



Full wwPDB EM Validation Report ⓘ

Dec 16, 2025 – 12:14 PM JST

PDB ID : 9L0S / pdb_00009l0s
EMDB ID : EMD-62722
Title : Cryo-EM structure of human lipid phosphate phosphatase 1 complexed with VO4
Authors : Yang, M.; Qian, H.W.
Deposited on : 2024-12-12
Resolution : 2.47 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.dev129
Mogul : 1.8.5 (274361), 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) : 2.47

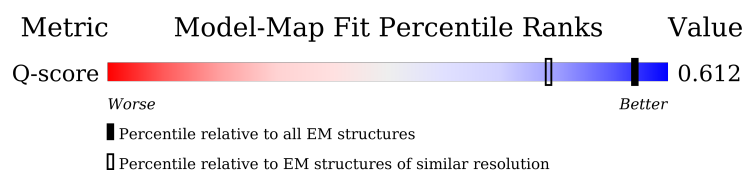
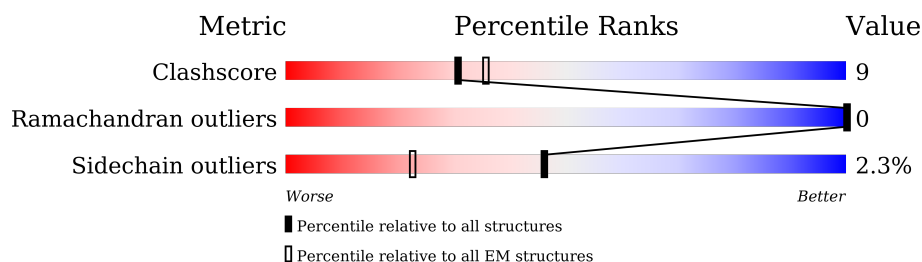
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 2.47 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	6086 (1.98 - 2.97)

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	284	8% 67% 22% 11%
1	B	284	8% 70% 18% 11%
1	C	284	8% 69% 20% 11%
1	D	284	8% 71% 17% • 11%

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
5	VO4	A	305	-	-	X	-
5	VO4	B	305	-	-	X	-
5	VO4	C	305	-	-	X	-
5	VO4	D	304	-	-	X	-

2 Entry composition [i](#)

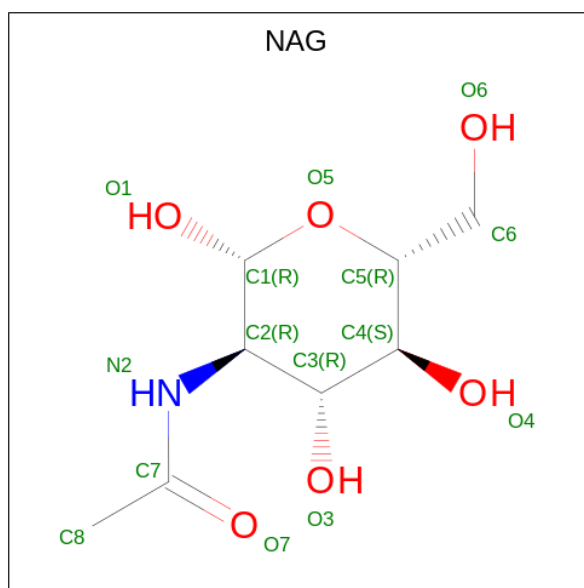
There are 7 unique types of molecules in this entry. The entry contains 8744 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Phospholipid phosphatase 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	D	252	Total	C	N	O	S	0	0
			2008	1315	331	352	10		
1	A	252	Total	C	N	O	S	0	0
			2008	1315	331	352	10		
1	B	252	Total	C	N	O	S	0	0
			2008	1315	331	352	10		
1	C	252	Total	C	N	O	S	0	0
			2008	1315	331	352	10		

- Molecule 2 is 2-acetamido-2-deoxy-beta-D-glucopyranose (CCD ID: NAG) (formula: C₈H₁₅NO₆) (labeled as "Ligand of Interest" by depositor).



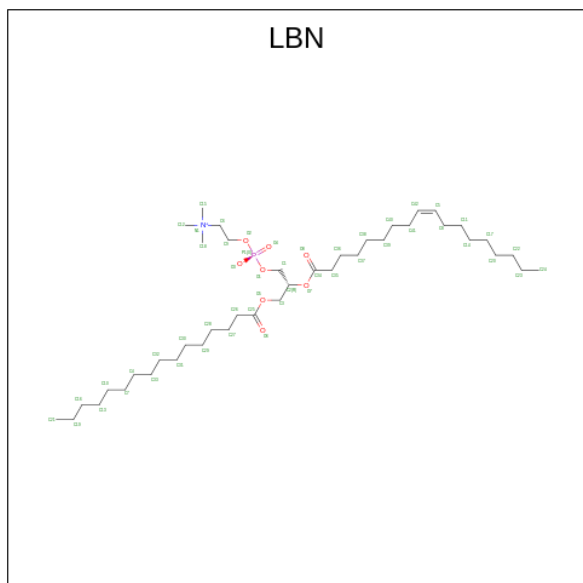
Mol	Chain	Residues	Atoms				AltConf
2	D	1	Total	C	N	O	0
			14	8	1	5	
2	A	1	Total	C	N	O	0
			14	8	1	5	

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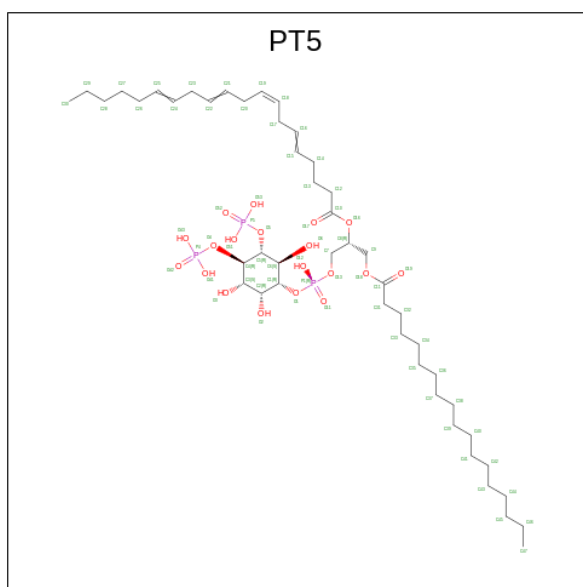
Mol	Chain	Residues	Atoms				AltConf
2	B	1	Total	C	N	O	0
			14	8	1	5	
2	C	1	Total	C	N	O	0
			14	8	1	5	

- Molecule 3 is 1-palmitoyl-2-oleoyl-sn-glycero-3-phosphocholine (CCD ID: LBN) (formula: $C_{42}H_{82}NO_8P$) (labeled as "Ligand of Interest" by depositor).



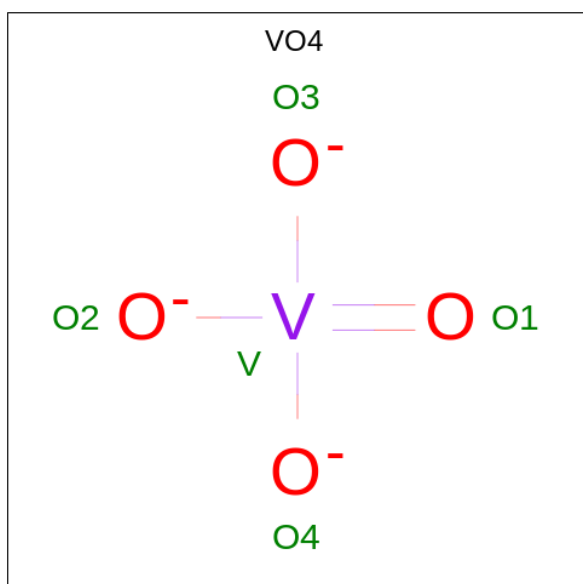
Mol	Chain	Residues	Atoms				AltConf
3	D	1	Total	C	O	P	0
			45	36	8	1	
3	A	1	Total	C	O	P	0
			45	36	8	1	
3	B	1	Total	C	O	P	0
			45	36	8	1	
3	C	1	Total	C	O	P	0
			45	36	8	1	

- Molecule 4 is [(2R)-1-octadecanoyloxy-3-[oxidanyl-[(1R,2R,3S,4R,5R,6S)-2,3,6-tris(oxidanyl)-4,5-diphosphonooxy-cyclohexyl]oxy-phosphoryl]oxy-propan-2-yl] (8Z)-icosa-5,8,11,14-tetraenoate (CCD ID: PT5) (formula: $C_{47}H_{85}O_{19}P_3$) (labeled as "Ligand of Interest" by depositor).



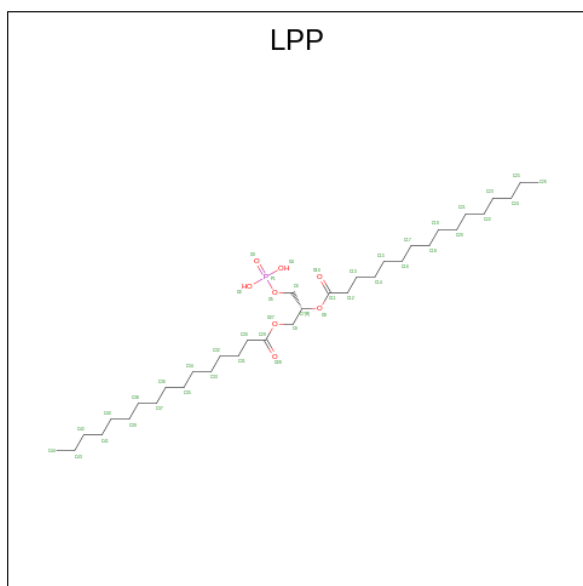
Mol	Chain	Residues	Atoms				AltConf
4	D	1	Total	C	O	P	0
			62	40	19	3	
4	A	1	Total	C	O	P	0
			62	40	19	3	
4	B	1	Total	C	O	P	0
			62	40	19	3	
4	C	1	Total	C	O	P	0
			62	40	19	3	

- Molecule 5 is VANADATE ION (CCD ID: VO4) (formula: O_4V) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms			AltConf
5	D	1	Total	O	V	0
			5	4	1	
5	A	1	Total	O	V	0
			5	4	1	
5	B	1	Total	O	V	0
			5	4	1	
5	C	1	Total	O	V	0
			5	4	1	

- Molecule 6 is 2-(HEXADECANOYLOXY)-1-[(PHOSPHONOOXY)METHYL]ETHYL HEXADECANOATE (CCD ID: LPP) (formula: $C_{35}H_{69}O_8P$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				AltConf
6	D	1	Total	C	O	P	0
			44	35	8	1	
6	A	1	Total	C	O	P	0
			44	35	8	1	
6	B	1	Total	C	O	P	0
			44	35	8	1	
6	C	1	Total	C	O	P	0
			44	35	8	1	

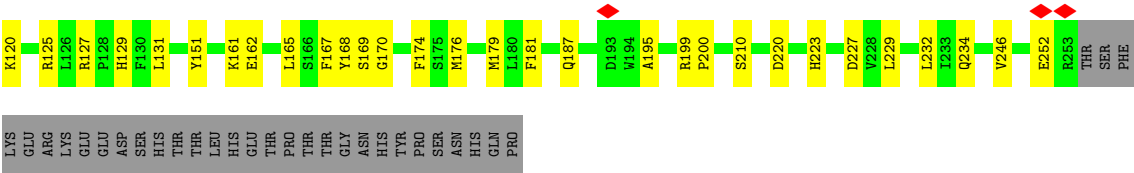
- Molecule 7 is water.

