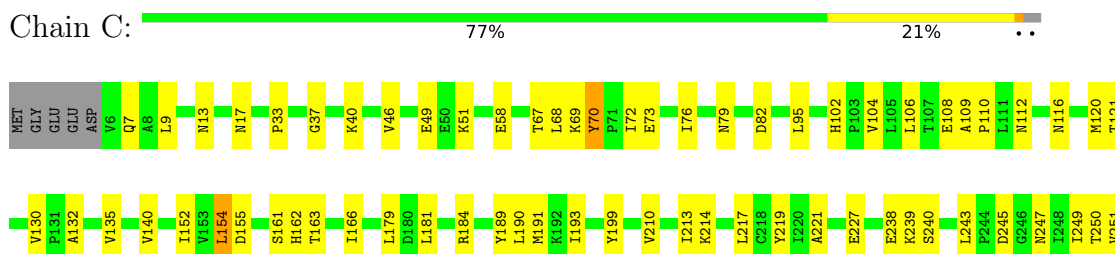
• Molecule 1: Actin-1



• Molecule 1: Actin-1



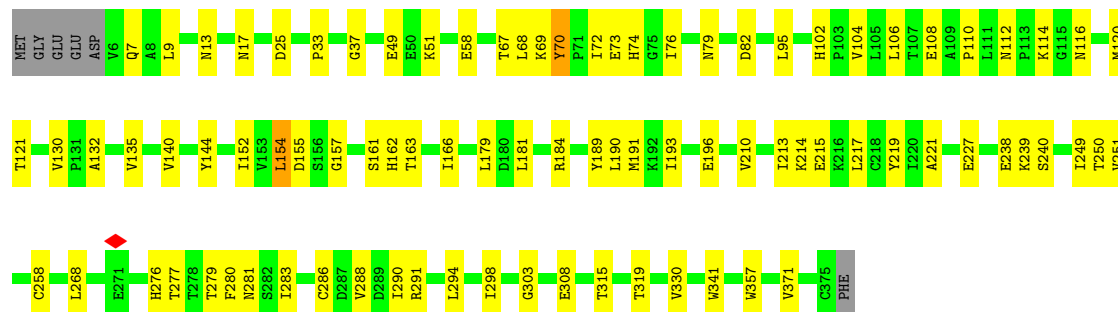
• Molecule 1: Actin-1





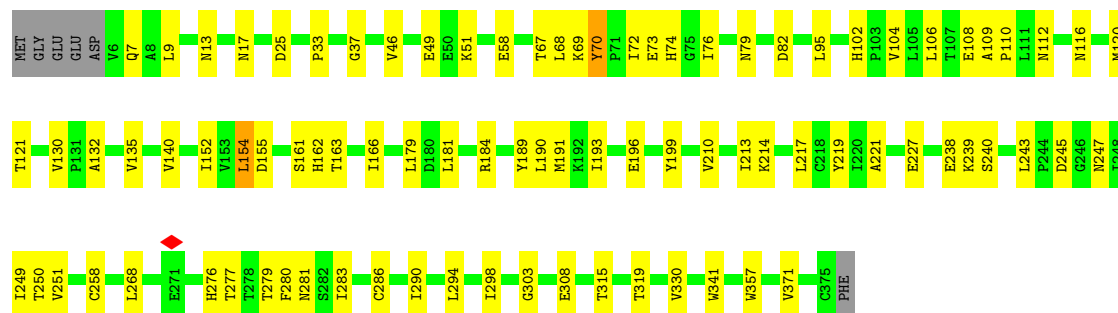
• Molecule 1: Actin-1

Chain D: 75% 23% ..



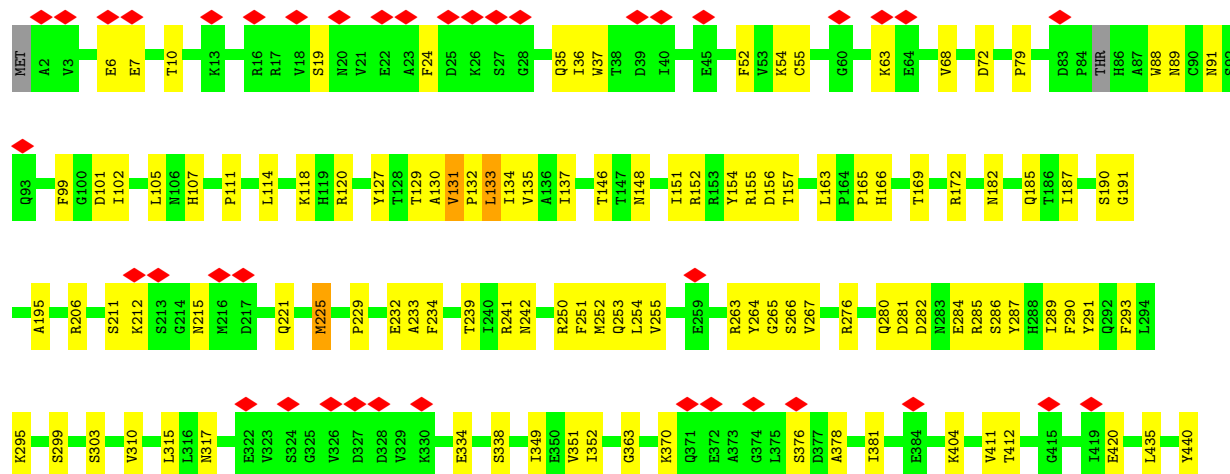
• Molecule 1: Actin-1

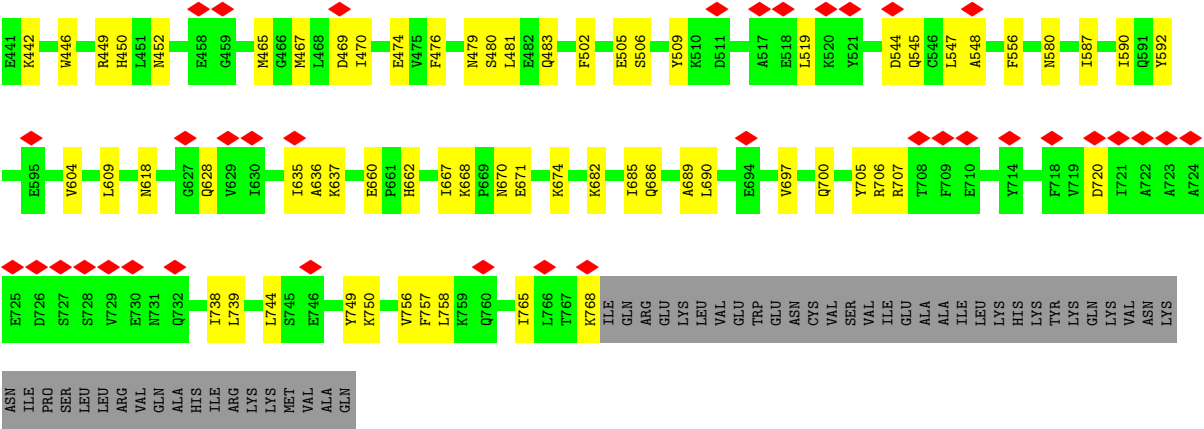
Chain E: 75% 23% ..



• Molecule 2: Myosin-A

Chain F: 9% 72% 21% 6%





4 Experimental information

Property	Value	Source
EM reconstruction method	HELICAL	Depositor
Imposed symmetry	HELICAL, twist=-168.1°, rise=27.3 Å, axial sym=C1	Depositor
Number of segments used	464646	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 ($e^-/\text{Å}^2$)	60.0	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	FEI FALCON II (4k x 4k)	Depositor
Maximum map value	35.041	Depositor
Minimum map value	-4.928	Depositor
Average map value	0.095	Depositor
Map value standard deviation	1.311	Depositor
Recommended contour level	4	Depositor
Map size (Å)	347.75998, 347.75998, 347.75998	wwPDB
Map dimensions	336, 336, 336	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.035, 1.035, 1.035	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: 9UE, ADP, SEP, 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	A	0.42	0/2951	0.55	1/3995 (0.0%)
1	B	0.43	0/2951	0.56	1/3995 (0.0%)
1	C	0.42	0/2951	0.56	1/3995 (0.0%)
1	D	0.42	0/2951	0.55	1/3995 (0.0%)
1	E	0.42	0/2951	0.56	1/3995 (0.0%)
2	F	0.34	0/6153	0.54	1/8297 (0.0%)
All	All	0.40	0/20908	0.55	6/28272 (0.0%)

There are no bond length outliers.

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	154	LEU	CA-CB-CG	5.54	128.05	115.30
1	E	154	LEU	CA-CB-CG	5.54	128.04	115.30
1	B	154	LEU	CA-CB-CG	5.53	128.03	115.30
1	D	154	LEU	CA-CB-CG	5.53	128.03	115.30
1	C	154	LEU	CA-CB-CG	5.53	128.02	115.30
2	F	133	LEU	CA-CB-CG	5.10	127.04	115.30

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	2890	0	2865	60	0
1	B	2890	0	2865	56	0
1	C	2890	0	2865	56	0
1	D	2890	0	2865	56	0
1	E	2890	0	2865	62	0
2	F	6058	0	6125	114	0
3	A	27	0	12	2	0
3	B	27	0	12	5	0
3	C	27	0	12	1	0
3	D	27	0	12	4	0
3	E	27	0	12	2	0
4	A	1	0	0	0	0
4	B	1	0	0	0	0
4	C	1	0	0	0	0
4	D	1	0	0	0	0
4	E	1	0	0	0	0
5	A	47	0	0	4	0
5	C	47	0	0	8	0
5	E	47	0	0	8	0
All	All	20789	0	20510	391	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 9.

All (391) 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)
2:F:130:ALA:HB3	2:F:133:LEU:HB2	1.25	1.14
1:C:199:TYR:HE1	5:C:403:9UE:C35	1.72	1.03
1:E:199:TYR:HE1	5:E:403:9UE:C35	1.76	0.96
2:F:705:TYR:O	2:F:758:LEU:HB2	1.71	0.90
1:C:243:LEU:HD11	5:C:403:9UE:C16	2.01	0.90
1:E:243:LEU:HD11	5:E:403:9UE:C16	2.04	0.89
1:D:214:LYS:NZ	3:D:401:ADP:O2'	2.07	0.87
1:C:199:TYR:CE1	5:C:403:9UE:C35	2.58	0.86
2:F:19:SEP:O3P	2:F:89:ASN:ND2	2.10	0.83
1:C:238:GLU:HA	1:C:251:VAL:O	1.80	0.82
1:A:238:GLU:HA	1:A:251:VAL:O	1.80	0.82
1:B:238:GLU:HA	1:B:251:VAL:O	1.80	0.82
1:E:199:TYR:CE1	5:E:403:9UE:C35	2.62	0.81
1:D:238:GLU:HA	1:D:251:VAL:O	1.80	0.81
1:E:238:GLU:HA	1:E:251:VAL:O	1.80	0.80