Mol	Chain	Residues	Atoms		AltConf
7	D	8	Total	O	0
			8	8	

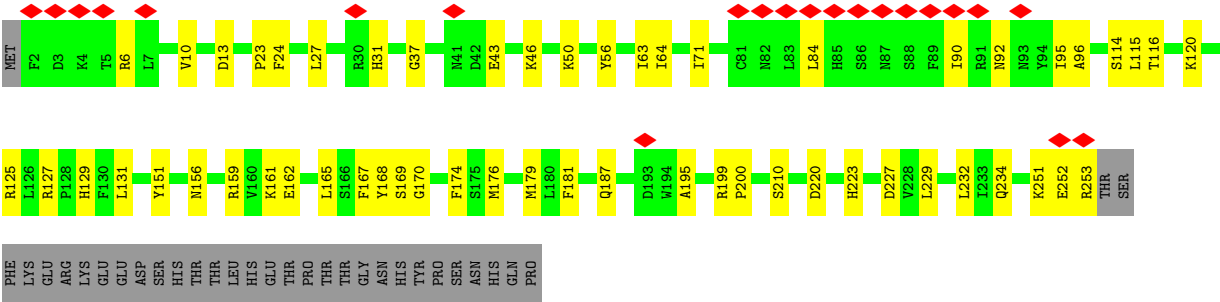
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Mol	Chain	Residues	Atoms		AltConf
7	A	8	Total 8	O 8	0
7	B	8	Total 8	O 8	0
7	C	8	Total 8	O 8	0



● Molecule 1: Phospholipid phosphatase 1



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	636414	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 ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	1500	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.963	Depositor
Minimum map value	-0.477	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.023	Depositor
Recommended contour level	0.108	Depositor
Map size (Å)	209.92, 209.92, 209.92	wwPDB
Map dimensions	256, 256, 256	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.82, 0.82, 0.82	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: LBN, NAG, VO4, LPP, PT5

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	0.18	0/2060	0.41	0/2797
1	B	0.16	0/2060	0.40	0/2797
1	C	0.16	0/2060	0.40	0/2797
1	D	0.15	0/2060	0.37	0/2797
All	All	0.16	0/8240	0.39	0/11188

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	A	2008	0	2017	43	0
1	B	2008	0	2017	34	0
1	C	2008	0	2017	36	0
1	D	2008	0	2017	35	0
2	A	14	0	13	0	0
2	B	14	0	13	0	0
2	C	14	0	13	0	0
2	D	14	0	13	0	0
3	A	45	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	B	45	0	0	0	0
3	C	45	0	0	0	0
3	D	45	0	0	0	0
4	A	62	0	65	3	0
4	B	62	0	65	5	0
4	C	62	0	65	7	0
4	D	62	0	65	5	0
5	A	5	0	0	2	0
5	B	5	0	0	2	0
5	C	5	0	0	2	0
5	D	5	0	0	3	0
6	A	44	0	67	4	0
6	B	44	0	67	2	0
6	C	44	0	67	2	0
6	D	44	0	67	2	0
7	A	8	0	0	2	0
7	B	8	0	0	1	0
7	C	8	0	0	1	0
7	D	8	0	0	0	0
All	All	8744	0	8648	151	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 (151) 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:A:223:HIS:CE1	5:A:305:VO4:O4	2.39	0.76
1:A:161:LYS:NZ	7:A:401:HOH:O	2.11	0.74
1:D:223:HIS:CE1	5:D:304:VO4:O4	2.41	0.73
1:C:223:HIS:CE1	5:C:305:VO4:O4	2.41	0.73
1:B:223:HIS:CE1	5:B:305:VO4:O4	2.41	0.72
1:A:127:ARG:NH1	1:A:162:GLU:O	2.29	0.65
1:D:127:ARG:NH1	1:D:162:GLU:O	2.28	0.65
1:A:127:ARG:NH2	5:A:305:VO4:O3	2.31	0.64
1:B:127:ARG:NH1	1:B:162:GLU:O	2.29	0.63
1:C:127:ARG:NH2	5:C:305:VO4:O3	2.32	0.62
1:A:52:ASP:OD1	1:A:217:ARG:NH1	2.26	0.61
1:B:127:ARG:NH2	5:B:305:VO4:O3	2.33	0.61
1:D:127:ARG:NH2	5:D:304:VO4:O3	2.32	0.60
1:A:46:LYS:HG2	1:A:131:LEU:HD12	1.84	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:127:ARG:NH1	1:C:162:GLU:O	2.29	0.60
1:A:120:LYS:NZ	1:A:168:TYR:O	2.34	0.59
1:A:187:GLN:HA	1:A:199:ARG:HD2	1.85	0.59
1:C:46:LYS:HG2	1:C:131:LEU:HD12	1.85	0.58
4:D:303:PT5:H52	1:A:196:ARG:HD3	1.84	0.58
1:B:46:LYS:HG2	1:B:131:LEU:HD12	1.85	0.58
1:A:125:ARG:NH1	1:A:227:ASP:OD1	2.37	0.58
1:A:6:ARG:NH1	4:A:304:PT5:O11	2.37	0.57
1:D:196:ARG:HG3	4:C:304:PT5:H52	1.88	0.56
1:A:120:LYS:HB3	1:A:165:LEU:HD22	1.88	0.56
1:B:6:ARG:NH1	4:B:304:PT5:O11	2.39	0.56
1:B:120:LYS:NZ	1:B:168:TYR:O	2.39	0.56
1:C:120:LYS:NZ	1:C:168:TYR:O	2.39	0.55
1:A:176:MET:HE2	1:A:232:LEU:HD22	1.88	0.54
1:C:6:ARG:NH1	4:C:304:PT5:O11	2.41	0.54
1:D:125:ARG:NH1	1:D:227:ASP:OD1	2.41	0.54
1:C:120:LYS:HB3	1:C:165:LEU:HD22	1.90	0.54
6:D:305:LPP:H411	6:D:305:LPP:H261	1.89	0.54
1:D:54:ILE:HD13	1:D:213:VAL:HG22	1.90	0.54
6:A:301:LPP:H411	6:A:301:LPP:H261	1.90	0.54
1:A:24:PHE:HB3	1:A:114:SER:HA	1.90	0.53
6:C:301:LPP:H411	6:C:301:LPP:H261	1.90	0.53
1:D:53:THR:HG22	1:D:54:ILE:HG13	1.90	0.53
1:A:71:ILE:HD11	1:A:181:PHE:HE2	1.74	0.53
1:D:6:ARG:NH1	4:D:303:PT5:O11	2.41	0.53
1:B:179:MET:HG3	1:B:210:SER:HB3	1.90	0.53
1:B:120:LYS:HB3	1:B:165:LEU:HD22	1.90	0.53
6:B:301:LPP:H261	6:B:301:LPP:H411	1.90	0.52
1:B:187:GLN:HA	1:B:199:ARG:HD2	1.91	0.52
1:C:187:GLN:HA	1:C:199:ARG:HD2	1.92	0.52
1:D:120:LYS:HB3	1:D:165:LEU:HD22	1.91	0.52
1:A:13:ASP:HB3	4:A:304:PT5:H62	1.92	0.52
1:A:116:THR:HG21	1:A:170:GLY:HA2	1.92	0.51
1:D:187:GLN:HA	1:D:199:ARG:HD2	1.92	0.51
1:A:90:ILE:HG23	1:A:92:ASN:H	1.74	0.51
1:D:42:ASP:OD1	1:D:44:SER:OG	2.28	0.51
1:B:125:ARG:NH1	1:B:227:ASP:OD1	2.43	0.51
1:D:90:ILE:HG23	1:D:92:ASN:H	1.75	0.51
1:D:85:HIS:O	1:D:253:ARG:NE	2.40	0.51
1:C:125:ARG:NH1	1:C:227:ASP:OD1	2.43	0.51
1:A:27:LEU:HA	1:A:31:HIS:HB2	1.93	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:13:ASP:HB3	4:D:303:PT5:H62	1.93	0.50
1:D:179:MET:HG3	1:D:210:SER:HB3	1.94	0.50
1:D:116:THR:HG22	1:D:120:LYS:HD2	1.94	0.50
1:D:120:LYS:NZ	1:D:168:TYR:O	2.43	0.49
1:B:24:PHE:HB3	1:B:114:SER:HA	1.95	0.49
1:C:13:ASP:HB3	4:C:304:PT5:H62	1.95	0.49
1:D:46:LYS:HG2	1:D:131:LEU:HD12	1.95	0.49
1:C:179:MET:HG3	1:C:210:SER:HB3	1.95	0.49
1:B:96:ALA:HA	4:B:304:PT5:H22	1.94	0.48
1:C:90:ILE:HG23	1:C:92:ASN:H	1.78	0.48
1:B:90:ILE:HG23	1:B:92:ASN:H	1.77	0.48
1:C:37:GLY:HA2	1:C:151:TYR:HE1	1.79	0.48
1:B:116:THR:HG21	1:B:170:GLY:HA2	1.96	0.48
1:C:24:PHE:HB3	1:C:114:SER:HA	1.95	0.48
1:D:27:LEU:HA	1:D:31:HIS:HB2	1.96	0.48
1:C:27:LEU:HA	1:C:31:HIS:HB2	1.94	0.47
1:B:13:ASP:HB3	4:B:304:PT5:H62	1.95	0.47
1:B:37:GLY:HA2	1:B:151:TYR:HE1	1.79	0.47
1:B:71:ILE:HD11	1:B:181:PHE:HE2	1.78	0.47
1:C:223:HIS:HB3	1:C:227:ASP:HB2	1.96	0.47
1:A:156:ASN:HB3	1:A:159:ARG:HB2	1.97	0.47
1:B:50:LYS:HE2	1:B:220:ASP:HA	1.97	0.47
1:B:167:PHE:HA	1:B:168:TYR:HA	1.52	0.47
1:B:223:HIS:HB3	1:B:227:ASP:HB2	1.96	0.47
1:B:27:LEU:HA	1:B:31:HIS:HB2	1.96	0.47
1:C:71:ILE:HD11	1:C:181:PHE:HE2	1.79	0.47
1:D:167:PHE:HA	1:D:168:TYR:HA	1.53	0.46
1:C:116:THR:HG21	1:C:170:GLY:HA2	1.95	0.46
1:D:37:GLY:HA2	1:D:151:TYR:HE1	1.80	0.46
1:D:52:ASP:OD1	1:D:217:ARG:NH1	2.33	0.46
1:A:55:PRO:HD2	1:A:58:LEU:HD23	1.97	0.46
1:C:64:ILE:HG13	1:C:174:PHE:HZ	1.81	0.46
1:C:96:ALA:HA	4:C:304:PT5:H22	1.97	0.46
1:A:37:GLY:HA2	1:A:151:TYR:HE1	1.81	0.46
1:A:96:ALA:HA	4:A:304:PT5:H22	1.97	0.46
1:A:127:ARG:HD2	1:A:163:GLY:HA2	1.98	0.46
1:A:31:HIS:O	7:A:401:HOH:O	2.21	0.45
1:A:59:LEU:HD22	1:A:171:HIS:CD2	2.51	0.45
1:C:127:ARG:HD3	1:C:129:HIS:CE1	2.52	0.45
1:D:64:ILE:HG13	1:D:174:PHE:HZ	1.81	0.45
1:A:229:LEU:HD11	6:A:301:LPP:H241	1.99	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:246:VAL:HG13	1:B:200:PRO:HG2	1.99	0.45
1:B:127:ARG:HD3	1:B:129:HIS:CE1	2.52	0.45
1:B:229:LEU:HD11	6:B:301:LPP:H241	1.98	0.45
1:D:127:ARG:HD3	1:D:129:HIS:CE1	2.52	0.45
1:C:229:LEU:HD11	6:C:301:LPP:H241	1.98	0.45
1:B:64:ILE:HG13	1:B:174:PHE:HZ	1.82	0.44
1:A:64:ILE:HG13	1:A:174:PHE:HZ	1.82	0.44
1:C:251:LYS:HD2	1:C:253:ARG:HH11	1.83	0.44
1:D:116:THR:HG21	1:D:170:GLY:HA2	1.99	0.44
1:D:223:HIS:HB3	1:D:227:ASP:HB2	2.00	0.44
1:A:251:LYS:HD2	1:A:253:ARG:HH11	1.83	0.44
1:B:169:SER:HA	1:B:223:HIS:CE1	2.53	0.44
1:C:23:PRO:HB2	1:C:114:SER:HB3	1.99	0.44
1:C:169:SER:HA	1:C:223:HIS:CE1	2.53	0.44
1:A:70:VAL:HG11	1:A:182:VAL:HG13	2.00	0.43
1:A:127:ARG:HD3	1:A:129:HIS:CE1	2.52	0.43
1:A:218:VAL:HG11	6:A:301:LPP:H302	2.00	0.43
1:B:161:LYS:CE	7:B:402:HOH:O	2.66	0.43
1:C:50:LYS:HE2	1:C:220:ASP:HA	1.99	0.43
1:A:50:LYS:HE2	1:A:220:ASP:HA	2.01	0.43
1:D:10:VAL:HG11	4:D:303:PT5:H27	2.00	0.43
1:C:195:ALA:HB1	1:C:199:ARG:HB2	2.01	0.43
1:D:100:LYS:HA	4:D:303:PT5:H54	2.01	0.43
1:A:169:SER:HA	1:A:223:HIS:CE1	2.53	0.43
1:A:195:ALA:HB1	1:A:199:ARG:HB2	2.01	0.43
1:B:95:ILE:HG23	4:B:304:PT5:H83	2.01	0.42
1:D:120:LYS:NZ	5:D:304:VO4:O4	2.42	0.42
1:D:176:MET:HG2	1:D:232:LEU:O	2.19	0.42
1:D:195:ALA:HB1	1:D:199:ARG:HB2	2.00	0.42
1:B:176:MET:HG2	1:B:232:LEU:O	2.19	0.42
1:C:176:MET:HG2	1:C:232:LEU:O	2.20	0.42
1:C:161:LYS:CE	7:C:402:HOH:O	2.67	0.42
1:B:23:PRO:HB2	1:B:114:SER:HB3	2.01	0.42
1:D:63:ILE:HD13	1:D:179:MET:HE3	2.01	0.42
1:A:229:LEU:HD22	6:A:301:LPP:H192	2.01	0.42
1:B:195:ALA:HB1	1:B:199:ARG:HB2	2.02	0.42
1:A:43:GLU:HA	1:A:46:LYS:HG3	2.02	0.42
4:C:304:PT5:H28	4:C:304:PT5:H25	1.88	0.42
1:B:100:LYS:HA	4:B:304:PT5:H54	2.02	0.41
1:C:167:PHE:HA	1:C:168:TYR:HA	1.52	0.41
1:D:71:ILE:HD11	1:D:181:PHE:HE2	1.85	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:179:MET:HA	1:A:179:MET:HE2	2.02	0.41
1:A:223:HIS:HB3	1:A:227:ASP:HB2	2.02	0.41
1:B:246:VAL:HG13	1:C:200:PRO:HG2	2.03	0.41
1:B:43:GLU:HA	1:B:46:LYS:HG3	2.02	0.41
1:D:50:LYS:HB2	1:D:50:LYS:HE3	1.91	0.41
6:D:305:LPP:H402	6:D:305:LPP:H372	1.94	0.41
1:A:6:ARG:HA	1:A:9:TYR:HD2	1.86	0.41
1:C:43:GLU:HA	1:C:46:LYS:HG3	2.02	0.40
1:A:23:PRO:HB2	1:A:114:SER:HB3	2.02	0.40
1:A:190:MET:O	1:A:199:ARG:NH1	2.47	0.40
1:C:10:VAL:HG11	4:C:304:PT5:H27	2.04	0.40
1:D:204:PHE:HE1	1:C:115:LEU:HG	1.86	0.40
1:C:156:ASN:HB3	1:C:159:ARG:HB2	2.02	0.40
1:C:95:ILE:HG23	4:C:304:PT5:H83	2.02	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	250/284 (88%)	249 (100%)	1 (0%)	0	100	100
1	B	250/284 (88%)	248 (99%)	2 (1%)	0	100	100
1	C	250/284 (88%)	248 (99%)	2 (1%)	0	100	100
1	D	250/284 (88%)	247 (99%)	3 (1%)	0	100	100
All	All	1000/1136 (88%)	992 (99%)	8 (1%)	0	100	100