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:229:PRO:O	2:F:233:ALA:HB2	1.83	0.79
1:C:243:LEU:CD1	5:C:403:9UE:C16	2.61	0.78
2:F:195:ALA:HA	2:F:668:LYS:HB3	1.65	0.77
2:F:221:GLN:O	2:F:225:MET:HB2	1.85	0.77
1:D:277:THR:O	1:D:281:ASN:HB2	1.85	0.77
1:E:277:THR:O	1:E:281:ASN:HB2	1.85	0.77
1:B:277:THR:O	1:B:281:ASN:HB2	1.85	0.76
1:C:277:THR:O	1:C:281:ASN:HB2	1.85	0.76
1:A:277:THR:O	1:A:281:ASN:HB2	1.85	0.76
1:C:214:LYS:NZ	3:C:401:ADP:O2'	2.18	0.75
2:F:19:SEP:O3P	2:F:107:HIS:ND1	2.18	0.75
1:A:214:LYS:NZ	3:A:401:ADP:O2'	2.18	0.75
2:F:129:THR:HG23	2:F:165:PRO:HB3	1.69	0.73
1:E:243:LEU:CD1	5:E:403:9UE:C16	2.68	0.72
1:C:109:ALA:HB1	1:C:162:HIS:CE1	2.24	0.72
1:A:303:GLY:HA3	3:A:401:ADP:H5'2	1.70	0.71
2:F:239:THR:HG23	2:F:241:ARG:H	1.56	0.71
1:E:214:LYS:NZ	3:E:401:ADP:O2'	2.24	0.69
2:F:114:LEU:O	2:F:118:LYS:HB2	1.91	0.68
1:B:214:LYS:NZ	3:B:401:ADP:O2'	2.27	0.67
2:F:54:LYS:HB3	2:F:72:ASP:HB3	1.75	0.67
2:F:411:VAL:HG22	2:F:420:GLU:HG2	1.75	0.66
1:C:155:ASP:O	1:C:161:SER:HA	1.95	0.66
1:B:109:ALA:HB1	1:B:162:HIS:CE1	2.30	0.66
1:B:155:ASP:O	1:B:161:SER:HA	1.95	0.66
1:D:155:ASP:O	1:D:161:SER:HA	1.95	0.66
1:A:155:ASP:O	1:A:161:SER:HA	1.95	0.66
1:E:155:ASP:O	1:E:161:SER:HA	1.95	0.66
1:E:110:PRO:HD2	1:E:162:HIS:CE1	2.30	0.65
1:E:303:GLY:HA3	3:E:401:ADP:H5'2	1.79	0.65
1:A:349:SER:HB2	2:F:637:LYS:HD3	1.78	0.64
1:B:116:ASN:O	1:B:120:MET:HB2	1.98	0.63
1:C:116:ASN:O	1:C:120:MET:HB2	1.98	0.63
1:D:189:TYR:HB2	1:D:268:LEU:HD21	1.80	0.63
1:E:116:ASN:O	1:E:120:MET:HB2	1.98	0.63
1:A:199:TYR:HE1	5:A:403:9UE:C35	2.10	0.63
1:E:189:TYR:HB2	1:E:268:LEU:HD21	1.80	0.63
1:D:116:ASN:O	1:D:120:MET:HB2	1.98	0.63
2:F:505:GLU:OE1	2:F:706:ARG:NH2	2.32	0.63
1:A:116:ASN:O	1:A:120:MET:HB2	1.98	0.62
1:D:240:SER:HA	1:D:249:ILE:O	1.99	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:189:TYR:HB2	1:B:268:LEU:HD21	1.80	0.62
1:E:240:SER:HA	1:E:249:ILE:O	1.99	0.62
1:D:303:GLY:HA3	3:D:401:ADP:H5'2	1.81	0.62
1:A:331:VAL:HG22	2:F:376:SER:HB3	1.81	0.62
1:A:189:TYR:HB2	1:A:268:LEU:HD21	1.80	0.62
1:C:189:TYR:HB2	1:C:268:LEU:HD21	1.80	0.62
1:B:240:SER:HA	1:B:249:ILE:O	1.99	0.61
1:A:240:SER:HA	1:A:249:ILE:O	1.99	0.61
1:B:303:GLY:HA3	3:B:401:ADP:H5'2	1.81	0.61
1:C:240:SER:HA	1:C:249:ILE:O	1.99	0.61
2:F:36:ILE:O	2:F:54:LYS:HA	2.01	0.61
1:A:335:GLU:OE2	2:F:412:THR:OG1	2.18	0.61
2:F:334:GLU:O	2:F:338:SER:HB2	2.00	0.60
1:E:109:ALA:HB1	1:E:162:HIS:CE1	2.35	0.60
1:C:106:LEU:HB2	1:C:135:VAL:HG12	1.84	0.60
1:A:106:LEU:HB2	1:A:135:VAL:HG12	1.84	0.60
1:E:106:LEU:HB2	1:E:135:VAL:HG12	1.84	0.60
1:A:199:TYR:CE1	5:A:403:9UE:C35	2.84	0.60
2:F:671:GLU:OE2	2:F:682:LYS:NZ	2.34	0.60
1:D:140:VAL:HG12	1:D:166:ILE:HD11	1.84	0.60
1:B:106:LEU:HB2	1:B:135:VAL:HG12	1.84	0.60
1:E:140:VAL:HG12	1:E:166:ILE:HD11	1.84	0.60
1:D:106:LEU:HB2	1:D:135:VAL:HG12	1.84	0.59
2:F:749:TYR:HA	2:F:757:PHE:O	2.02	0.59
1:C:140:VAL:HG12	1:C:166:ILE:HD11	1.84	0.59
2:F:587:ILE:HD11	2:F:590:ILE:HD11	1.85	0.59
2:F:239:THR:HA	2:F:284:GLU:HG2	1.84	0.59
1:A:140:VAL:HG12	1:A:166:ILE:HD11	1.84	0.58
5:C:403:9UE:BR	1:E:74:HIS:CD2	3.11	0.58
2:F:99:PHE:O	2:F:120:ARG:NH1	2.36	0.58
1:D:144:TYR:OH	1:E:46:VAL:N	2.31	0.58
2:F:670:ASN:HD21	2:F:674:LYS:H	1.49	0.58
1:D:154:LEU:HA	1:D:162:HIS:O	2.03	0.58
1:E:154:LEU:HA	1:E:162:HIS:O	2.03	0.58
2:F:211:SER:O	2:F:215:ASN:ND2	2.37	0.58
1:B:140:VAL:HG12	1:B:166:ILE:HD11	1.84	0.58
2:F:37:TRP:HB2	2:F:88:TRP:HB2	1.85	0.58
1:A:245:ASP:OD2	1:B:291:ARG:NH1	2.37	0.57
1:B:154:LEU:HA	1:B:162:HIS:O	2.03	0.57
1:A:154:LEU:HA	1:A:162:HIS:O	2.03	0.57
2:F:146:THR:HB	2:F:206:ARG:HH22	1.68	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:154:LEU:HA	1:C:162:HIS:O	2.03	0.57
1:E:239:LYS:O	1:E:250:THR:HA	2.05	0.57
1:A:239:LYS:O	1:A:250:THR:HA	2.05	0.57
1:D:51:LYS:NZ	1:D:58:GLU:OE1	2.38	0.56
1:B:157:GLY:HA3	3:B:401:ADP:O2B	2.05	0.56
1:B:239:LYS:O	1:B:250:THR:HA	2.05	0.56
1:C:239:LYS:O	1:C:250:THR:HA	2.05	0.56
2:F:229:PRO:HA	2:F:232:GLU:HB2	1.86	0.56
1:A:74:HIS:CD2	5:E:403:9UE:BR	3.14	0.56
2:F:129:THR:HG22	2:F:134:ILE:HD13	1.88	0.56
1:A:51:LYS:NZ	1:A:58:GLU:OE1	2.38	0.55
1:B:109:ALA:HB1	1:B:162:HIS:NE2	2.21	0.55
1:D:239:LYS:O	1:D:250:THR:HA	2.05	0.55
1:E:213:ILE:HG23	1:E:217:LEU:HD12	1.88	0.55
1:B:51:LYS:NZ	1:B:58:GLU:OE1	2.39	0.55
1:D:213:ILE:HG23	1:D:217:LEU:HD12	1.89	0.55
2:F:129:THR:HG23	2:F:165:PRO:CB	2.34	0.55
2:F:137:ILE:HA	2:F:667:ILE:O	2.06	0.55
1:A:286:CYS:HB3	1:A:290:ILE:HD11	1.89	0.55
1:B:121:THR:HG21	1:B:371:VAL:HG21	1.89	0.55
1:C:286:CYS:HB3	1:C:290:ILE:HD11	1.89	0.55
1:C:121:THR:HG21	1:C:371:VAL:HG21	1.89	0.55
1:A:121:THR:HG21	1:A:371:VAL:HG21	1.89	0.54
1:B:286:CYS:HB3	1:B:290:ILE:HD11	1.89	0.54
1:C:108:GLU:HG3	1:C:112:ASN:HD22	1.73	0.54
1:C:51:LYS:NZ	1:C:58:GLU:OE1	2.39	0.54
1:E:219:TYR:HB2	1:E:308:GLU:HB2	1.89	0.54
1:A:104:VAL:HG12	1:A:130:VAL:HG11	1.89	0.54
1:B:104:VAL:HG12	1:B:130:VAL:HG11	1.90	0.54
1:B:213:ILE:HG23	1:B:217:LEU:HD12	1.88	0.54
2:F:19:SEP:P	2:F:89:ASN:HD22	2.29	0.54
1:D:219:TYR:HB2	1:D:308:GLU:HB2	1.89	0.54
1:E:121:THR:HG21	1:E:371:VAL:HG21	1.89	0.54
1:A:213:ILE:HG23	1:A:217:LEU:HD12	1.88	0.54
1:C:213:ILE:HG23	1:C:217:LEU:HD12	1.88	0.54
1:D:121:THR:HG21	1:D:371:VAL:HG21	1.89	0.54
1:E:104:VAL:HG12	1:E:130:VAL:HG11	1.89	0.54
2:F:255:VAL:HB	2:F:264:TYR:HB2	1.90	0.54
1:A:219:TYR:HB2	1:A:308:GLU:HB2	1.89	0.54
1:B:219:TYR:HB2	1:B:308:GLU:HB2	1.89	0.54
2:F:544:ASP:O	2:F:548:ALA:N	2.33	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:104:VAL:HG12	1:C:130:VAL:HG11	1.89	0.54
1:C:219:TYR:HB2	1:C:308:GLU:HB2	1.89	0.54
1:D:104:VAL:HG12	1:D:130:VAL:HG11	1.90	0.53
1:E:51:LYS:NZ	1:E:58:GLU:OE1	2.38	0.53
1:E:152:ILE:HG13	1:E:294:LEU:HD22	1.90	0.53
2:F:547:LEU:HD21	2:F:636:ALA:HB1	1.91	0.53
1:D:286:CYS:HB3	1:D:290:ILE:HD11	1.89	0.53
1:E:286:CYS:HB3	1:E:290:ILE:HD11	1.89	0.53
1:D:108:GLU:HG3	1:D:112:ASN:HD22	1.74	0.53
1:E:116:ASN:O	1:E:120:MET:CB	2.57	0.53
1:D:116:ASN:O	1:D:120:MET:CB	2.57	0.53
1:A:152:ILE:HG13	1:A:294:LEU:HD22	1.90	0.53
2:F:191:GLY:HA2	2:F:690:LEU:HD21	1.91	0.53
1:A:116:ASN:O	1:A:120:MET:CB	2.57	0.53
1:A:288:VAL:HG11	5:C:403:9UE:C17	2.38	0.53
2:F:251:PHE:HE2	2:F:253:GLN:HE21	1.56	0.53
2:F:334:GLU:O	2:F:338:SER:CB	2.57	0.52
1:B:152:ILE:HG13	1:B:294:LEU:HD22	1.90	0.52
1:C:109:ALA:O	1:C:112:ASN:HB2	2.10	0.52
1:C:152:ILE:HG13	1:C:294:LEU:HD22	1.90	0.52
1:D:152:ILE:HG13	1:D:294:LEU:HD22	1.90	0.52
1:E:9:LEU:HD11	1:E:95:LEU:HD13	1.92	0.52
1:D:9:LEU:HD11	1:D:95:LEU:HD13	1.92	0.52
1:A:144:TYR:OH	1:C:46:VAL:N	2.33	0.52
1:C:116:ASN:O	1:C:120:MET:CB	2.57	0.52
1:A:108:GLU:HG3	1:A:112:ASN:HD22	1.74	0.52
1:B:116:ASN:O	1:B:120:MET:CB	2.57	0.52
2:F:127:TYR:HA	2:F:135:VAL:O	2.10	0.52
1:D:76:ILE:HG23	1:D:116:ASN:HD21	1.75	0.52
1:B:9:LEU:HD11	1:B:95:LEU:HD13	1.91	0.52
1:A:9:LEU:HD11	1:A:95:LEU:HD13	1.91	0.52
2:F:252:MET:HG2	2:F:267:VAL:HG22	1.92	0.52
1:A:243:LEU:HD11	5:A:403:9UE:C16	2.40	0.51
1:C:9:LEU:HD11	1:C:95:LEU:HD13	1.91	0.51
1:D:291:ARG:NH1	1:E:245:ASP:OD2	2.43	0.51
2:F:706:ARG:O	2:F:707:ARG:NE	2.38	0.51
1:A:76:ILE:HG23	1:A:116:ASN:HD21	1.75	0.51
1:E:109:ALA:O	1:E:112:ASN:HB2	2.09	0.51
1:D:315:THR:O	1:D:319:THR:OG1	2.27	0.51
1:C:76:ILE:HG23	1:C:116:ASN:HD21	1.75	0.51
2:F:370:LYS:HB2	2:F:378:ALA:HB3	1.91	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:76:ILE:HG23	1:B:116:ASN:HD21	1.75	0.51
2:F:349:ILE:HA	2:F:352:ILE:HD12	1.92	0.51
2:F:435:LEU:HD13	2:F:609:LEU:HD21	1.91	0.51
1:E:76:ILE:HG23	1:E:116:ASN:HD21	1.75	0.51
2:F:720:ASP:HB3	2:F:738:ILE:HG12	1.93	0.51
2:F:545:GLN:HG3	2:F:556:PHE:HB2	1.93	0.51
1:D:191:MET:HG2	1:D:210:VAL:HG21	1.94	0.50
1:B:109:ALA:O	1:B:112:ASN:HB2	2.11	0.50
1:E:191:MET:HG2	1:E:210:VAL:HG21	1.94	0.50
1:E:179:LEU:HD21	1:E:181:LEU:HD12	1.94	0.50
2:F:233:ALA:HB1	2:F:289:ILE:HD13	1.94	0.50
2:F:289:ILE:O	2:F:293:PHE:CB	2.60	0.50
1:D:179:LEU:HD21	1:D:181:LEU:HD12	1.94	0.50
5:A:403:9UE:BR	1:D:74:HIS:CD2	3.20	0.50
1:B:179:LEU:HD21	1:B:181:LEU:HD12	1.94	0.50
2:F:282:ASP:O	2:F:317:ASN:ND2	2.43	0.49
1:A:291:ARG:NH1	1:C:245:ASP:OD2	2.45	0.49
1:A:179:LEU:HD21	1:A:181:LEU:HD12	1.94	0.49
1:B:163:THR:HG21	1:B:279:THR:HA	1.95	0.49
2:F:185:GLN:HA	2:F:660:GLU:O	2.13	0.49
1:C:277:THR:O	1:C:281:ASN:CB	2.59	0.49
2:F:102:ILE:HG23	2:F:105:LEU:HD12	1.93	0.49
2:F:276:ARG:O	2:F:280:GLN:NE2	2.45	0.49
2:F:281:ASP:O	2:F:317:ASN:ND2	2.45	0.49
1:A:191:MET:HG2	1:A:210:VAL:HG21	1.94	0.49
1:B:108:GLU:N	1:B:136:ALA:O	2.35	0.49
2:F:253:GLN:O	2:F:265:GLY:HA2	2.13	0.49
1:B:191:MET:HG2	1:B:210:VAL:HG21	1.94	0.49
1:E:163:THR:HG21	1:E:279:THR:HA	1.95	0.49
2:F:229:PRO:O	2:F:233:ALA:CB	2.58	0.49
1:C:191:MET:HG2	1:C:210:VAL:HG21	1.94	0.49
2:F:166:HIS:HB2	2:F:169:THR:HG23	1.94	0.49
1:A:163:THR:HG21	1:A:279:THR:HA	1.95	0.49
1:C:163:THR:HG21	1:C:279:THR:HA	1.95	0.49
2:F:114:LEU:O	2:F:118:LYS:CB	2.59	0.49
1:D:163:THR:HG21	1:D:279:THR:HA	1.95	0.48
2:F:476:PHE:O	2:F:479:ASN:ND2	2.45	0.48
1:C:13:ASN:HD21	1:C:106:LEU:HD22	1.79	0.48
1:D:13:ASN:HD21	1:D:106:LEU:HD22	1.79	0.48
2:F:151:ILE:O	2:F:155:ARG:HB2	2.14	0.48
2:F:509:TYR:HE2	2:F:519:LEU:HB2	1.78	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:580:ASN:HA	2:F:592:TYR:O	2.14	0.48
2:F:697:VAL:HA	2:F:700:GLN:HG2	1.95	0.48
1:A:46:VAL:N	1:B:144:TYR:OH	2.41	0.48
1:B:13:ASN:HD21	1:B:106:LEU:HD22	1.79	0.48
1:C:179:LEU:HD21	1:C:181:LEU:HD12	1.94	0.48
2:F:151:ILE:O	2:F:155:ARG:CB	2.62	0.48
2:F:442:LYS:HE3	2:F:628:GLN:HE22	1.78	0.48
2:F:295:LYS:HE2	2:F:310:VAL:HG11	1.96	0.48
1:B:277:THR:O	1:B:281:ASN:CB	2.59	0.48
2:F:7:GLU:OE2	2:F:241:ARG:NH2	2.46	0.48
2:F:285:ARG:HE	2:F:291:TYR:HD2	1.62	0.47
1:E:277:THR:O	1:E:281:ASN:CB	2.59	0.47
2:F:68:VAL:O	2:F:79:PRO:HA	2.14	0.47
1:B:108:GLU:HG3	1:B:112:ASN:HD22	1.80	0.47
1:C:190:LEU:HD13	1:C:258:CYS:HB2	1.97	0.47
1:D:190:LEU:HD13	1:D:258:CYS:HB2	1.97	0.47
1:D:215:GLU:HG2	3:D:401:ADP:C5	2.50	0.47
1:E:13:ASN:HD21	1:E:106:LEU:HD22	1.79	0.47
1:E:108:GLU:HG3	1:E:112:ASN:HD22	1.80	0.47
2:F:286:SER:OG	2:F:287:TYR:N	2.48	0.47
1:A:36:VAL:O	1:A:69:LYS:HG2	2.13	0.47
1:C:247:ASN:CG	5:C:403:9UE:C	2.83	0.47
1:D:17:ASN:HA	1:D:33:PRO:HA	1.97	0.47
1:E:190:LEU:HD13	1:E:258:CYS:HB2	1.97	0.47
2:F:24:PHE:HZ	2:F:63:LYS:HG2	1.79	0.47
2:F:99:PHE:HD2	2:F:101:ASP:H	1.61	0.47
1:A:13:ASN:HD21	1:A:106:LEU:HD22	1.79	0.47
2:F:234:PHE:O	2:F:440:TYR:OH	2.33	0.47
1:A:190:LEU:HD13	1:A:258:CYS:HB2	1.97	0.46
1:A:196:GLU:HG2	1:D:114:LYS:HD2	1.97	0.46
1:B:215:GLU:HG2	3:B:401:ADP:C5	2.50	0.46
1:A:277:THR:O	1:A:281:ASN:CB	2.59	0.46
1:B:190:LEU:HD13	1:B:258:CYS:HB2	1.97	0.46
1:D:157:GLY:HA3	3:D:401:ADP:O2B	2.15	0.46
1:E:73:GLU:OE2	1:E:184:ARG:NH2	2.44	0.46
1:E:315:THR:O	1:E:319:THR:OG1	2.27	0.46
2:F:685:ILE:O	2:F:689:ALA:CB	2.64	0.46
1:A:17:ASN:HA	1:A:33:PRO:HA	1.97	0.46
1:E:110:PRO:HD2	1:E:162:HIS:NE2	2.31	0.46
2:F:129:THR:HA	2:F:134:ILE:HD12	1.97	0.46
2:F:154:TYR:HD1	2:F:163:LEU:HD13	1.81	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:252:MET:HA	2:F:266:SER:O	2.15	0.46
1:E:221:ALA:HB1	1:E:227:GLU:HG3	1.98	0.45
1:D:221:ALA:HB1	1:D:227:GLU:HG3	1.98	0.45
2:F:35:GLN:HA	2:F:55:CYS:O	2.16	0.45
1:C:221:ALA:HB1	1:C:227:GLU:HG3	1.98	0.45
1:E:17:ASN:HA	1:E:33:PRO:HA	1.97	0.45
2:F:765:ILE:HA	2:F:768:LYS:HE3	1.97	0.45
1:C:7:GLN:O	1:C:102:HIS:ND1	2.49	0.45
1:C:73:GLU:OE2	1:C:184:ARG:NH2	2.44	0.45
2:F:19:SEP:P	2:F:107:HIS:HD1	2.38	0.45
2:F:251:PHE:HA	2:F:467:MET:O	2.16	0.45
1:D:49:GLU:HG2	1:D:51:LYS:HB2	1.99	0.45
1:A:189:TYR:CE2	1:A:193:ILE:HD11	2.52	0.45
1:B:189:TYR:CE2	1:B:193:ILE:HD11	2.52	0.45
1:B:221:ALA:HB1	1:B:227:GLU:HG3	1.98	0.45
2:F:502:PHE:O	2:F:506:SER:OG	2.29	0.45
1:B:17:ASN:HA	1:B:33:PRO:HA	1.97	0.45
1:E:49:GLU:HG2	1:E:51:LYS:HB2	1.99	0.45
1:E:189:TYR:CE2	1:E:193:ILE:HD11	2.52	0.45
2:F:101:ASP:HA	2:F:129:THR:O	2.16	0.45
1:A:221:ALA:HB1	1:A:227:GLU:HG3	1.98	0.44
1:D:189:TYR:CE2	1:D:193:ILE:HD11	2.52	0.44
1:E:247:ASN:CG	5:E:403:9UE:C	2.85	0.44
2:F:52:PHE:CG	2:F:111:PRO:HB3	2.53	0.44
1:C:17:ASN:HA	1:C:33:PRO:HA	1.97	0.44
1:C:189:TYR:CE2	1:C:193:ILE:HD11	2.52	0.44
2:F:157:THR:O	2:F:172:ARG:NH2	2.36	0.44
2:F:187:ILE:HA	2:F:662:HIS:O	2.17	0.44
1:A:7:GLN:O	1:A:102:HIS:ND1	2.49	0.44
1:B:49:GLU:HG2	1:B:51:LYS:HB2	1.99	0.44
1:B:79:ASN:ND2	1:B:82:ASP:OD2	2.51	0.44
2:F:211:SER:OG	2:F:212:LYS:N	2.50	0.44
1:A:79:ASN:ND2	1:A:82:ASP:OD2	2.51	0.44
1:D:73:GLU:OE2	1:D:184:ARG:NH2	2.44	0.44
1:A:49:GLU:HG2	1:A:51:LYS:HB2	1.99	0.44
1:C:49:GLU:HG2	1:C:51:LYS:HB2	1.99	0.44
1:C:79:ASN:ND2	1:C:82:ASP:OD2	2.51	0.44
1:E:7:GLN:O	1:E:102:HIS:ND1	2.49	0.44
2:F:480:SER:OG	2:F:481:LEU:N	2.49	0.44
1:A:276:HIS:CD2	1:A:277:THR:HG23	2.53	0.44
1:B:132:ALA:HB1	1:B:357:TRP:HB3	2.00	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:109:ALA:HB1	1:C:162:HIS:NE2	2.33	0.44
1:D:7:GLN:O	1:D:102:HIS:ND1	2.49	0.44
1:B:215:GLU:HA	3:B:401:ADP:N1	2.33	0.43
2:F:750:LYS:O	2:F:757:PHE:HB2	2.19	0.43
1:E:79:ASN:ND2	1:E:82:ASP:OD2	2.51	0.43
2:F:241:ARG:HA	2:F:241:ARG:HD3	1.89	0.43
1:C:276:HIS:CD2	1:C:277:THR:HG23	2.53	0.43
1:B:276:HIS:CD2	1:B:277:THR:HG23	2.53	0.43
1:D:132:ALA:HB1	1:D:357:TRP:HB3	2.00	0.43
2:F:6:GLU:O	2:F:10:THR:OG1	2.32	0.43
2:F:446:TRP:CE2	2:F:450:HIS:HE1	2.37	0.43
1:D:277:THR:O	1:D:281:ASN:CB	2.59	0.43
2:F:152:ARG:O	2:F:156:ASP:HB2	2.18	0.43
2:F:502:PHE:O	2:F:506:SER:CB	2.67	0.43
1:A:132:ALA:HB1	1:A:357:TRP:HB3	2.00	0.43
1:B:7:GLN:O	1:B:102:HIS:ND1	2.49	0.43
1:C:132:ALA:HB1	1:C:357:TRP:HB3	2.00	0.43
1:D:79:ASN:ND2	1:D:82:ASP:OD2	2.51	0.43
2:F:668:LYS:O	2:F:668:LYS:HG3	2.19	0.43
2:F:739:LEU:HD22	2:F:744:LEU:HD22	1.99	0.43
1:A:73:GLU:OE2	1:A:184:ARG:NH2	2.44	0.43
1:A:110:PRO:HD2	1:A:162:HIS:CE1	2.54	0.43
1:D:110:PRO:HD2	1:D:162:HIS:CE1	2.54	0.43
1:D:288:VAL:HG11	5:E:403:9UE:C17	2.49	0.43
2:F:131:VAL:HA	2:F:132:PRO:HA	1.74	0.43
2:F:286:SER:HG	2:F:290:PHE:HD2	1.67	0.43
2:F:351:VAL:HG11	2:F:618:ASN:HD21	1.84	0.43
1:B:37:GLY:HA3	1:B:68:LEU:HD23	2.01	0.43
1:C:110:PRO:HD2	1:C:162:HIS:CE1	2.54	0.43
1:E:276:HIS:CD2	1:E:277:THR:HG23	2.53	0.42
1:B:110:PRO:HD2	1:B:162:HIS:CE1	2.54	0.42
1:E:132:ALA:HB1	1:E:357:TRP:HB3	2.00	0.42
2:F:250:ARG:NH2	2:F:469:ASP:OD2	2.51	0.42
2:F:381:ILE:HD12	2:F:404:LYS:HG3	2.00	0.42
1:B:37:GLY:HA2	1:B:67:THR:O	2.19	0.42
1:B:70:TYR:N	1:B:70:TYR:CD2	2.88	0.42
1:A:287:ASP:OD2	1:C:40:LYS:NZ	2.49	0.42
1:D:276:HIS:CD2	1:D:277:THR:HG23	2.53	0.42
1:A:72:ILE:O	1:A:184:ARG:NH1	2.53	0.42
1:C:72:ILE:O	1:C:184:ARG:NH1	2.53	0.42
1:D:37:GLY:HA3	1:D:68:LEU:HD23	2.01	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:72:ILE:O	1:D:184:ARG:NH1	2.53	0.42
1:E:37:GLY:HA3	1:E:68:LEU:HD23	2.01	0.42
1:A:298:ILE:HB	1:A:330:VAL:HG12	2.02	0.42
1:C:37:GLY:HA3	1:C:68:LEU:HD23	2.01	0.42
1:C:70:TYR:N	1:C:70:TYR:CD2	2.88	0.42
2:F:299:SER:O	2:F:303:SER:CB	2.68	0.42
1:A:114:LYS:HD2	1:E:196:GLU:HG2	2.01	0.42
1:B:72:ILE:O	1:B:184:ARG:NH1	2.53	0.42
1:E:72:ILE:O	1:E:184:ARG:NH1	2.53	0.42
1:D:298:ILE:HB	1:D:330:VAL:HG12	2.02	0.42
1:E:25:ASP:HB2	1:E:341:TRP:HH2	1.85	0.42
2:F:289:ILE:O	2:F:293:PHE:HB3	2.20	0.42
2:F:315:LEU:HG	2:F:363:GLY:HA3	2.02	0.42
2:F:667:ILE:HG12	2:F:686:GLN:HB3	2.01	0.42
1:A:37:GLY:HA2	1:A:67:THR:O	2.19	0.41
1:B:298:ILE:HB	1:B:330:VAL:HG12	2.02	0.41
1:C:37:GLY:HA2	1:C:67:THR:O	2.19	0.41
2:F:254:LEU:O	2:F:465:MET:HB3	2.21	0.41
1:C:69:LYS:O	1:C:69:LYS:HG3	2.20	0.41
1:D:69:LYS:O	1:D:69:LYS:HG3	2.20	0.41
1:D:70:TYR:N	1:D:70:TYR:CD2	2.88	0.41
2:F:267:VAL:O	2:F:452:ASN:ND2	2.38	0.41
1:E:70:TYR:N	1:E:70:TYR:CD2	2.88	0.41
2:F:442:LYS:HA	2:F:442:LYS:HD3	1.89	0.41
1:E:298:ILE:HB	1:E:330:VAL:HG12	2.02	0.41
1:C:298:ILE:HB	1:C:330:VAL:HG12	2.02	0.41
1:D:37:GLY:HA2	1:D:67:THR:O	2.20	0.41
2:F:148:ASN:HA	2:F:151:ILE:HD12	2.01	0.41
1:E:37:GLY:HA2	1:E:67:THR:O	2.19	0.41
1:E:249:ILE:HD11	5:E:403:9UE:C16	2.50	0.41
2:F:706:ARG:HA	2:F:756:VAL:O	2.21	0.41
5:C:403:9UE:BR	1:E:74:HIS:CG	3.29	0.41
1:D:280:PHE:HA	1:D:283:ILE:HD12	2.03	0.41
2:F:190:SER:HA	2:F:470:ILE:O	2.20	0.41
2:F:604:VAL:HG13	2:F:635:ILE:HD11	2.03	0.41
1:B:69:LYS:O	1:B:69:LYS:HG3	2.20	0.41
1:E:280:PHE:HA	1:E:283:ILE:HD12	2.03	0.41
1:E:69:LYS:O	1:E:69:LYS:HG3	2.20	0.40
2:F:446:TRP:HA	2:F:449:ARG:HE	1.84	0.40
1:B:73:GLU:OE2	1:B:184:ARG:NH2	2.44	0.40
1:C:280:PHE:HA	1:C:283:ILE:HD12	2.03	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:280:PHE:HA	1:A:283:ILE:HD12	2.03	0.40
1:B:25:ASP:HB2	1:B:341:TRP:HH2	1.85	0.40
1:B:114:LYS:HD2	1:D:196:GLU:HG2	2.02	0.40
1:D:25:ASP:HB2	1:D:341:TRP:HH2	1.85	0.40
2:F:19:SEP:O3P	2:F:107:HIS:CE1	2.73	0.40
1:A:25:ASP:HB2	1:A:341:TRP:HH2	1.85	0.40
2:F:474:GLU:HG2	2:F:483:GLN:HG2	2.04	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	368/376 (98%)	353 (96%)	15 (4%)	0	100	100
1	B	368/376 (98%)	353 (96%)	15 (4%)	0	100	100
1	C	368/376 (98%)	353 (96%)	15 (4%)	0	100	100
1	D	368/376 (98%)	353 (96%)	15 (4%)	0	100	100
1	E	368/376 (98%)	353 (96%)	15 (4%)	0	100	100
2	F	761/818 (93%)	727 (96%)	33 (4%)	1 (0%)	48	79
All	All	2601/2698 (96%)	2492 (96%)	108 (4%)	1 (0%)	100	100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	F	131	VAL