There are no Ramachandran outliers to report.

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	217/248 (88%)	213 (98%)	4 (2%)	54	76
1	B	217/248 (88%)	212 (98%)	5 (2%)	45	69
1	C	217/248 (88%)	212 (98%)	5 (2%)	45	69
1	D	217/248 (88%)	211 (97%)	6 (3%)	38	63
All	All	868/992 (88%)	848 (98%)	20 (2%)	46	69

All (20) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	D	44	SER
1	D	53	THR
1	D	56	TYR
1	D	63	ILE
1	D	234	GLN
1	D	252	GLU
1	A	63	ILE
1	A	73	LEU
1	A	84	LEU
1	A	252	GLU
1	B	56	TYR
1	B	63	ILE
1	B	84	LEU
1	B	234	GLN
1	B	252	GLU
1	C	56	TYR
1	C	63	ILE
1	C	84	LEU
1	C	234	GLN
1	C	252	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (3) such sidechains are listed below:

Mol	Chain	Res	Type
1	D	87	ASN
1	A	85	HIS
1	B	85	HIS

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](#)

20 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	NAG	C	302	1	14,14,15	0.44	0	17,19,21	0.40	0
3	LBN	C	303	-	44,44,51	1.27	7 (15%)	48,49,59	1.18	3 (6%)
4	PT5	B	304	-	62,62,69	0.88	2 (3%)	76,80,87	0.96	2 (2%)
5	VO4	D	304	1	1,4,4	4.80	1 (100%)	-		
2	NAG	D	301	1	14,14,15	0.44	0	17,19,21	0.39	0
3	LBN	D	302	-	44,44,51	1.26	7 (15%)	48,49,59	1.18	3 (6%)
3	LBN	B	303	-	44,44,51	1.26	7 (15%)	48,49,59	1.18	3 (6%)
4	PT5	C	304	-	62,62,69	0.88	2 (3%)	76,80,87	0.93	2 (2%)
4	PT5	D	303	-	62,62,69	0.88	2 (3%)	76,80,87	0.95	2 (2%)
5	VO4	B	305	1	1,4,4	4.80	1 (100%)	-		

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
5	VO4	C	305	1	1,4,4	4.81	1 (100%)	-		
4	PT5	A	304	-	62,62,69	0.88	2 (3%)	76,80,87	0.96	2 (2%)
2	NAG	A	302	1	14,14,15	0.45	0	17,19,21	0.39	0
3	LBN	A	303	-	44,44,51	1.27	7 (15%)	48,49,59	1.18	3 (6%)
6	LPP	A	301	-	43,43,43	0.91	4 (9%)	47,48,48	1.09	2 (4%)
6	LPP	C	301	-	43,43,43	0.91	4 (9%)	47,48,48	1.09	2 (4%)
6	LPP	D	305	-	43,43,43	0.91	4 (9%)	47,48,48	1.09	2 (4%)
6	LPP	B	301	-	43,43,43	0.91	4 (9%)	47,48,48	1.09	2 (4%)
2	NAG	B	302	1	14,14,15	0.44	0	17,19,21	0.40	0
5	VO4	A	305	1	1,4,4	4.80	1 (100%)	-		

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	NAG	C	302	1	-	0/6/23/26	0/1/1/1
3	LBN	C	303	-	-	20/46/46/55	-
4	PT5	C	304	-	-	15/59/83/90	0/1/1/1
2	NAG	B	302	1	-	0/6/23/26	0/1/1/1
6	LPP	B	301	-	-	18/45/45/45	-
4	PT5	B	304	-	-	18/59/83/90	0/1/1/1
4	PT5	D	303	-	-	16/59/83/90	0/1/1/1
2	NAG	D	301	1	-	2/6/23/26	0/1/1/1
3	LBN	D	302	-	-	21/46/46/55	-
6	LPP	A	301	-	-	17/45/45/45	-
6	LPP	D	305	-	-	17/45/45/45	-
3	LBN	B	303	-	-	20/46/46/55	-
6	LPP	C	301	-	-	18/45/45/45	-
4	PT5	A	304	-	-	17/59/83/90	0/1/1/1
2	NAG	A	302	1	-	0/6/23/26	0/1/1/1
3	LBN	A	303	-	-	20/46/46/55	-

All (56) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	C	305	VO4	O1-V	4.81	1.91	1.63
5	B	305	VO4	O1-V	4.80	1.91	1.63
5	A	305	VO4	O1-V	4.80	1.91	1.63
5	D	304	VO4	O1-V	4.80	1.91	1.63
4	D	303	PT5	O18-C11	4.28	1.45	1.33
4	A	304	PT5	O18-C11	4.27	1.45	1.33
4	C	304	PT5	O18-C11	4.26	1.45	1.33
4	B	304	PT5	O18-C11	4.26	1.45	1.33
4	B	304	PT5	O16-C10	4.14	1.46	1.34
4	A	304	PT5	O16-C10	4.11	1.45	1.34
4	C	304	PT5	O16-C10	4.10	1.45	1.34
4	D	303	PT5	O16-C10	4.10	1.45	1.34
3	A	303	LBN	C42-C5	3.70	1.53	1.31
3	C	303	LBN	C42-C5	3.70	1.53	1.31
3	B	303	LBN	C42-C5	3.69	1.53	1.31
3	D	302	LBN	C42-C5	3.69	1.53	1.31
3	A	303	LBN	C33-C4	-3.51	1.31	1.51
3	B	303	LBN	C33-C4	-3.50	1.31	1.51
3	C	303	LBN	C33-C4	-3.50	1.32	1.51
3	D	302	LBN	C33-C4	-3.49	1.32	1.51
3	A	303	LBN	C41-C42	-3.20	1.32	1.50
3	D	302	LBN	C41-C42	-3.20	1.32	1.50
3	C	303	LBN	C41-C42	-3.20	1.32	1.50
3	B	303	LBN	C41-C42	-3.19	1.32	1.50
6	A	301	LPP	O9-C7	-2.67	1.39	1.46
6	C	301	LPP	O9-C7	-2.66	1.39	1.46
6	D	305	LPP	O9-C7	-2.65	1.40	1.46
6	B	301	LPP	O9-C7	-2.64	1.40	1.46
3	C	303	LBN	O7-C2	-2.55	1.40	1.46
3	D	302	LBN	O7-C2	-2.54	1.40	1.46
3	A	303	LBN	O7-C2	-2.53	1.40	1.46
6	D	305	LPP	O27-C29	2.52	1.40	1.33
6	C	301	LPP	O27-C29	2.52	1.40	1.33
3	B	303	LBN	O7-C2	-2.52	1.40	1.46
6	A	301	LPP	O27-C29	2.50	1.40	1.33
6	B	301	LPP	O27-C29	2.49	1.40	1.33
3	A	303	LBN	O5-C25	2.39	1.40	1.33
3	D	302	LBN	O5-C25	2.37	1.40	1.33
3	B	303	LBN	O5-C25	2.37	1.40	1.33
3	C	303	LBN	O5-C25	2.36	1.40	1.33
3	C	303	LBN	O5-C3	-2.16	1.40	1.45
3	B	303	LBN	O5-C3	-2.16	1.40	1.45
6	B	301	LPP	O9-C11	2.15	1.40	1.34

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	A	301	LPP	O9-C11	2.15	1.40	1.34
3	A	303	LBN	O5-C3	-2.15	1.40	1.45
6	C	301	LPP	O9-C11	2.15	1.40	1.34
3	D	302	LBN	O5-C3	-2.14	1.40	1.45
3	D	302	LBN	O7-C34	2.12	1.40	1.34
3	A	303	LBN	O7-C34	2.12	1.40	1.34
6	D	305	LPP	O9-C11	2.12	1.40	1.34
3	C	303	LBN	O7-C34	2.12	1.40	1.34
6	C	301	LPP	O27-C8	-2.09	1.40	1.45
3	B	303	LBN	O7-C34	2.09	1.40	1.34
6	A	301	LPP	O27-C8	-2.07	1.40	1.45
6	D	305	LPP	O27-C8	-2.06	1.40	1.45
6	B	301	LPP	O27-C8	-2.03	1.40	1.45

All (28) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	303	LBN	O7-C34-C35	4.03	120.18	111.50
3	A	303	LBN	O7-C34-C35	4.02	120.17	111.50
3	D	302	LBN	O7-C34-C35	4.01	120.14	111.50
3	B	303	LBN	O7-C34-C35	4.00	120.12	111.50
6	C	301	LPP	O9-C11-C12	3.85	119.80	111.50
6	D	305	LPP	O9-C11-C12	3.85	119.79	111.50
4	A	304	PT5	O16-C10-C12	3.85	119.79	111.50
6	B	301	LPP	O9-C11-C12	3.85	119.79	111.50
6	A	301	LPP	O9-C11-C12	3.84	119.78	111.50
4	B	304	PT5	O16-C10-C12	3.83	119.75	111.50
4	D	303	PT5	O16-C10-C12	3.80	119.68	111.50
4	C	304	PT5	O16-C10-C12	3.68	119.44	111.50
4	D	303	PT5	O18-C11-C31	2.85	120.85	111.91
4	B	304	PT5	O18-C11-C31	2.75	120.53	111.91
4	A	304	PT5	O18-C11-C31	2.74	120.52	111.91
4	C	304	PT5	O18-C11-C31	2.61	120.11	111.91
3	B	303	LBN	O5-C25-C26	2.54	119.87	111.91
3	C	303	LBN	O5-C25-C26	2.53	119.86	111.91
3	A	303	LBN	O5-C25-C26	2.53	119.84	111.91
3	D	302	LBN	O5-C25-C26	2.52	119.83	111.91
6	C	301	LPP	O27-C29-C30	2.32	119.20	111.91
6	A	301	LPP	O27-C29-C30	2.32	119.19	111.91
6	D	305	LPP	O27-C29-C30	2.32	119.18	111.91
6	B	301	LPP	O27-C29-C30	2.30	119.14	111.91
3	A	303	LBN	C8-C5-C42	-2.04	109.11	124.73

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	D	302	LBN	C8-C5-C42	-2.03	109.16	124.73
3	B	303	LBN	C8-C5-C42	-2.03	109.19	124.73
3	C	303	LBN	C8-C5-C42	-2.02	109.20	124.73

There are no chirality outliers.

All (219) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	D	303	PT5	C7-O13-P1-O11
4	D	303	PT5	C1-O1-P1-O12
4	A	304	PT5	C7-O13-P1-O11
4	A	304	PT5	C1-O1-P1-O12
4	B	304	PT5	C7-O13-P1-O11
4	B	304	PT5	C1-O1-P1-O12
4	C	304	PT5	C7-O13-P1-O1
4	C	304	PT5	C1-O1-P1-O12
4	C	304	PT5	C1-O1-P1-O11
6	D	305	LPP	C6-O5-P1-O2
6	D	305	LPP	C6-O5-P1-O4
6	A	301	LPP	C6-O5-P1-O2
6	A	301	LPP	C6-O5-P1-O4
6	B	301	LPP	C6-O5-P1-O2
6	B	301	LPP	C6-O5-P1-O3
6	B	301	LPP	C6-O5-P1-O4
6	C	301	LPP	C6-O5-P1-O2
6	C	301	LPP	C6-O5-P1-O3
6	C	301	LPP	C6-O5-P1-O4
4	D	303	PT5	O17-C10-O16-C8
4	B	304	PT5	O17-C10-O16-C8
4	D	303	PT5	C12-C10-O16-C8
4	A	304	PT5	C12-C10-O16-C8
4	B	304	PT5	C12-C10-O16-C8
4	C	304	PT5	C12-C10-O16-C8
4	A	304	PT5	O17-C10-O16-C8
4	C	304	PT5	O17-C10-O16-C8
3	D	302	LBN	C26-C25-O5-C3
3	A	303	LBN	C26-C25-O5-C3
3	B	303	LBN	C26-C25-O5-C3
3	C	303	LBN	C26-C25-O5-C3
3	D	302	LBN	O6-C25-O5-C3
3	D	302	LBN	C41-C42-C5-C8
3	A	303	LBN	C41-C42-C5-C8

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Mol	Chain	Res	Type	Atoms
3	B	303	LBN	C41-C42-C5-C8
3	C	303	LBN	C41-C42-C5-C8
3	A	303	LBN	O6-C25-O5-C3
3	B	303	LBN	O6-C25-O5-C3
3	C	303	LBN	O6-C25-O5-C3
4	D	303	PT5	C40-C41-C42-C43
4	A	304	PT5	C40-C41-C42-C43
4	B	304	PT5	C40-C41-C42-C43
4	C	304	PT5	C40-C41-C42-C43
4	D	303	PT5	C38-C39-C40-C41
4	C	304	PT5	C38-C39-C40-C41
4	B	304	PT5	C38-C39-C40-C41
3	A	303	LBN	C31-C32-C33-C4
4	A	304	PT5	C38-C39-C40-C41
6	A	301	LPP	C36-C37-C38-C39
6	B	301	LPP	C36-C37-C38-C39
6	D	305	LPP	C34-C35-C36-C37
6	C	301	LPP	C36-C37-C38-C39
3	D	302	LBN	C31-C32-C33-C4
3	B	303	LBN	C31-C32-C33-C4
3	C	303	LBN	C31-C32-C33-C4
3	C	303	LBN	C38-C39-C40-C41
3	A	303	LBN	C33-C4-C7-C10
3	A	303	LBN	C38-C39-C40-C41
3	D	302	LBN	C38-C39-C40-C41
3	B	303	LBN	C33-C4-C7-C10
3	B	303	LBN	C38-C39-C40-C41
3	C	303	LBN	C33-C4-C7-C10
3	D	302	LBN	C33-C4-C7-C10
6	B	301	LPP	C39-C40-C41-C42
6	C	301	LPP	C39-C40-C41-C42
6	D	305	LPP	C36-C37-C38-C39
6	A	301	LPP	C39-C40-C41-C42
6	B	301	LPP	C40-C41-C42-C43
6	C	301	LPP	C40-C41-C42-C43
3	D	302	LBN	C1-C2-C3-O5
3	B	303	LBN	C1-C2-C3-O5
6	D	305	LPP	C40-C41-C42-C43
6	A	301	LPP	C34-C35-C36-C37
6	A	301	LPP	C40-C41-C42-C43
3	D	302	LBN	C39-C40-C41-C42
3	A	303	LBN	C39-C40-C41-C42

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Mol	Chain	Res	Type	Atoms
3	B	303	LBN	C39-C40-C41-C42
3	C	303	LBN	C39-C40-C41-C42
6	C	301	LPP	C34-C35-C36-C37
4	B	304	PT5	C34-C35-C36-C37
6	B	301	LPP	C34-C35-C36-C37
3	A	303	LBN	C14-C17-C20-C22
4	C	304	PT5	C34-C35-C36-C37
6	D	305	LPP	C39-C40-C41-C42
4	A	304	PT5	C34-C35-C36-C37
4	C	304	PT5	C1-O1-P1-O13
4	D	303	PT5	C34-C35-C36-C37
3	C	303	LBN	C14-C17-C20-C22
3	D	302	LBN	C35-C34-O7-C2
3	A	303	LBN	C35-C34-O7-C2
3	B	303	LBN	C35-C34-O7-C2
3	C	303	LBN	C35-C34-O7-C2
3	B	303	LBN	C14-C17-C20-C22
3	D	302	LBN	C14-C17-C20-C22
3	D	302	LBN	O8-C34-O7-C2
4	C	304	PT5	C33-C34-C35-C36
3	A	303	LBN	O8-C34-O7-C2
3	B	303	LBN	O8-C34-O7-C2
3	C	303	LBN	O8-C34-O7-C2
6	B	301	LPP	C12-C11-O9-C7
6	C	301	LPP	C12-C11-O9-C7
4	D	303	PT5	C33-C34-C35-C36
4	B	304	PT5	C33-C34-C35-C36
3	A	303	LBN	C1-C2-C3-O5
3	C	303	LBN	C1-C2-C3-O5
4	C	304	PT5	C7-C8-C9-O18
4	D	303	PT5	C1-O1-P1-O13
4	A	304	PT5	C1-O1-P1-O13
4	B	304	PT5	C1-O1-P1-O13
3	D	302	LBN	C14-C11-C8-C5
3	B	303	LBN	C14-C11-C8-C5
3	C	303	LBN	C14-C11-C8-C5
6	A	301	LPP	C12-C11-O9-C7
4	A	304	PT5	C33-C34-C35-C36
4	D	303	PT5	C7-C8-O16-C10
4	A	304	PT5	C7-C8-O16-C10
4	B	304	PT5	C7-C8-O16-C10
4	C	304	PT5	C7-C8-O16-C10