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	317/322 (98%)	317 (100%)	0	100	100
1	B	317/322 (98%)	316 (100%)	1 (0%)	91	94
1	C	317/322 (98%)	316 (100%)	1 (0%)	91	94
1	D	317/322 (98%)	316 (100%)	1 (0%)	91	94
1	E	317/322 (98%)	316 (100%)	1 (0%)	91	94
2	F	677/725 (93%)	672 (99%)	5 (1%)	81	87
All	All	2262/2335 (97%)	2253 (100%)	9 (0%)	88	93

All (9) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	70	TYR
1	C	70	TYR
1	D	70	TYR
1	E	70	TYR
2	F	91	ASN
2	F	182	ASN
2	F	225	MET
2	F	242	ASN
2	F	263	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (14) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	116	ASN
1	A	162	HIS
1	B	116	ASN
1	C	116	ASN
1	D	116	ASN
1	D	162	HIS
1	E	116	ASN
2	F	91	ASN

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Mol	Chain	Res	Type
2	F	182	ASN
2	F	215	ASN
2	F	221	GLN
2	F	253	GLN
2	F	341	ASN
2	F	628	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

1 non-standard protein/DNA/RNA residue is 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	$\# Z > 2$
2	SEP	F	19	2	8,9,10	0.65	0	8,12,14	0.60	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
2	SEP	F	19	2	-	0/5/8/10	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

1 monomer is involved in 5 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	F	19	SEP	5	0

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 13 ligands modelled in this entry, 5 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
3	ADP	C	401	4	24,29,29	2.22	11 (45%)	29,45,45	1.53	4 (13%)
5	9UE	E	403	-	47,50,50	0.59	1 (2%)	60,71,71	1.22	5 (8%)
3	ADP	A	401	4	24,29,29	2.23	13 (54%)	29,45,45	1.58	4 (13%)
5	9UE	A	403	-	47,50,50	0.60	1 (2%)	60,71,71	1.23	5 (8%)
3	ADP	E	401	4	24,29,29	2.21	12 (50%)	29,45,45	1.59	4 (13%)
3	ADP	B	401	4	24,29,29	2.22	13 (54%)	29,45,45	1.41	4 (13%)
3	ADP	D	401	4	24,29,29	2.23	13 (54%)	29,45,45	1.50	4 (13%)
5	9UE	C	403	-	47,50,50	0.60	1 (2%)	60,71,71	1.22	5 (8%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	ADP	C	401	4	-	4/12/32/32	0/3/3/3
5	9UE	E	403	-	-	29/54/56/56	0/3/4/4
3	ADP	A	401	4	-	6/12/32/32	0/3/3/3

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	9UE	A	403	-	-	29/54/56/56	0/3/4/4
3	ADP	E	401	4	-	6/12/32/32	0/3/3/3
3	ADP	B	401	4	-	6/12/32/32	0/3/3/3
3	ADP	D	401	4	-	6/12/32/32	0/3/3/3
5	9UE	C	403	-	-	29/54/56/56	0/3/4/4

All (65) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	E	401	ADP	C2'-C1'	-4.93	1.46	1.53
3	A	401	ADP	C2'-C1'	-4.91	1.46	1.53
3	D	401	ADP	C2'-C1'	-4.91	1.46	1.53
3	C	401	ADP	C2'-C1'	-4.90	1.46	1.53
3	B	401	ADP	C2'-C1'	-4.80	1.46	1.53
3	D	401	ADP	C4-N3	-4.00	1.30	1.35
3	B	401	ADP	C4-N3	-3.98	1.30	1.35
3	E	401	ADP	C4-N3	-3.76	1.30	1.35
3	A	401	ADP	C4-N3	-3.76	1.30	1.35
3	C	401	ADP	C4-N3	-3.74	1.30	1.35
3	C	401	ADP	O4'-C4'	-3.14	1.38	1.45
3	B	401	ADP	O4'-C4'	-3.01	1.38	1.45
3	A	401	ADP	O4'-C4'	-2.99	1.38	1.45
3	D	401	ADP	O4'-C4'	-2.94	1.38	1.45
3	E	401	ADP	O4'-C4'	-2.91	1.38	1.45
3	B	401	ADP	C5-N7	-2.79	1.29	1.39
3	D	401	ADP	C5-N7	-2.75	1.29	1.39
3	C	401	ADP	C5-N7	-2.69	1.30	1.39
3	E	401	ADP	C5-N7	-2.69	1.30	1.39
3	A	401	ADP	C5-N7	-2.68	1.30	1.39
3	A	401	ADP	C2'-C3'	-2.62	1.46	1.53
3	B	401	ADP	C2'-C3'	-2.61	1.46	1.53
3	D	401	ADP	C2'-C3'	-2.60	1.46	1.53
3	E	401	ADP	C2'-C3'	-2.57	1.46	1.53
3	C	401	ADP	C2'-C3'	-2.49	1.46	1.53
3	A	401	ADP	C3'-C4'	-2.41	1.46	1.53
3	C	401	ADP	C3'-C4'	-2.39	1.46	1.53
3	E	401	ADP	PB-O2B	-2.38	1.45	1.54
3	B	401	ADP	PB-O3B	-2.37	1.45	1.54
5	A	403	9UE	BR-C28	-2.37	1.86	1.90
3	A	401	ADP	PB-O3B	-2.36	1.45	1.54
3	E	401	ADP	PB-O3B	-2.34	1.45	1.54

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	D	401	ADP	PB-O3B	-2.34	1.45	1.54
3	C	401	ADP	PB-O2B	-2.34	1.45	1.54
3	C	401	ADP	PB-O3B	-2.33	1.45	1.54
3	E	401	ADP	C3'-C4'	-2.32	1.47	1.53
5	C	403	9UE	BR-C28	-2.31	1.86	1.90
3	A	401	ADP	PB-O2B	-2.29	1.46	1.54
3	D	401	ADP	PB-O2B	-2.28	1.46	1.54
5	E	403	9UE	BR-C28	-2.27	1.86	1.90
3	B	401	ADP	PB-O2B	-2.27	1.46	1.54
3	D	401	ADP	C3'-C4'	-2.27	1.47	1.53
3	E	401	ADP	O4'-C1'	-2.27	1.37	1.41
3	B	401	ADP	C3'-C4'	-2.23	1.47	1.53
3	A	401	ADP	O4'-C1'	-2.20	1.38	1.41
3	C	401	ADP	O4'-C1'	-2.20	1.38	1.41
3	A	401	ADP	C2-N1	-2.18	1.29	1.33
3	A	401	ADP	O3'-C3'	-2.16	1.37	1.43
3	D	401	ADP	C2-N1	-2.15	1.29	1.33
3	B	401	ADP	O4'-C1'	-2.14	1.38	1.41
3	E	401	ADP	O3'-C3'	-2.13	1.38	1.43
3	E	401	ADP	C2-N1	-2.12	1.30	1.33
3	C	401	ADP	C2-N1	-2.11	1.30	1.33
3	D	401	ADP	O3'-C3'	-2.11	1.38	1.43
3	E	401	ADP	PA-O2A	-2.09	1.45	1.55
3	B	401	ADP	C2-N1	-2.06	1.30	1.33
3	A	401	ADP	O2'-C2'	-2.05	1.38	1.43
3	D	401	ADP	PA-O2A	-2.05	1.45	1.55
3	A	401	ADP	PA-O2A	-2.05	1.45	1.55
3	D	401	ADP	O4'-C1'	-2.04	1.38	1.41
3	C	401	ADP	PA-O2A	-2.03	1.45	1.55
3	B	401	ADP	O3'-C3'	-2.03	1.38	1.43
3	B	401	ADP	PA-O2A	-2.03	1.45	1.55
3	B	401	ADP	C8-N7	-2.02	1.31	1.34
3	D	401	ADP	O2'-C2'	-2.00	1.38	1.43

All (35) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	401	ADP	PA-O3A-PB	-4.61	117.01	132.83
3	E	401	ADP	PA-O3A-PB	-4.55	117.22	132.83
3	C	401	ADP	PA-O3A-PB	-4.42	117.65	132.83
3	D	401	ADP	PA-O3A-PB	-4.41	117.70	132.83
5	E	403	9UE	C6-N-C7	-4.34	116.69	123.19

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	C	403	9UE	C6-N-C7	-4.31	116.73	123.19
5	A	403	9UE	C6-N-C7	-4.30	116.74	123.19
3	B	401	ADP	PA-O3A-PB	-3.62	120.41	132.83
5	A	403	9UE	C12-C11-N2	3.55	120.23	116.42
3	E	401	ADP	C3'-C2'-C1'	3.48	106.22	100.98
5	E	403	9UE	C12-C11-N2	3.48	120.15	116.42
5	C	403	9UE	C12-C11-N2	3.45	120.12	116.42
3	C	401	ADP	C3'-C2'-C1'	3.45	106.17	100.98
3	A	401	ADP	C3'-C2'-C1'	3.38	106.07	100.98
5	C	403	9UE	C5-C6-C29	3.29	119.03	111.59
5	A	403	9UE	C5-C6-C29	3.28	119.00	111.59
5	E	403	9UE	C5-C6-C29	3.27	118.97	111.59
3	E	401	ADP	N3-C2-N1	-3.24	123.62	128.68
3	D	401	ADP	C3'-C2'-C1'	3.01	105.52	100.98
3	C	401	ADP	N3-C2-N1	-2.97	124.04	128.68
3	B	401	ADP	C3'-C2'-C1'	2.93	105.39	100.98
3	A	401	ADP	N3-C2-N1	-2.89	124.16	128.68
3	A	401	ADP	C4-C5-N7	-2.88	106.39	109.40
5	A	403	9UE	O4-C11-C12	-2.87	115.86	121.33
3	B	401	ADP	C4-C5-N7	-2.86	106.42	109.40
3	D	401	ADP	N3-C2-N1	-2.86	124.21	128.68
3	B	401	ADP	N3-C2-N1	-2.80	124.31	128.68
5	C	403	9UE	O4-C11-C12	-2.79	116.00	121.33
5	E	403	9UE	O4-C11-C12	-2.78	116.02	121.33
3	C	401	ADP	C4-C5-N7	-2.68	106.61	109.40
3	D	401	ADP	C4-C5-N7	-2.63	106.65	109.40
3	E	401	ADP	C4-C5-N7	-2.59	106.70	109.40
5	A	403	9UE	C10-N2-C11	2.29	126.25	121.29
5	E	403	9UE	C10-N2-C11	2.29	126.25	121.29
5	C	403	9UE	C10-N2-C11	2.25	126.16	121.29

There are no chirality outliers.

All (115) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	401	ADP	C5'-O5'-PA-O1A
3	A	401	ADP	C5'-O5'-PA-O2A
3	B	401	ADP	C5'-O5'-PA-O1A
3	B	401	ADP	C5'-O5'-PA-O2A
3	C	401	ADP	C3'-C4'-C5'-O5'
3	D	401	ADP	C5'-O5'-PA-O1A
3	D	401	ADP	C5'-O5'-PA-O2A

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Mol	Chain	Res	Type	Atoms
3	E	401	ADP	C5'-O5'-PA-O2A
3	E	401	ADP	C5'-O5'-PA-O3A
5	A	403	9UE	C-C1-C2-C3
5	A	403	9UE	C2-C1-C15-C14
5	A	403	9UE	C4-C5-C6-C29
5	A	403	9UE	C21-C20-C8-N1
5	A	403	9UE	C21-C20-C8-C7
5	A	403	9UE	C12-C11-N2-C10
5	A	403	9UE	C17-C12-C13-C14
5	A	403	9UE	C11-C12-C13-C14
5	A	403	9UE	O4-C11-C12-C13
5	A	403	9UE	N2-C11-C12-C13
5	A	403	9UE	C7-C8-N1-C19
5	A	403	9UE	C7-C8-N1-C9
5	C	403	9UE	C-C1-C2-C3
5	C	403	9UE	C2-C1-C15-C14
5	C	403	9UE	C4-C5-C6-C29
5	C	403	9UE	C21-C20-C8-N1
5	C	403	9UE	C21-C20-C8-C7
5	C	403	9UE	C12-C11-N2-C10
5	C	403	9UE	C17-C12-C13-C14
5	C	403	9UE	C11-C12-C13-C14
5	C	403	9UE	O4-C11-C12-C13
5	C	403	9UE	N2-C11-C12-C13
5	C	403	9UE	C7-C8-N1-C19
5	C	403	9UE	C7-C8-N1-C9
5	E	403	9UE	C-C1-C2-C3
5	E	403	9UE	C2-C1-C15-C14
5	E	403	9UE	C4-C5-C6-C29
5	E	403	9UE	C21-C20-C8-N1
5	E	403	9UE	C21-C20-C8-C7
5	E	403	9UE	C12-C11-N2-C10
5	E	403	9UE	C17-C12-C13-C14
5	E	403	9UE	C11-C12-C13-C14
5	E	403	9UE	O4-C11-C12-C13
5	E	403	9UE	N2-C11-C12-C13
5	E	403	9UE	C7-C8-N1-C19
5	E	403	9UE	C7-C8-N1-C9
5	C	403	9UE	O4-C11-N2-C10
5	A	403	9UE	O4-C11-N2-C10
5	E	403	9UE	O4-C11-N2-C10
5	A	403	9UE	C18-C10-N2-C11