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Mol	Chain	Res	Type	Atoms
6	D	305	LPP	C6-O5-P1-O3
6	A	301	LPP	C6-O5-P1-O3
3	D	302	LBN	C27-C28-C29-C30
3	D	302	LBN	C8-C11-C14-C17
3	A	303	LBN	C8-C11-C14-C17
3	C	303	LBN	C8-C11-C14-C17
3	B	303	LBN	C8-C11-C14-C17
3	B	303	LBN	C27-C28-C29-C30
4	D	303	PT5	C1-O1-P1-O11
4	A	304	PT5	C1-O1-P1-O11
4	B	304	PT5	C1-O1-P1-O11
3	A	303	LBN	C27-C28-C29-C30
3	C	303	LBN	C27-C28-C29-C30
4	D	303	PT5	C15-C16-C17-C18
4	A	304	PT5	C15-C16-C17-C18
4	B	304	PT5	C15-C16-C17-C18
4	C	304	PT5	C15-C16-C17-C18
3	A	303	LBN	C14-C11-C8-C5
6	D	305	LPP	C12-C11-O9-C7
6	A	301	LPP	O10-C11-O9-C7
6	B	301	LPP	O10-C11-O9-C7
6	C	301	LPP	O10-C11-O9-C7
3	B	303	LBN	C28-C29-C30-C31
6	B	301	LPP	C32-C33-C34-C35
3	C	303	LBN	C28-C29-C30-C31
3	D	302	LBN	C28-C29-C30-C31
6	C	301	LPP	C32-C33-C34-C35
3	A	303	LBN	C28-C29-C30-C31
6	D	305	LPP	O10-C11-O9-C7
3	A	303	LBN	O7-C2-C3-O5
3	C	303	LBN	O7-C2-C3-O5
6	A	301	LPP	C32-C33-C34-C35
3	A	303	LBN	C30-C31-C32-C33
4	D	303	PT5	C7-O13-P1-O1
4	B	304	PT5	C7-O13-P1-O1
4	C	304	PT5	C7-O13-P1-O11
4	A	304	PT5	O13-C7-C8-C9
6	A	301	LPP	O5-C6-C7-C8
6	B	301	LPP	O5-C6-C7-C8
6	C	301	LPP	O5-C6-C7-C8
3	D	302	LBN	C30-C31-C32-C33
3	B	303	LBN	C30-C31-C32-C33

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Mol	Chain	Res	Type	Atoms
6	D	305	LPP	C22-C23-C24-C25
3	D	302	LBN	O7-C2-C3-O5
3	B	303	LBN	O7-C2-C3-O5
3	C	303	LBN	C30-C31-C32-C33
6	D	305	LPP	C32-C33-C34-C35
6	D	305	LPP	C35-C36-C37-C38
6	C	301	LPP	C22-C23-C24-C25
3	D	302	LBN	C40-C41-C42-C5
3	A	303	LBN	C40-C41-C42-C5
3	B	303	LBN	C40-C41-C42-C5
3	C	303	LBN	C40-C41-C42-C5
4	A	304	PT5	C7-O13-P1-O1
4	D	303	PT5	C7-C8-C9-O18
4	B	304	PT5	C7-C8-C9-O18
6	B	301	LPP	C22-C23-C24-C25
4	A	304	PT5	O18-C11-C31-C32
6	A	301	LPP	C22-C23-C24-C25
6	D	305	LPP	O5-C6-C7-C8
3	C	303	LBN	O1-C1-C2-O7
6	A	301	LPP	C35-C36-C37-C38
6	C	301	LPP	C35-C36-C37-C38
6	B	301	LPP	C35-C36-C37-C38
4	A	304	PT5	C7-C8-C9-O18
6	D	305	LPP	C6-C7-C8-O27
2	D	301	NAG	C4-C5-C6-O6
3	D	302	LBN	O1-C1-C2-O7
3	A	303	LBN	O1-C1-C2-O7
3	B	303	LBN	O1-C1-C2-O7
6	A	301	LPP	O5-C6-C7-O9
4	B	304	PT5	O13-C7-C8-C9
4	C	304	PT5	C39-C40-C41-C42
4	B	304	PT5	C39-C40-C41-C42
4	B	304	PT5	O18-C11-C31-C32
4	A	304	PT5	O13-C7-C8-O16
6	B	301	LPP	O5-C6-C7-O9
6	C	301	LPP	O5-C6-C7-O9
6	A	301	LPP	C21-C22-C23-C24
3	D	302	LBN	O1-C1-C2-C3
4	D	303	PT5	C39-C40-C41-C42
6	C	301	LPP	C21-C22-C23-C24
6	A	301	LPP	O9-C11-C12-C13
6	B	301	LPP	C21-C22-C23-C24

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Mol	Chain	Res	Type	Atoms
2	D	301	NAG	O5-C5-C6-O6
6	B	301	LPP	O9-C11-C12-C13
6	C	301	LPP	O9-C11-C12-C13
6	D	305	LPP	O9-C11-C12-C13
6	B	301	LPP	C30-C31-C32-C33
4	D	303	PT5	O18-C11-C31-C32
3	D	302	LBN	C42-C5-C8-C11
6	D	305	LPP	O10-C11-C12-C13
6	A	301	LPP	O10-C11-C12-C13
6	B	301	LPP	O10-C11-C12-C13
6	C	301	LPP	O10-C11-C12-C13
6	D	305	LPP	C21-C22-C23-C24
3	B	303	LBN	C42-C5-C8-C11
6	C	301	LPP	C30-C31-C32-C33
4	B	304	PT5	O13-C7-C8-O16
3	C	303	LBN	C42-C5-C8-C11
3	A	303	LBN	C7-C10-C13-C16

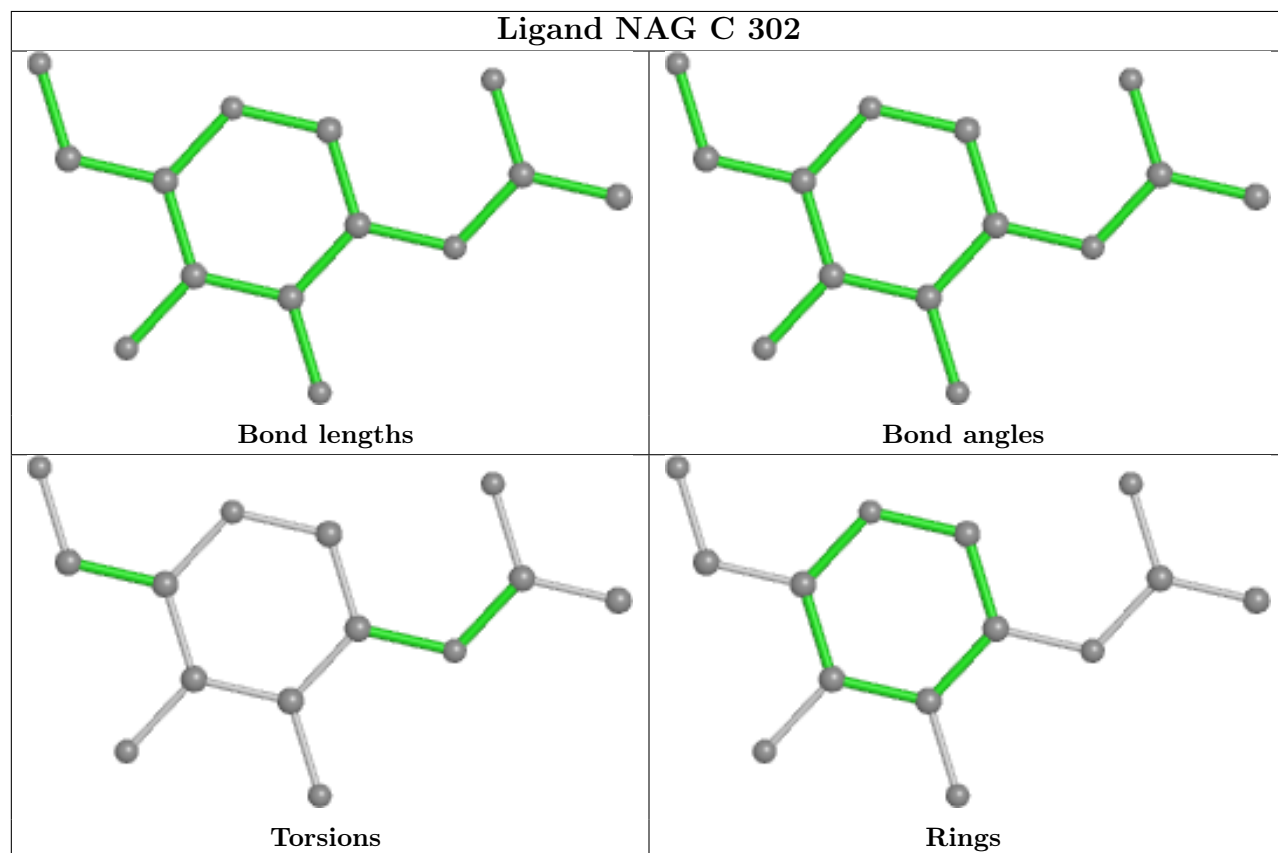
There are no ring outliers.