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Mol	Chain	Res	Type	Atoms
5	C	403	9UE	C18-C10-N2-C11
5	E	403	9UE	C18-C10-N2-C11
3	A	401	ADP	O4'-C4'-C5'-O5'
3	A	401	ADP	C3'-C4'-C5'-O5'
3	B	401	ADP	O4'-C4'-C5'-O5'
3	B	401	ADP	C3'-C4'-C5'-O5'
3	D	401	ADP	O4'-C4'-C5'-O5'
3	D	401	ADP	C3'-C4'-C5'-O5'
3	E	401	ADP	O4'-C4'-C5'-O5'
3	E	401	ADP	C3'-C4'-C5'-O5'
5	A	403	9UE	C18-C10-C9-N1
5	C	403	9UE	C18-C10-C9-N1
5	E	403	9UE	C18-C10-C9-N1
5	A	403	9UE	N2-C10-C9-N1
5	C	403	9UE	N2-C10-C9-N1
5	E	403	9UE	N2-C10-C9-N1
5	A	403	9UE	C20-C8-N1-C9
5	C	403	9UE	C20-C8-N1-C9
5	E	403	9UE	C20-C8-N1-C9
5	A	403	9UE	C5-C4-O-C3
5	C	403	9UE	C5-C4-O-C3
5	E	403	9UE	C5-C4-O-C3
5	A	403	9UE	O1-C4-O-C3
5	C	403	9UE	O1-C4-O-C3
5	E	403	9UE	O1-C4-O-C3
3	C	401	ADP	O4'-C4'-C5'-O5'
5	A	403	9UE	C18-C10-C9-O3
5	C	403	9UE	C18-C10-C9-O3
5	E	403	9UE	C18-C10-C9-O3
5	A	403	9UE	N2-C10-C9-O3
5	C	403	9UE	N2-C10-C9-O3
5	E	403	9UE	N2-C10-C9-O3
5	A	403	9UE	C-C1-C15-C14
5	C	403	9UE	C-C1-C15-C14
5	E	403	9UE	C-C1-C15-C14
5	A	403	9UE	C30-C29-C6-N
5	C	403	9UE	C30-C29-C6-N
5	A	403	9UE	C4-C5-C6-N
5	C	403	9UE	C4-C5-C6-N
5	E	403	9UE	C4-C5-C6-N
3	A	401	ADP	C5'-O5'-PA-O3A
5	E	403	9UE	C30-C29-C6-N

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Mol	Chain	Res	Type	Atoms
3	D	401	ADP	PB-O3A-PA-O1A
3	E	401	ADP	PB-O3A-PA-O1A
3	E	401	ADP	C5'-O5'-PA-O1A
5	A	403	9UE	C15-C1-C2-C3
5	C	403	9UE	C15-C1-C2-C3
5	E	403	9UE	C15-C1-C2-C3
5	A	403	9UE	C20-C8-N1-C19
5	C	403	9UE	C20-C8-N1-C19
5	E	403	9UE	C20-C8-N1-C19
5	A	403	9UE	O1-C4-C5-C6
5	C	403	9UE	O1-C4-C5-C6
5	E	403	9UE	O1-C4-C5-C6
5	A	403	9UE	C34-C29-C6-N
5	C	403	9UE	C34-C29-C6-N
5	E	403	9UE	C34-C29-C6-N
5	C	403	9UE	O-C4-C5-C6
5	A	403	9UE	O-C4-C5-C6
5	E	403	9UE	O-C4-C5-C6
3	A	401	ADP	PB-O3A-PA-O1A
3	B	401	ADP	C5'-O5'-PA-O3A
3	C	401	ADP	C5'-O5'-PA-O3A
3	D	401	ADP	C5'-O5'-PA-O3A
3	B	401	ADP	PB-O3A-PA-O1A
3	C	401	ADP	C5'-O5'-PA-O2A

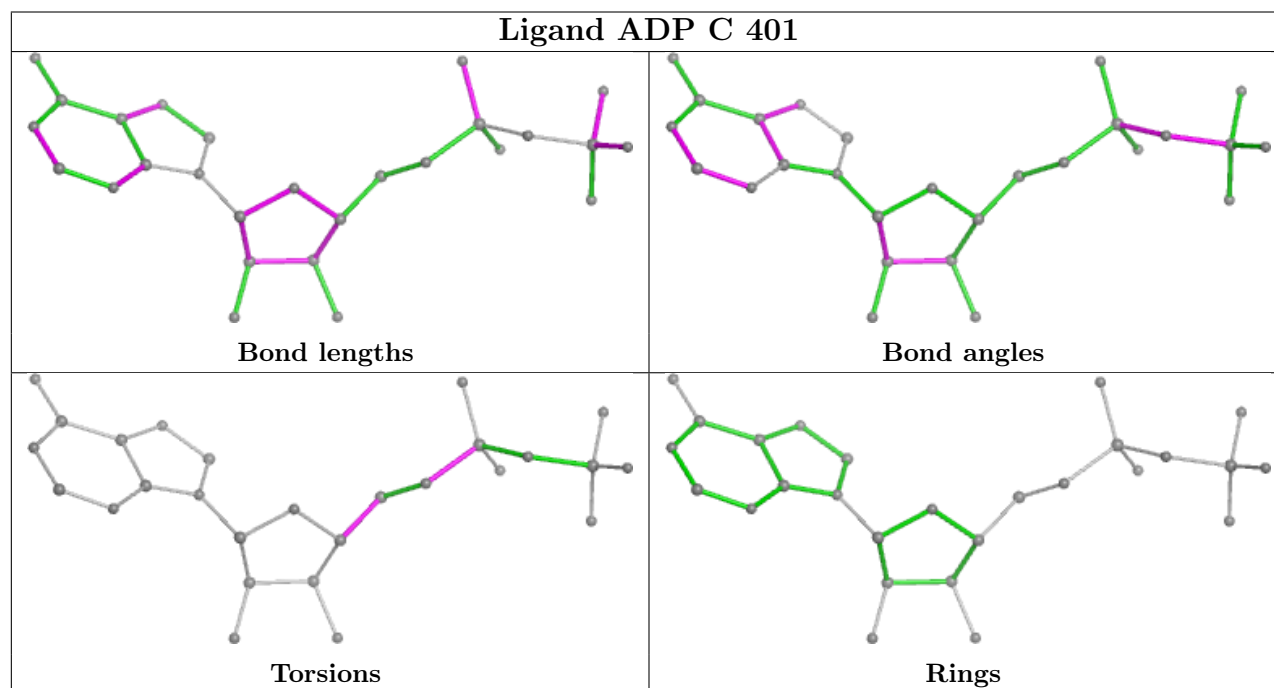
There are no ring outliers.

8 monomers are involved in 34 short contacts:

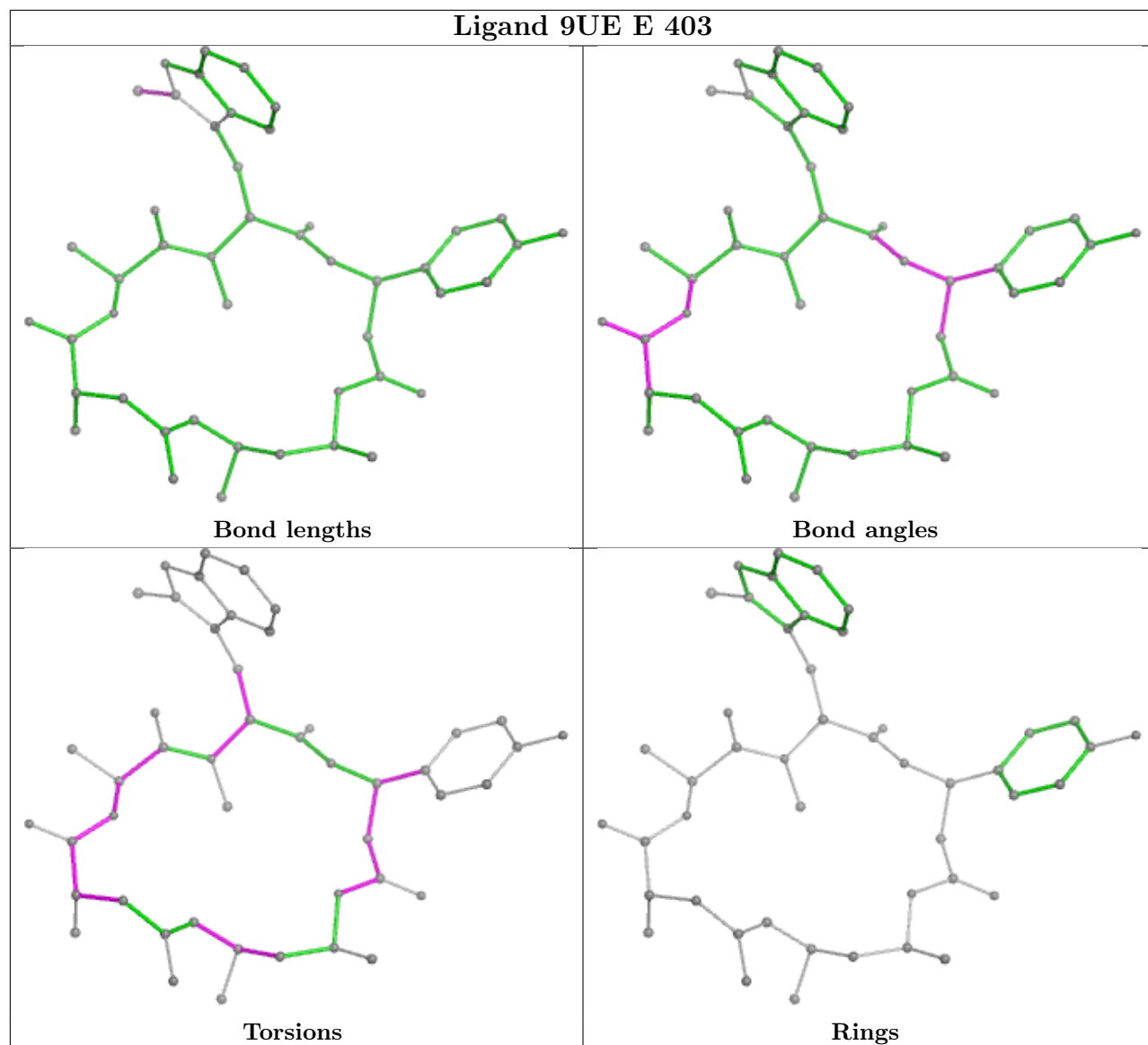
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	C	401	ADP	1	0
5	E	403	9UE	8	0
3	A	401	ADP	2	0
5	A	403	9UE	4	0
3	E	401	ADP	2	0
3	B	401	ADP	5	0
3	D	401	ADP	4	0
5	C	403	9UE	8	0

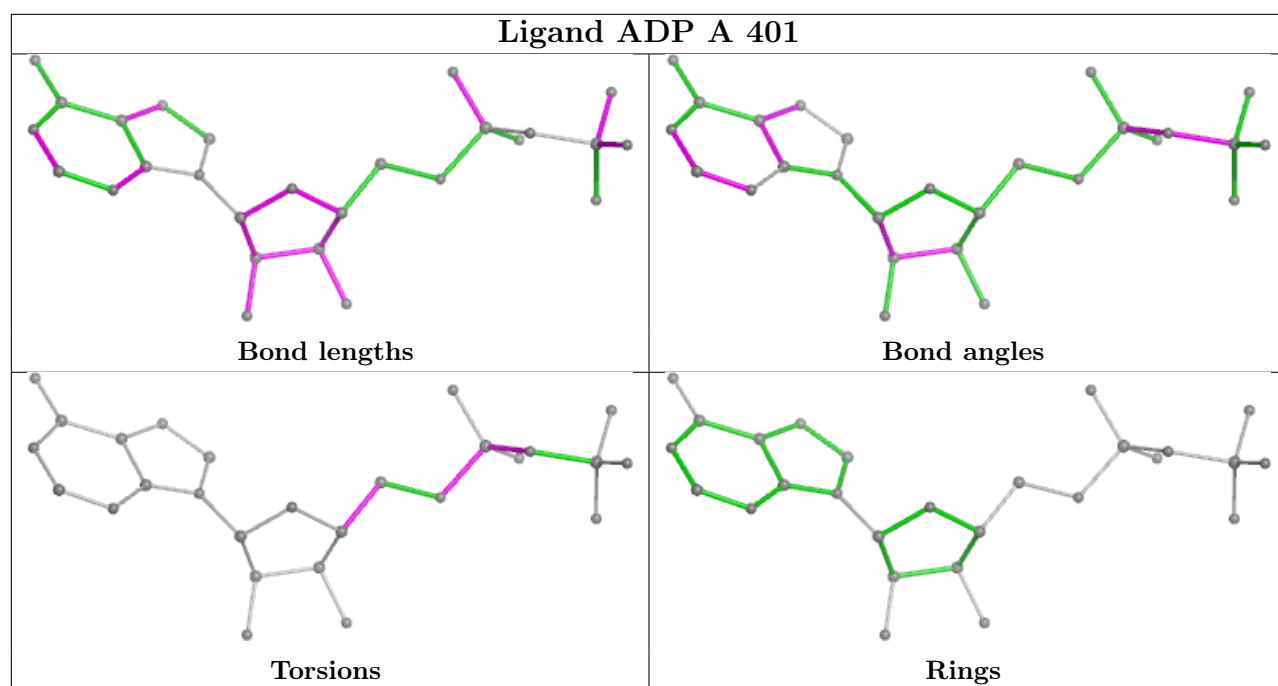
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. 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.