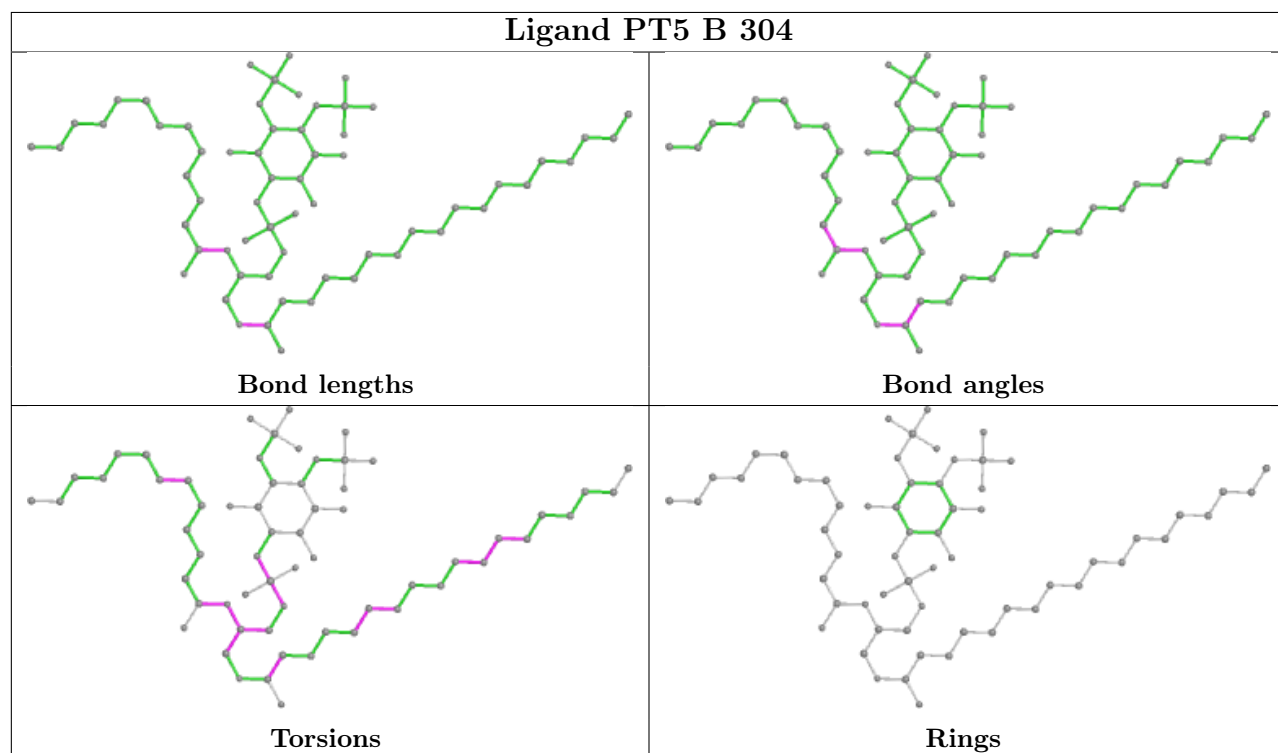
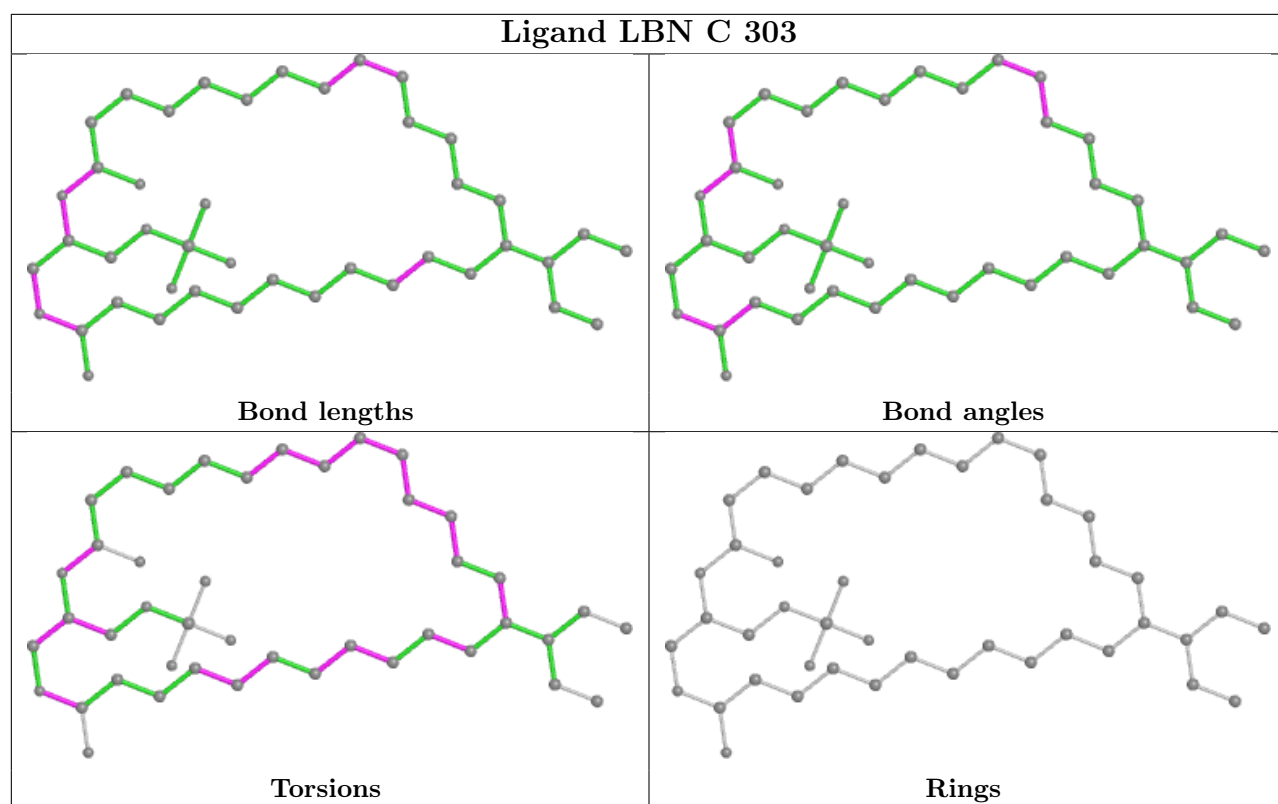
12 monomers are involved in 39 short contacts:

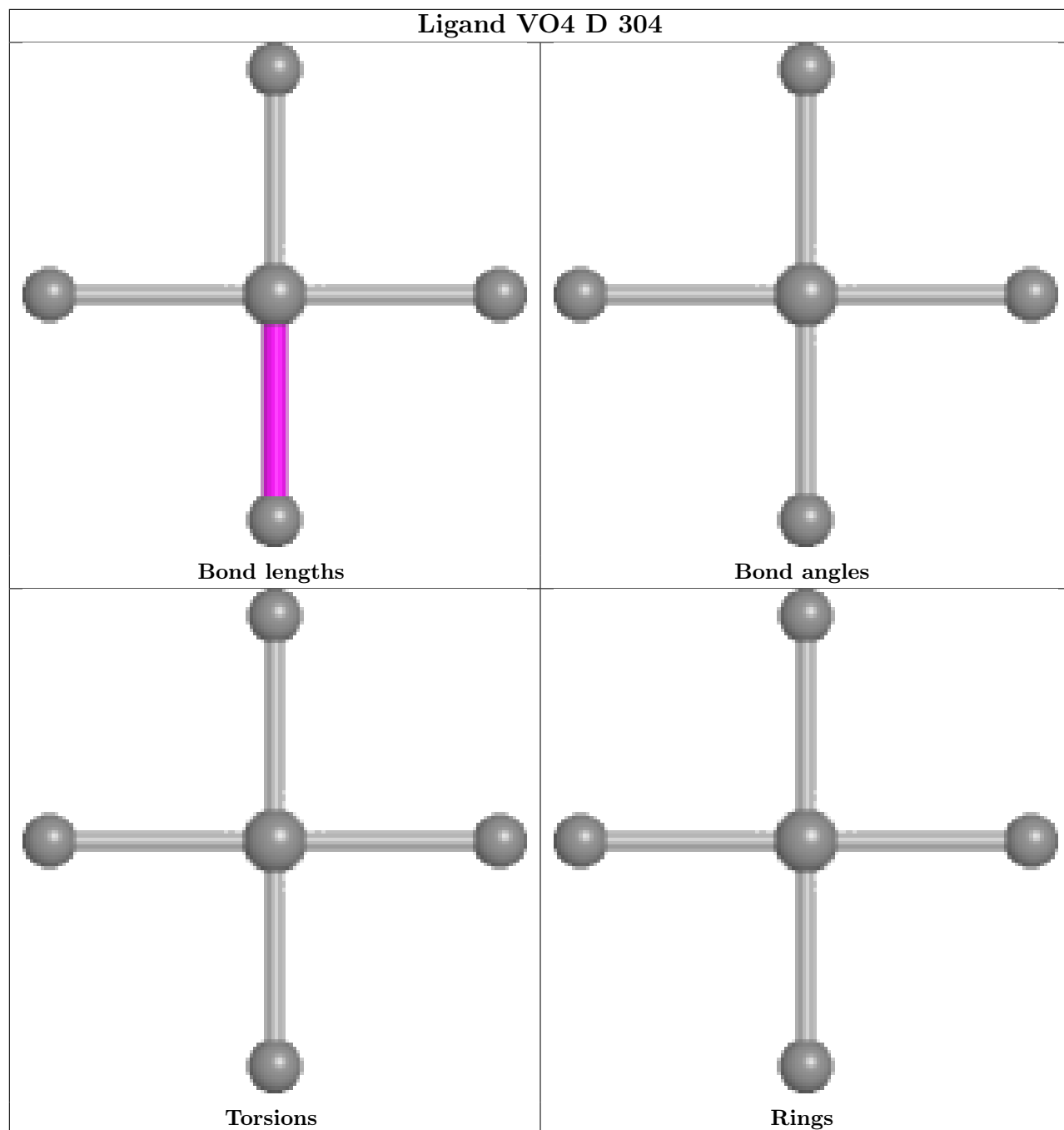
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	B	304	PT5	5	0
5	D	304	VO4	3	0
4	C	304	PT5	7	0
4	D	303	PT5	5	0
5	B	305	VO4	2	0
5	C	305	VO4	2	0
4	A	304	PT5	3	0
6	A	301	LPP	4	0
6	C	301	LPP	2	0
6	D	305	LPP	2	0
6	B	301	LPP	2	0
5	A	305	VO4	2	0