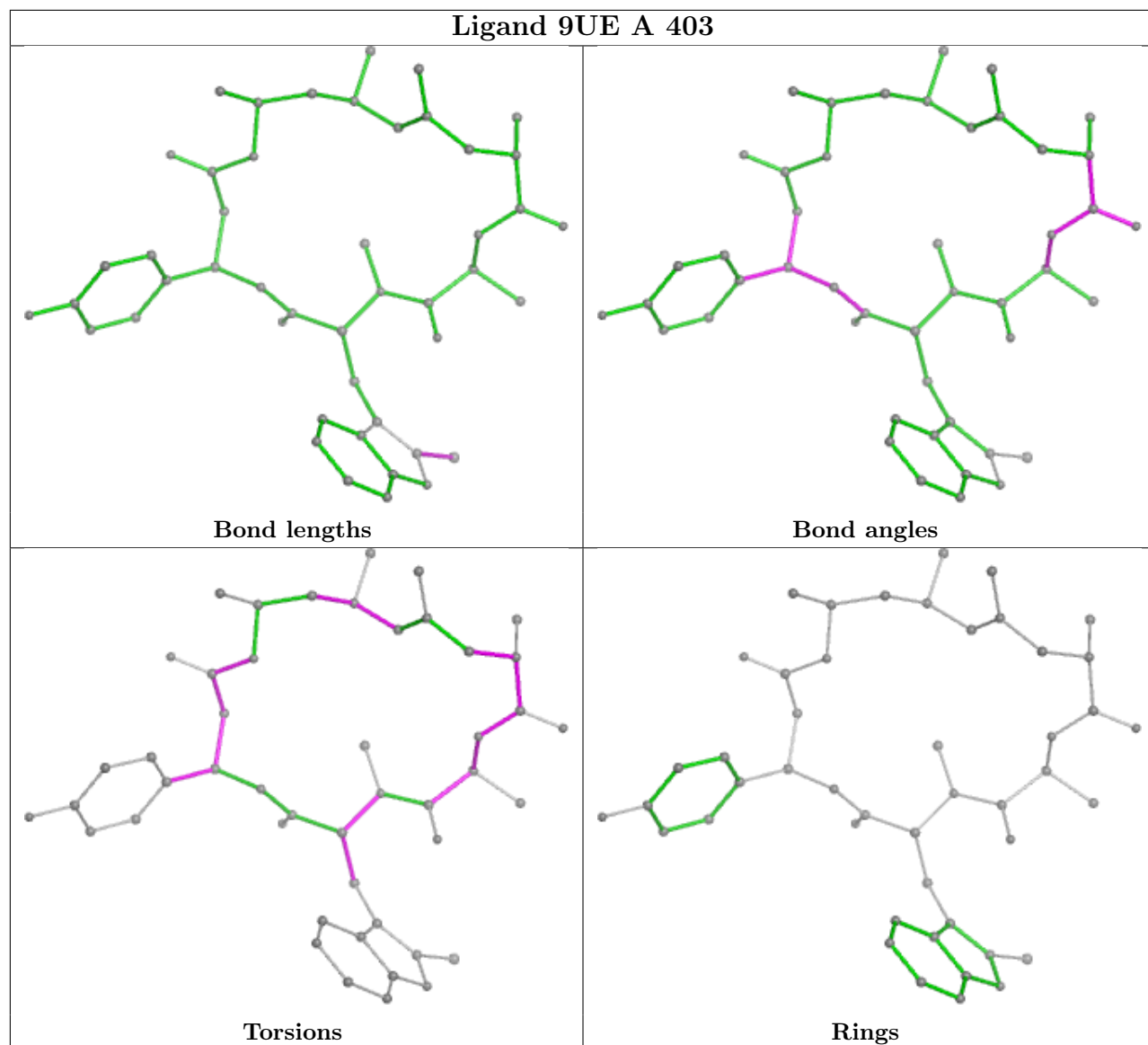


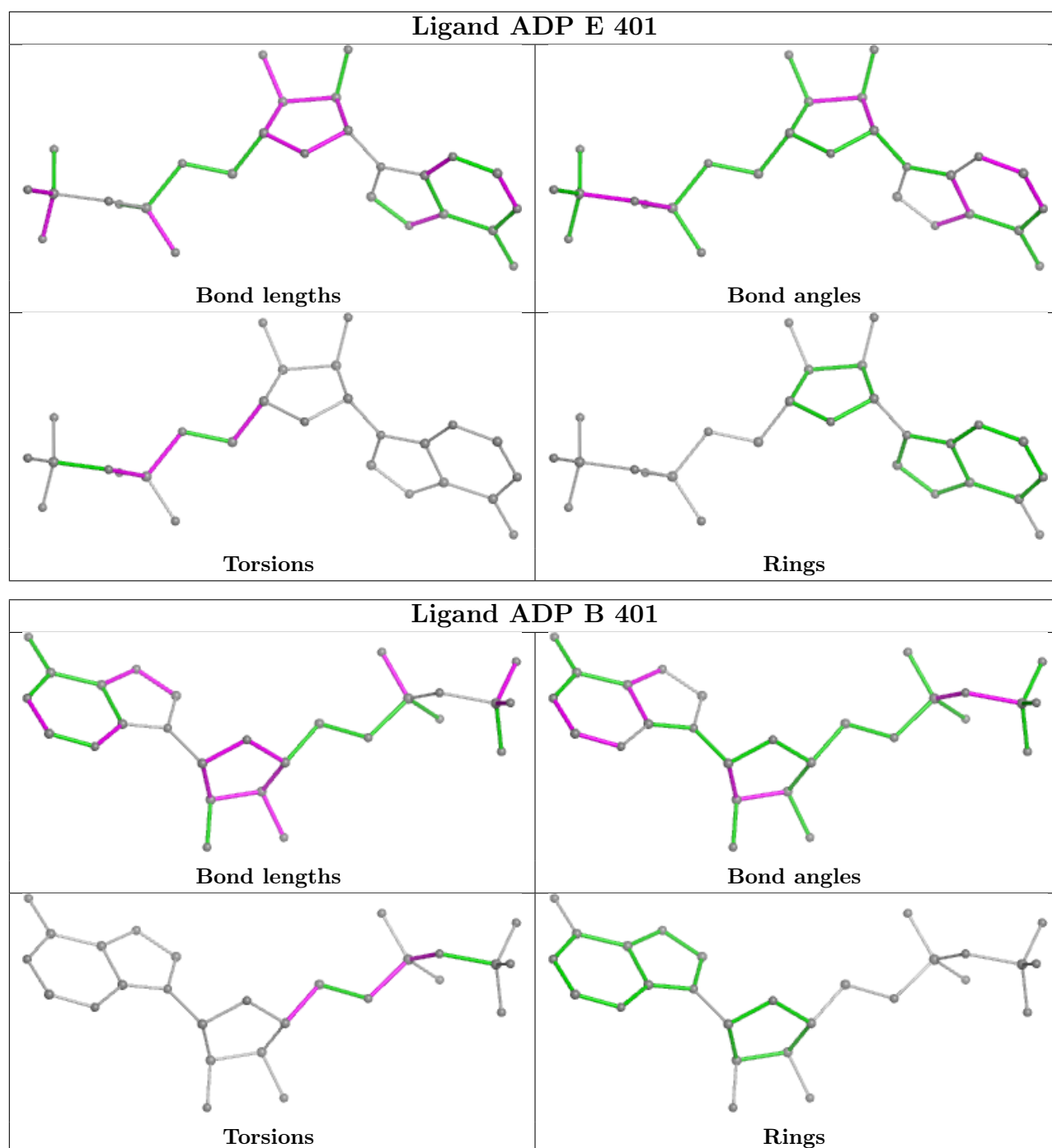
Ligand 9UE E 403

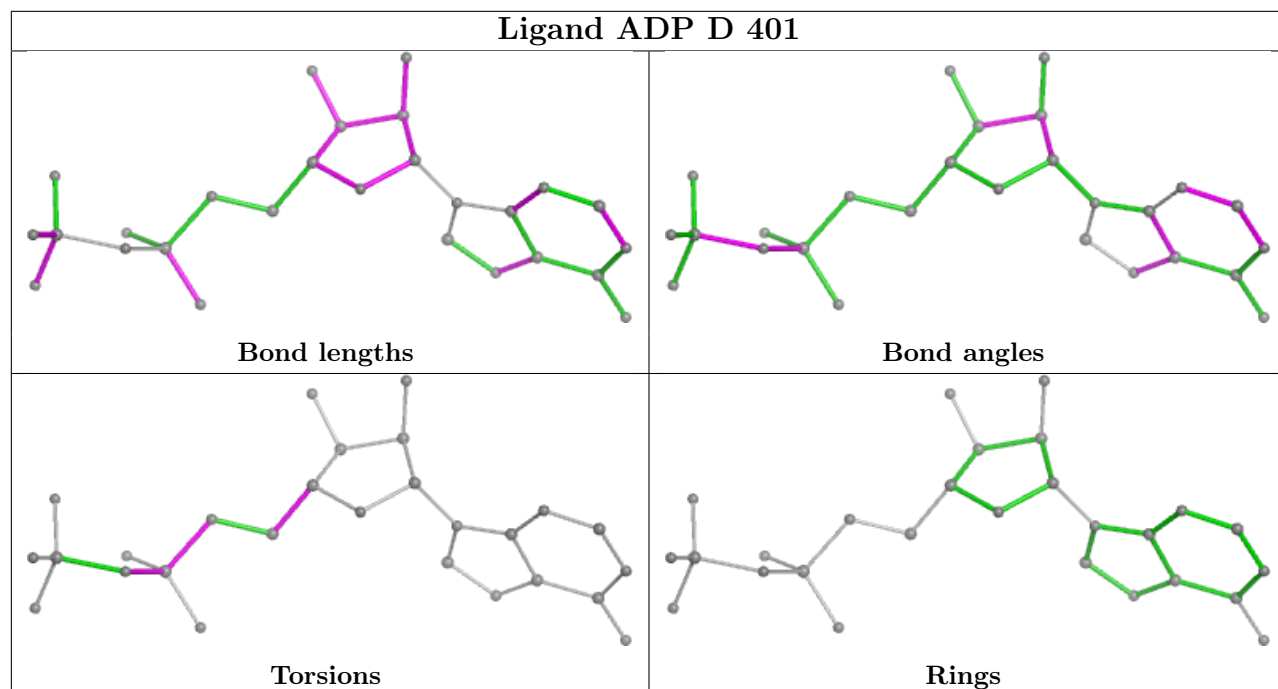


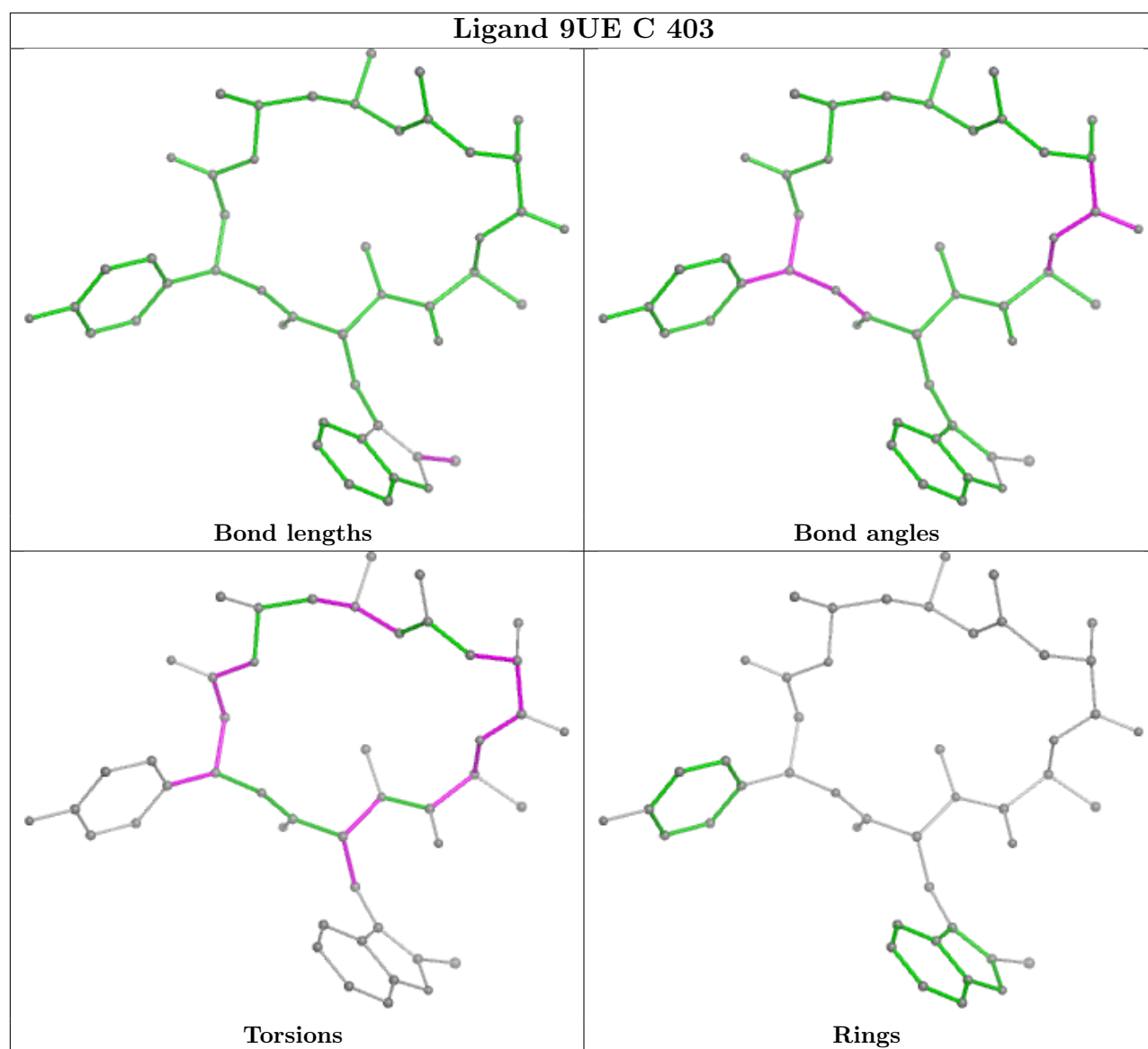


Ligand 9UE A 403









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.

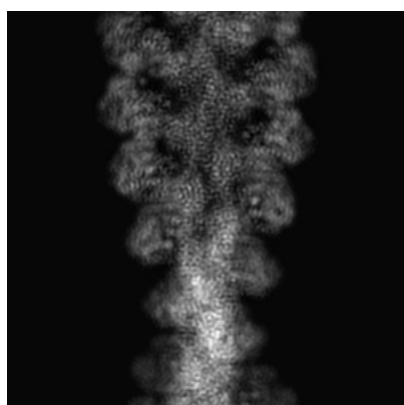
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-11818. These allow visual inspection of the internal detail of the map and identification of artifacts.