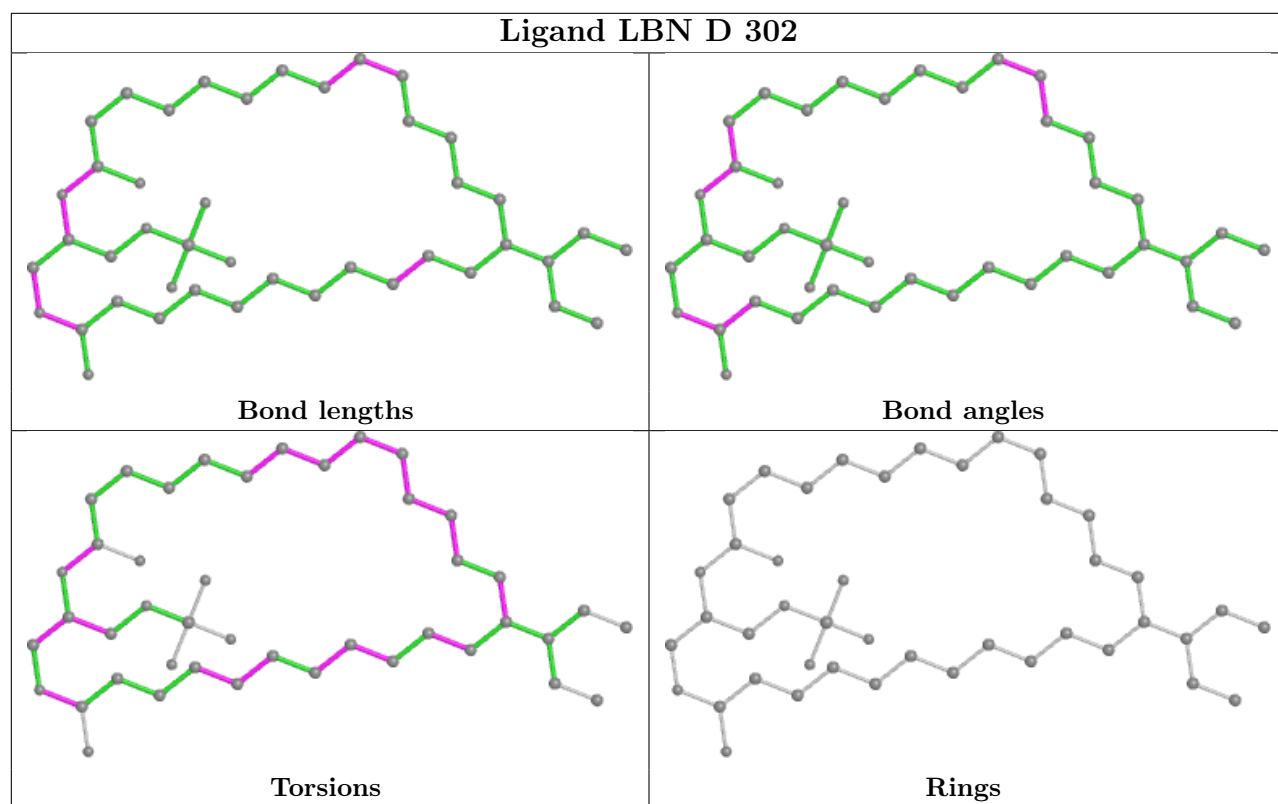
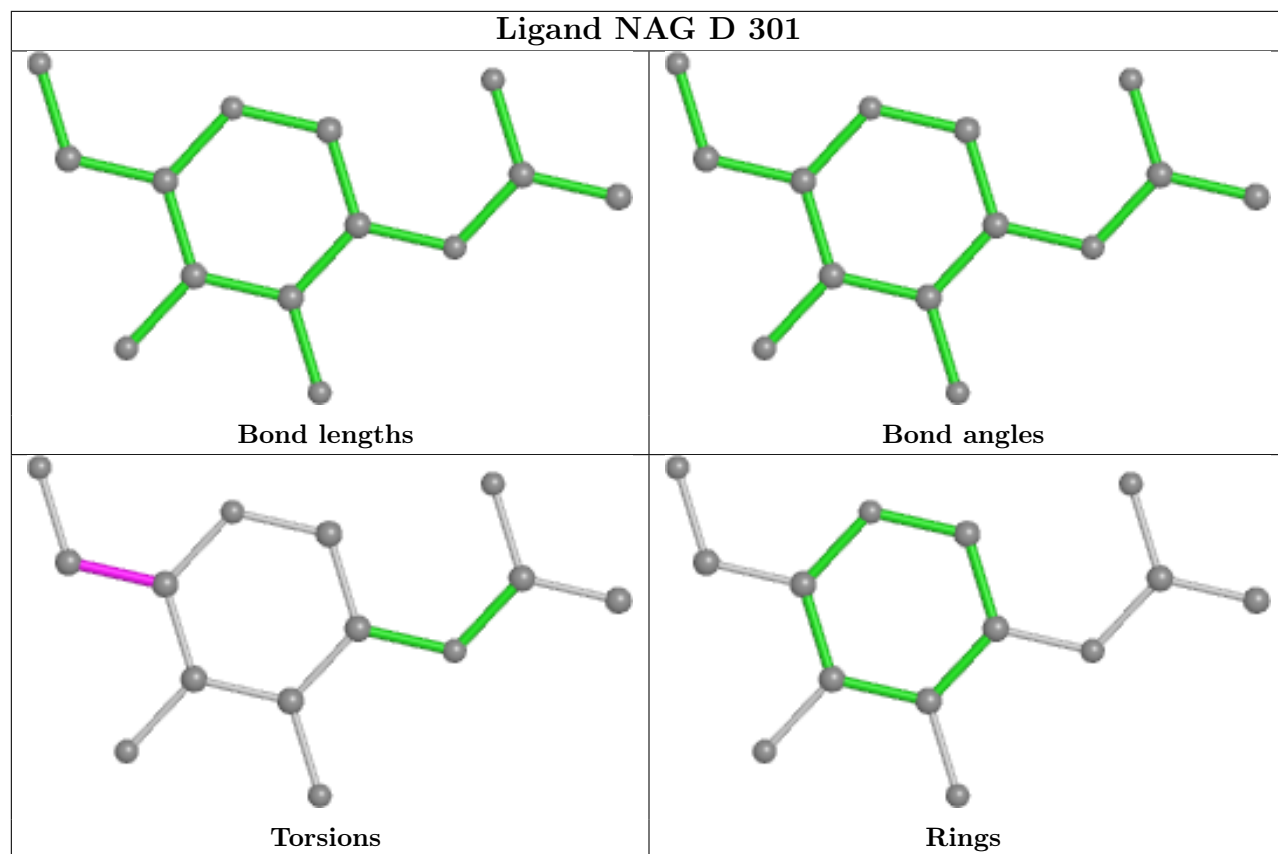
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

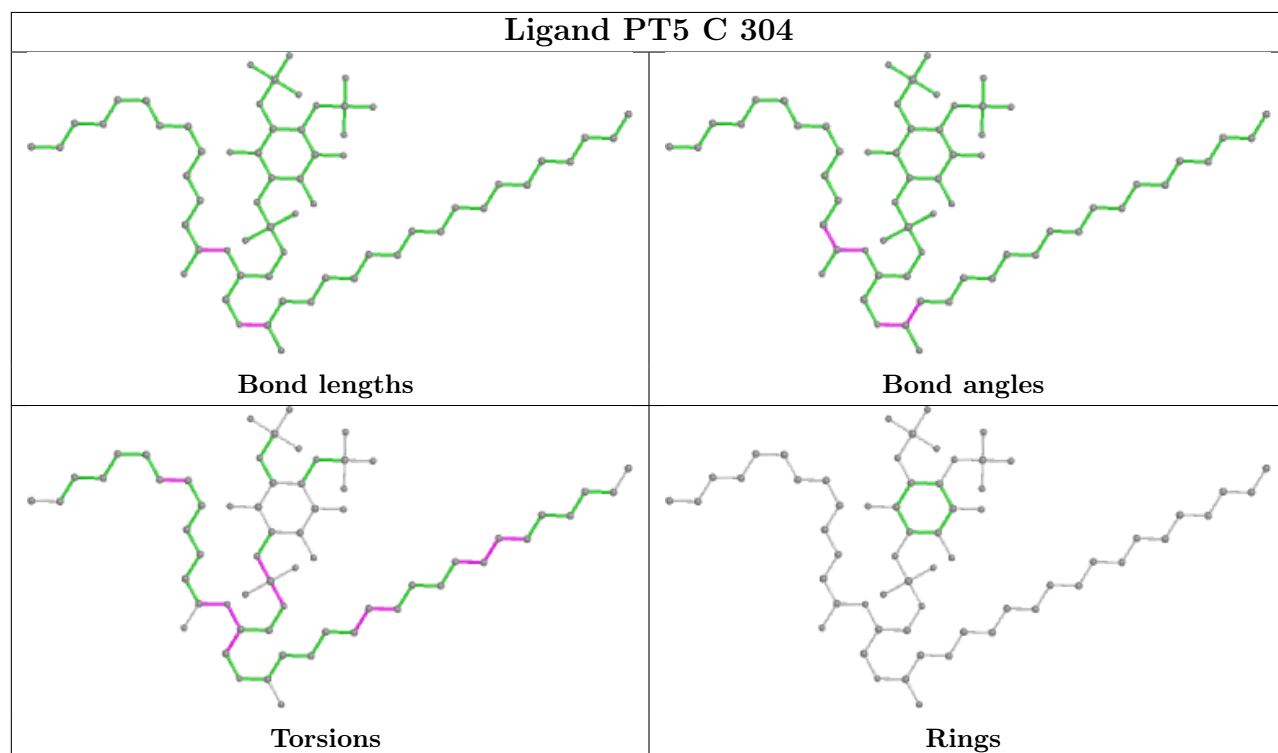
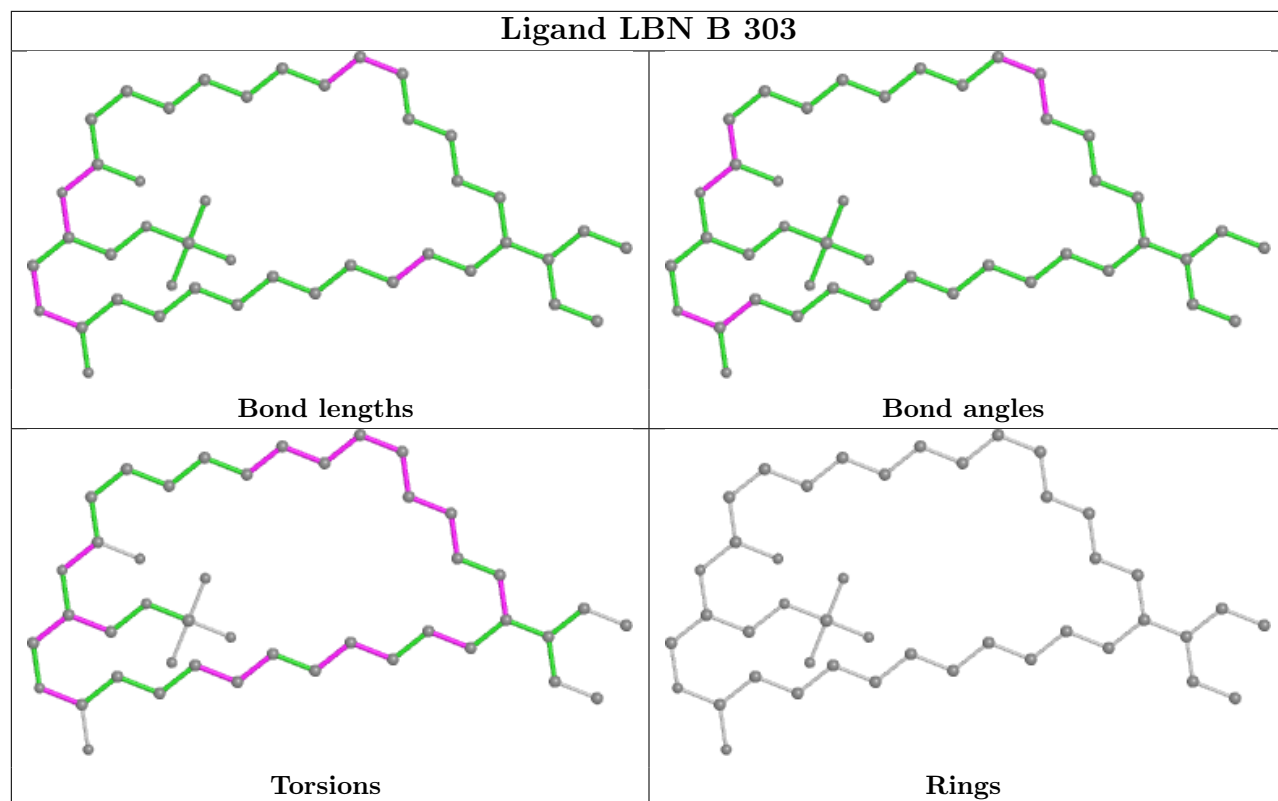
in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