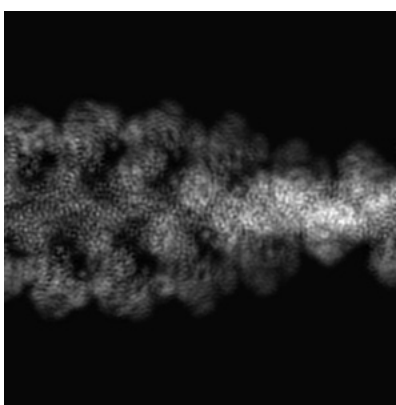
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

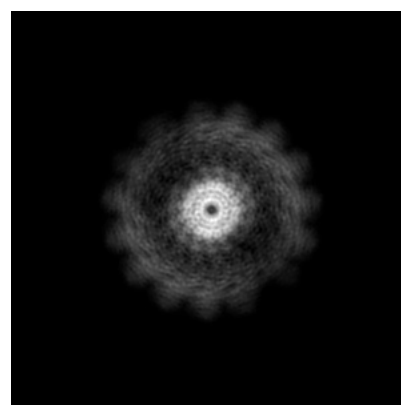
6.1.1 Primary map



X



Y



Z

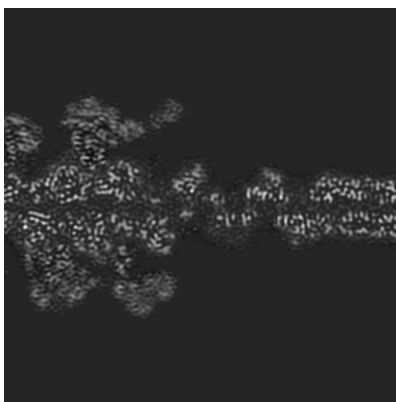
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

6.2.1 Primary map



X Index: 168



Y Index: 168

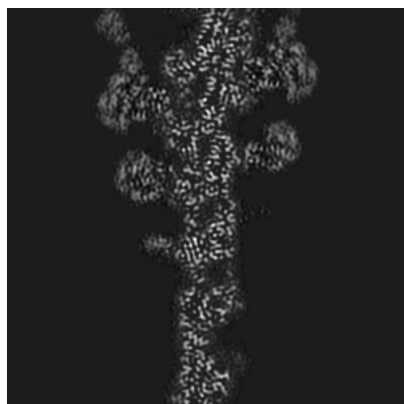


Z Index: 168

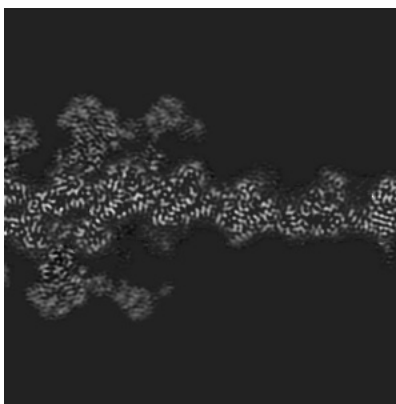
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

6.3.1 Primary map



X Index: 160



Y Index: 176

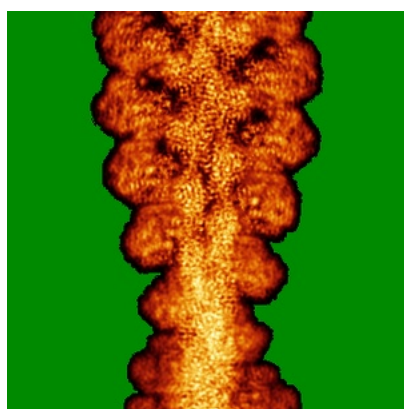


Z Index: 30

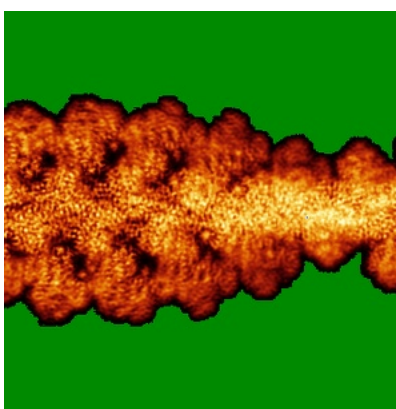
The images above show the largest variance slices of the map in three orthogonal directions.

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

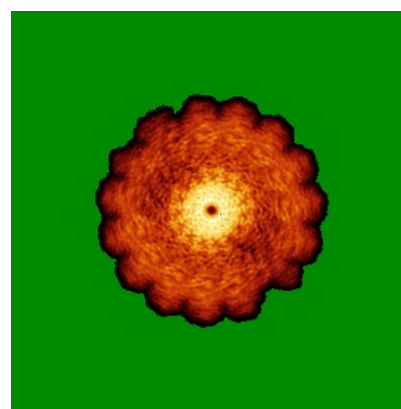
6.4.1 Primary map



X



Y

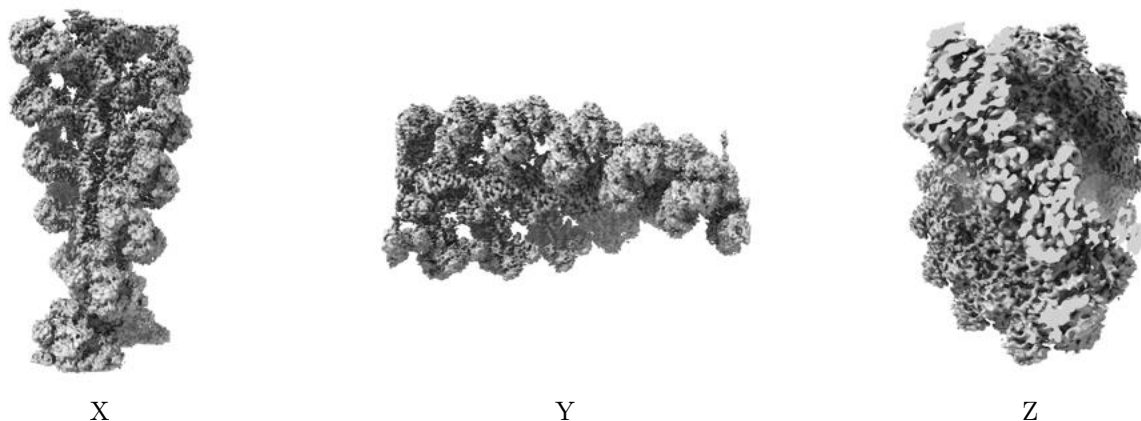


Z

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 4.0. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

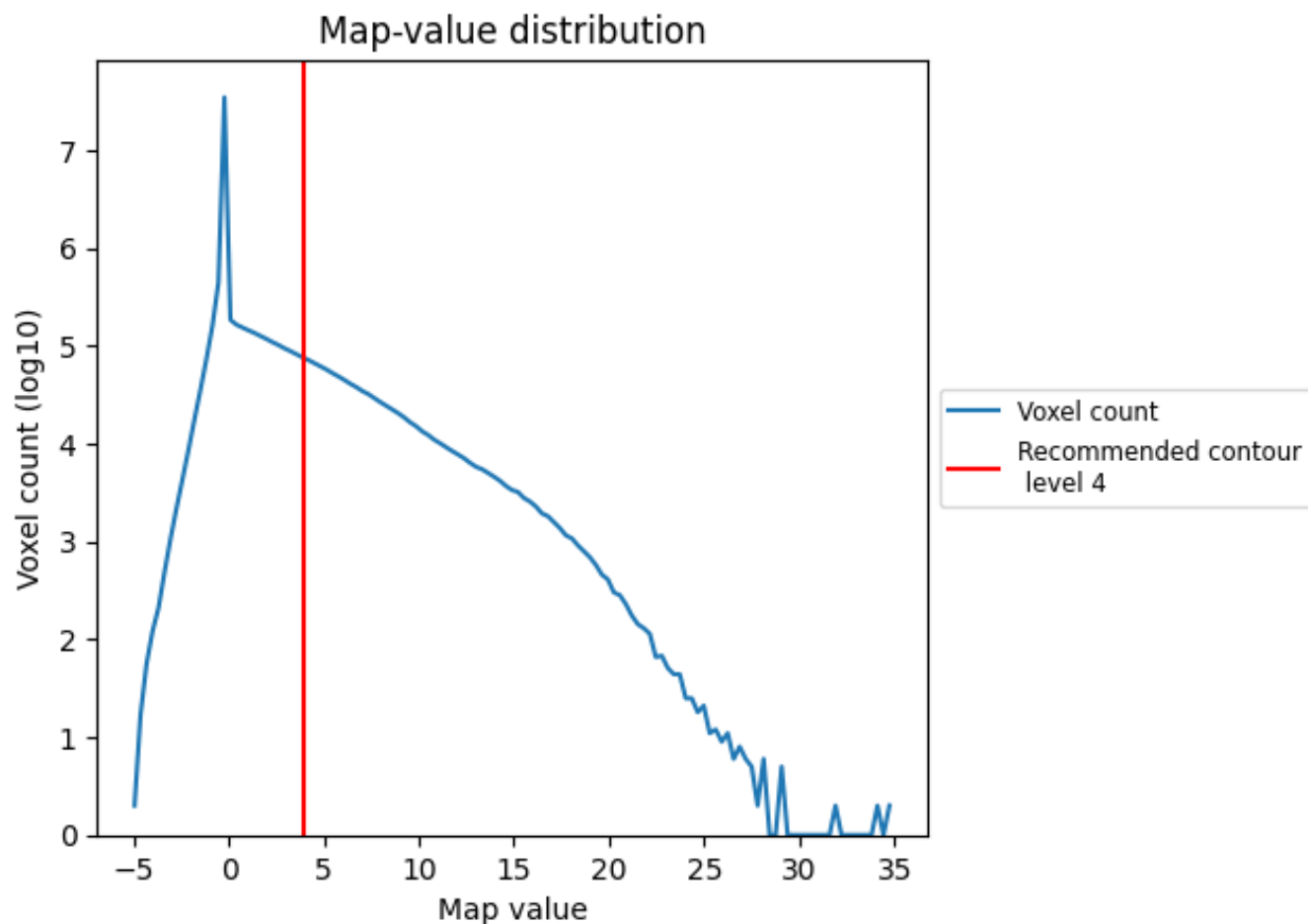
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

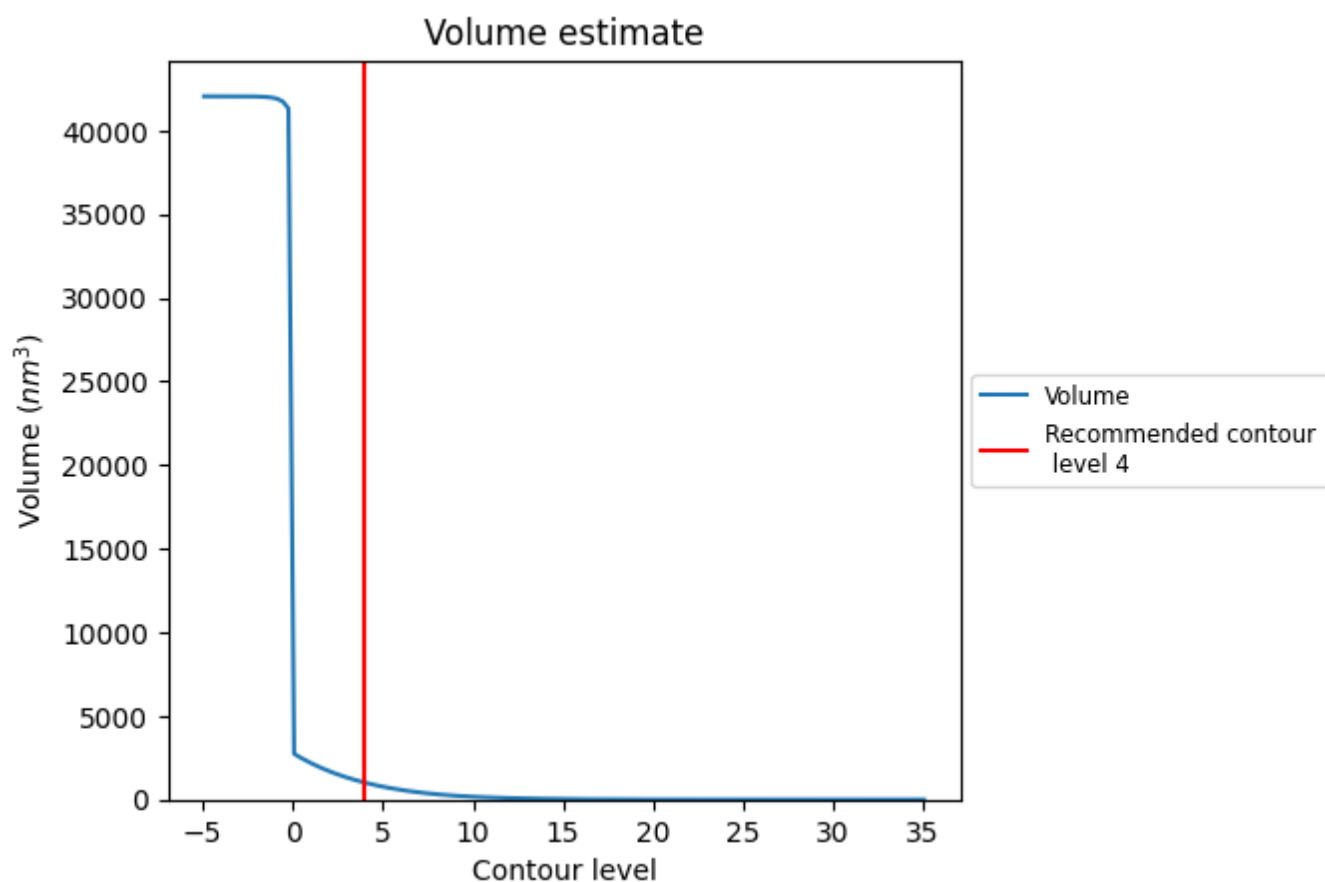
This section contains the results of statistical analysis of the map.

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.

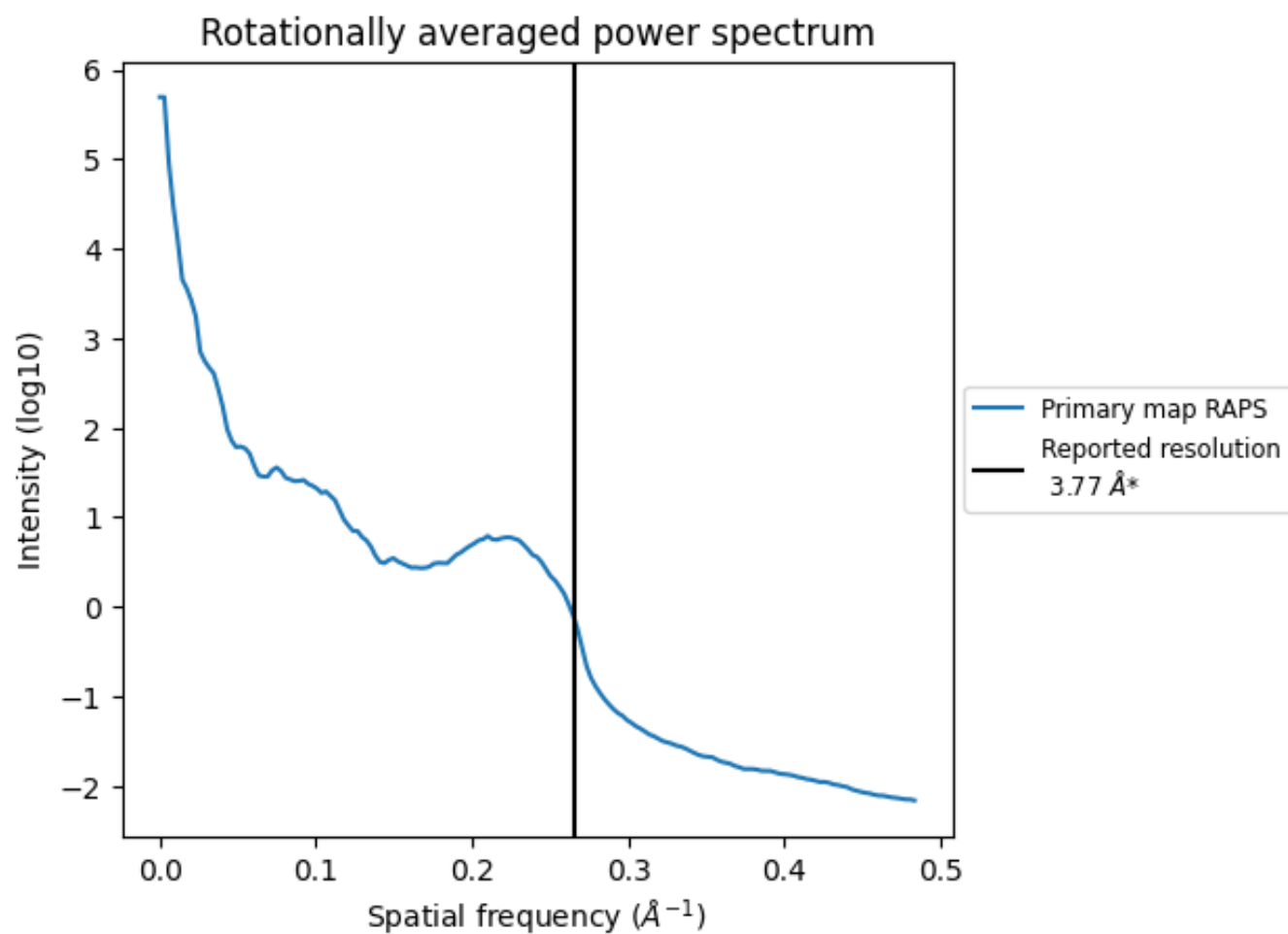
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 1014 nm³; this corresponds to an approximate mass of 916 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 0.265 Å⁻¹

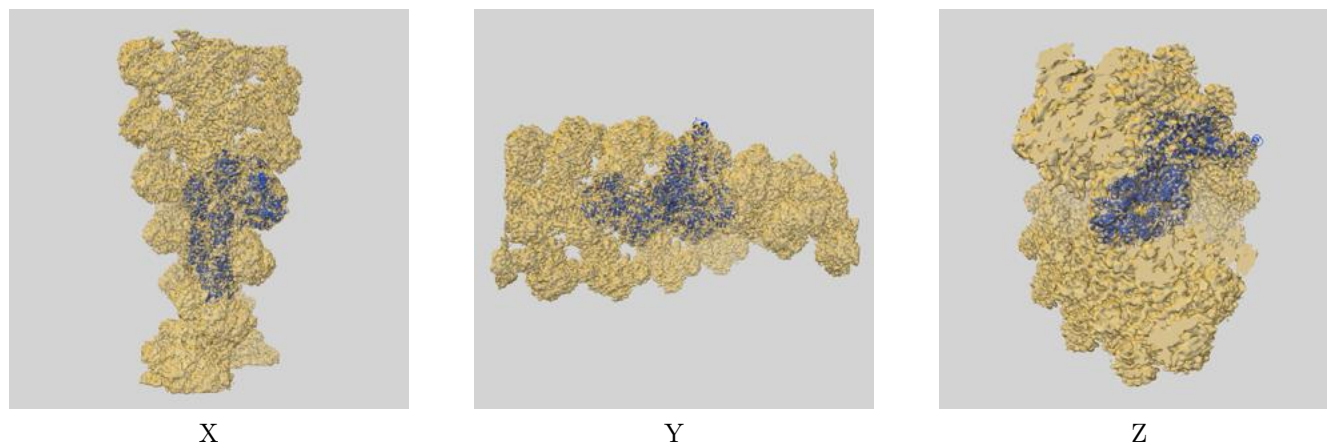
8 Fourier-Shell correlation

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

9 Map-model fit [i](#)

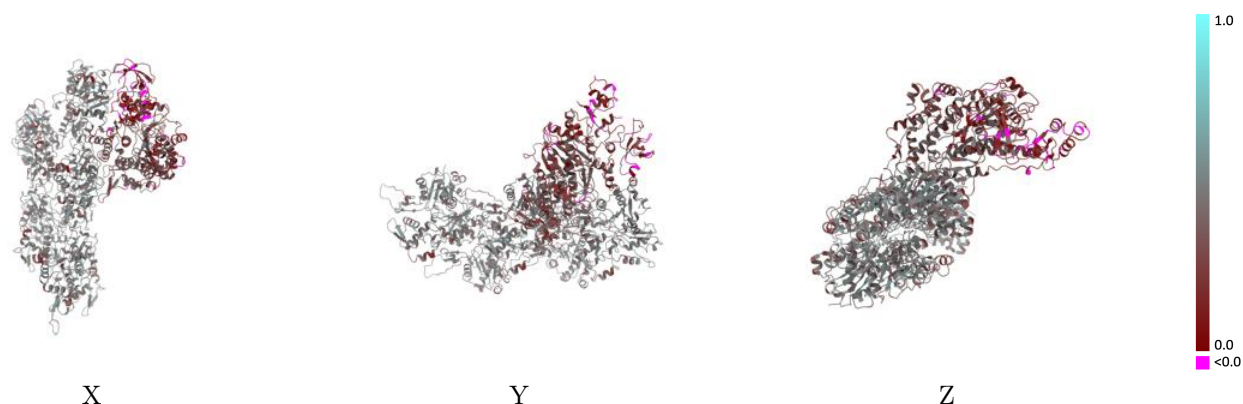
This section contains information regarding the fit between EMDB map EMD-11818 and PDB model 7ALN. Per-residue inclusion information can be found in section [3](#) on page [7](#).

9.1 Map-model overlay [i](#)



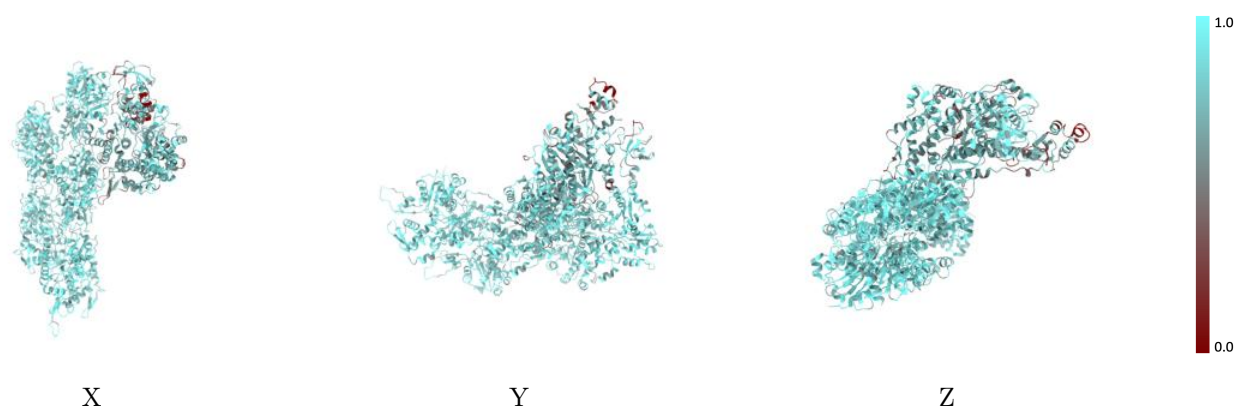
The images above show the 3D surface view of the map at the recommended contour level 4.0 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



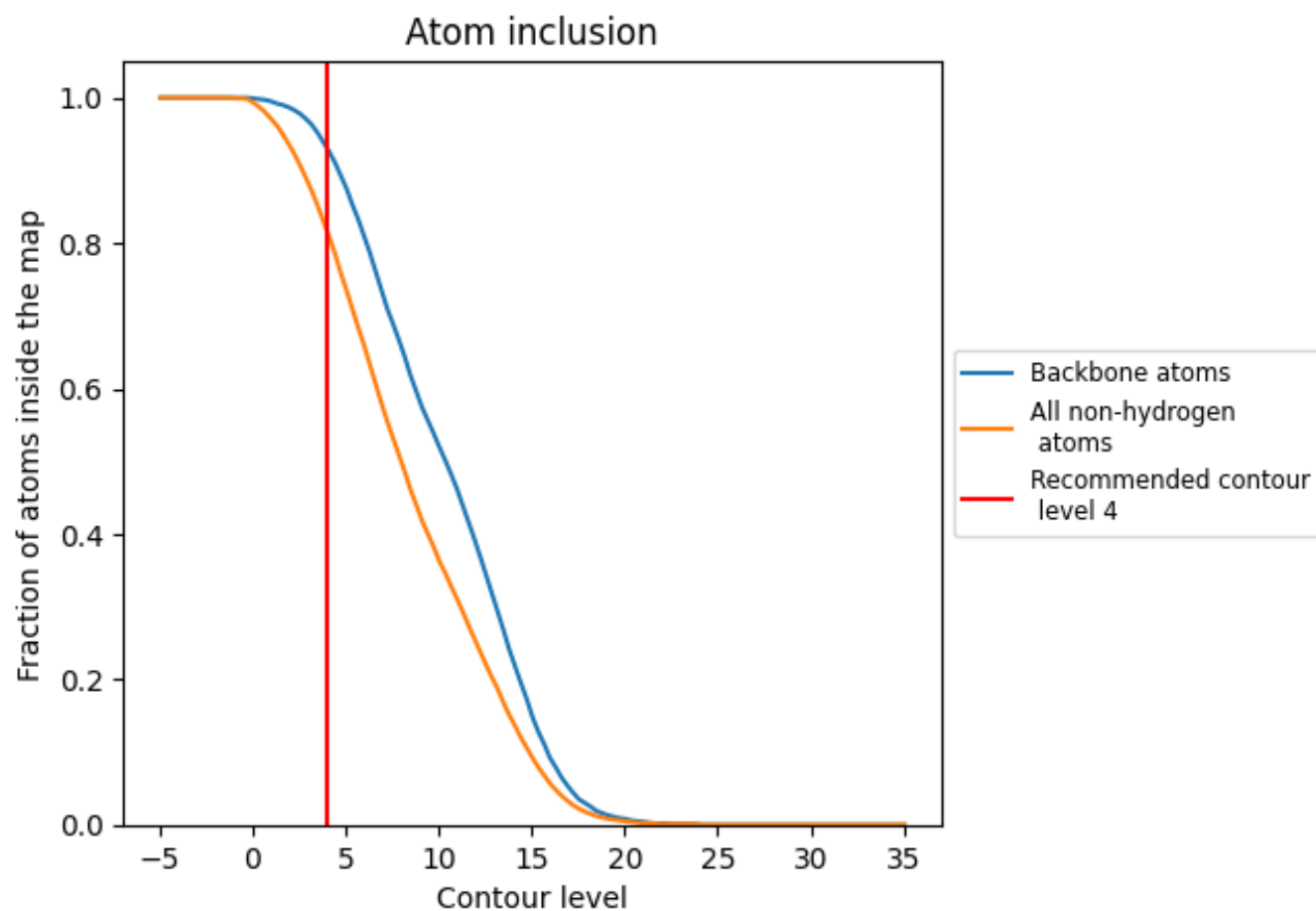
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (4).

9.4 Atom inclusion [i](#)



At the recommended contour level, 93% of all backbone atoms, 82% 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 (4) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	<div><div></div>0.8180</div>	<div><div></div>0.4020</div>
A	<div><div></div>0.8720</div>	<div><div></div>0.4590</div>
B	<div><div></div>0.8690</div>	<div><div></div>0.4570</div>
C	<div><div></div>0.8660</div>	<div><div></div>0.4560</div>
D	<div><div></div>0.8670</div>	<div><div></div>0.4560</div>
E	<div><div></div>0.8700</div>	<div><div></div>0.4560</div>
F	<div><div></div>0.6960</div>	<div><div></div>0.2690</div>