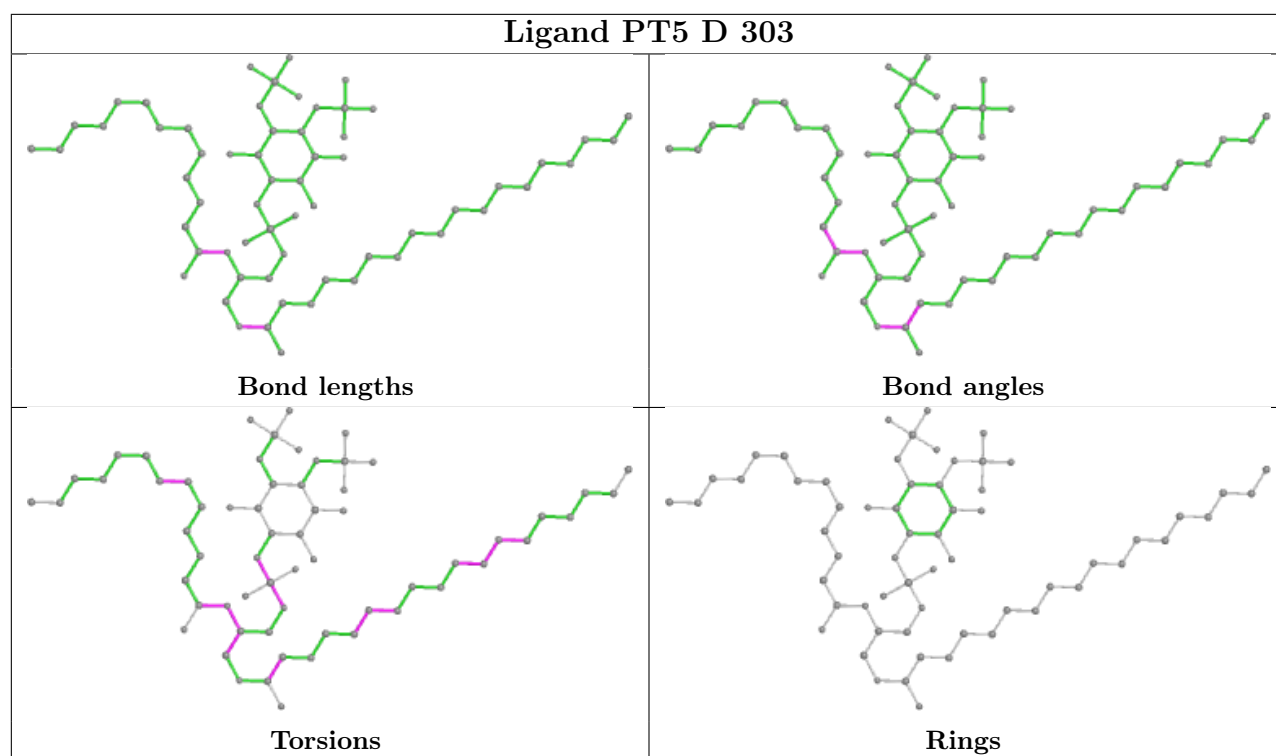


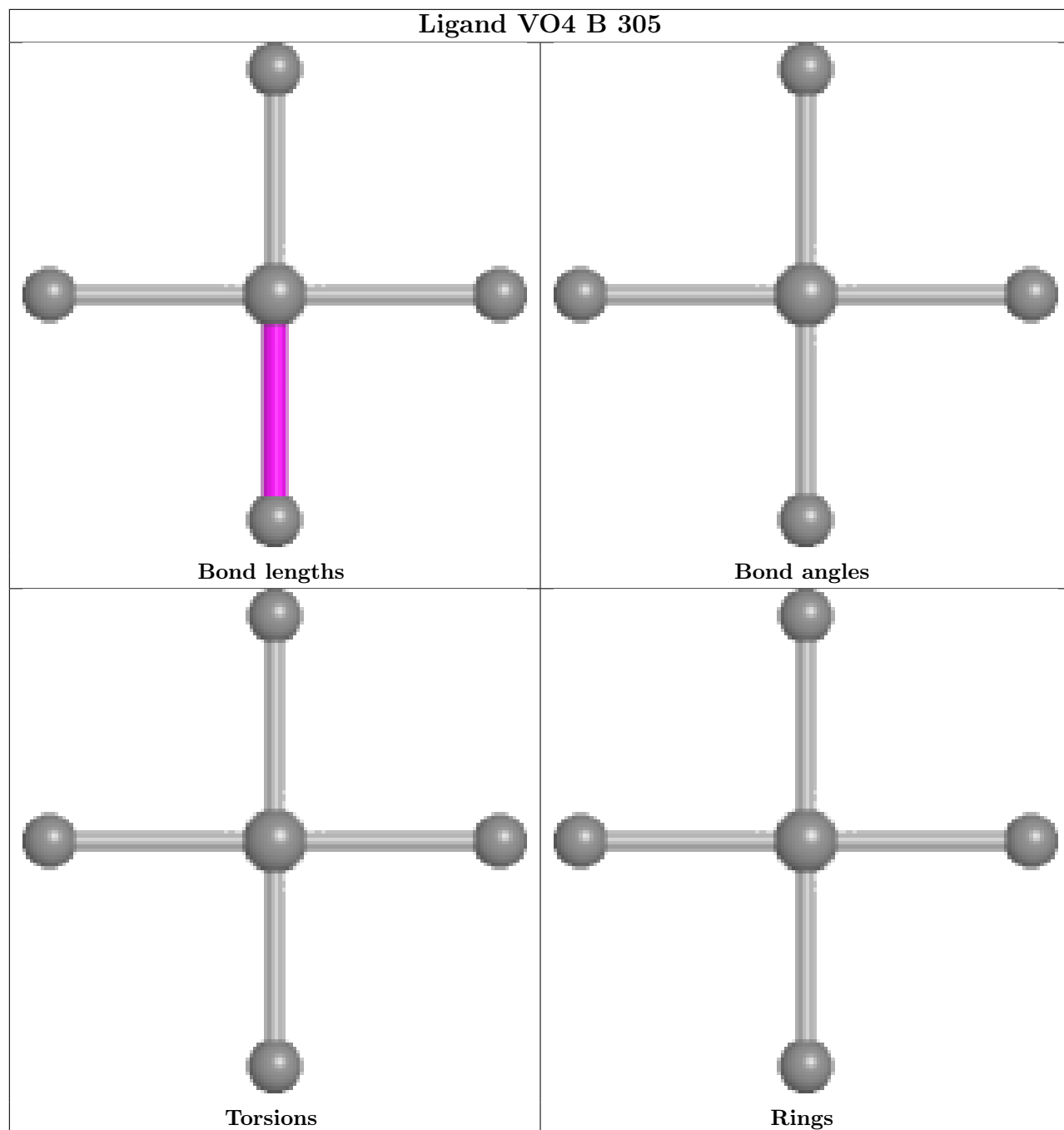


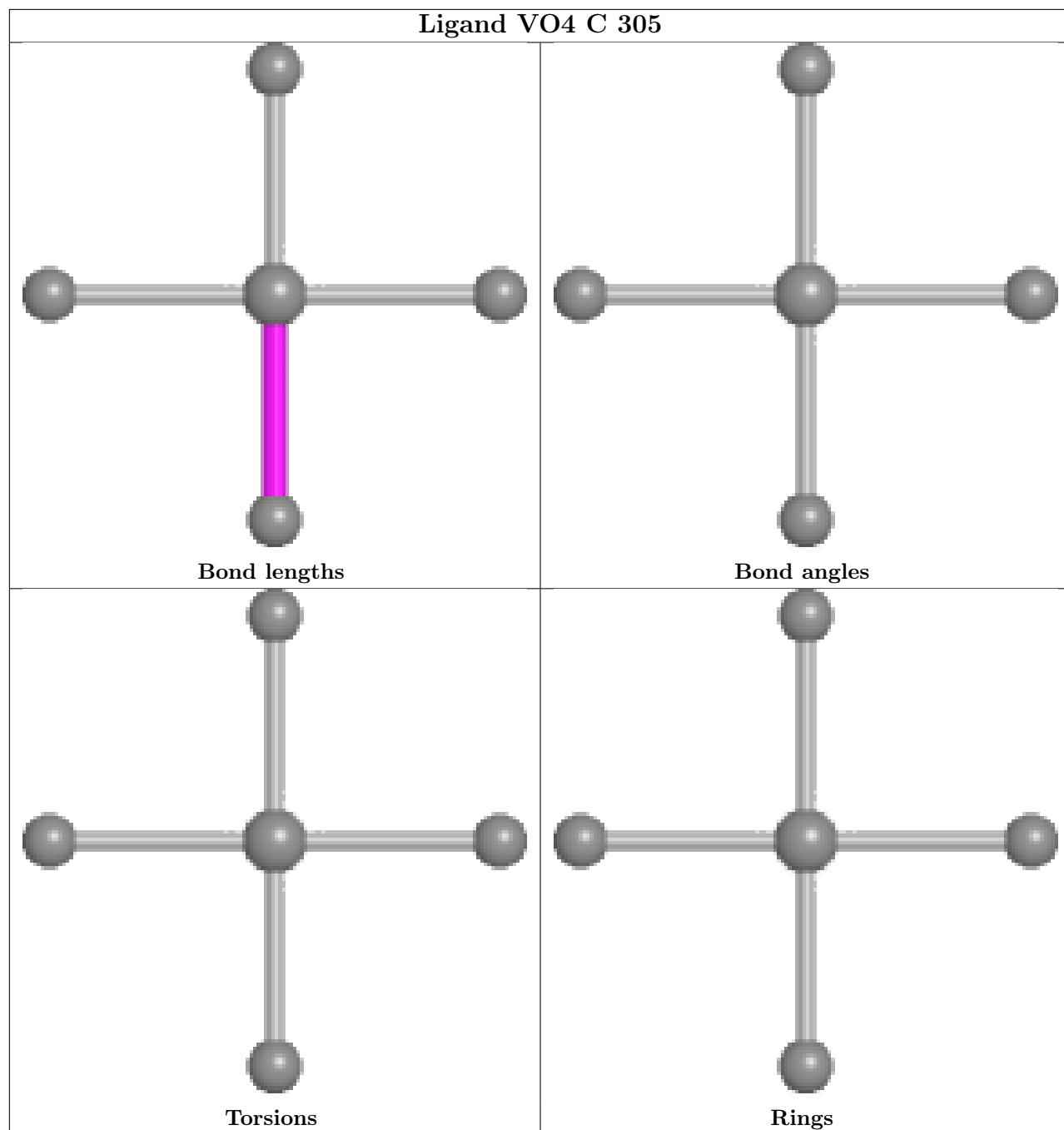




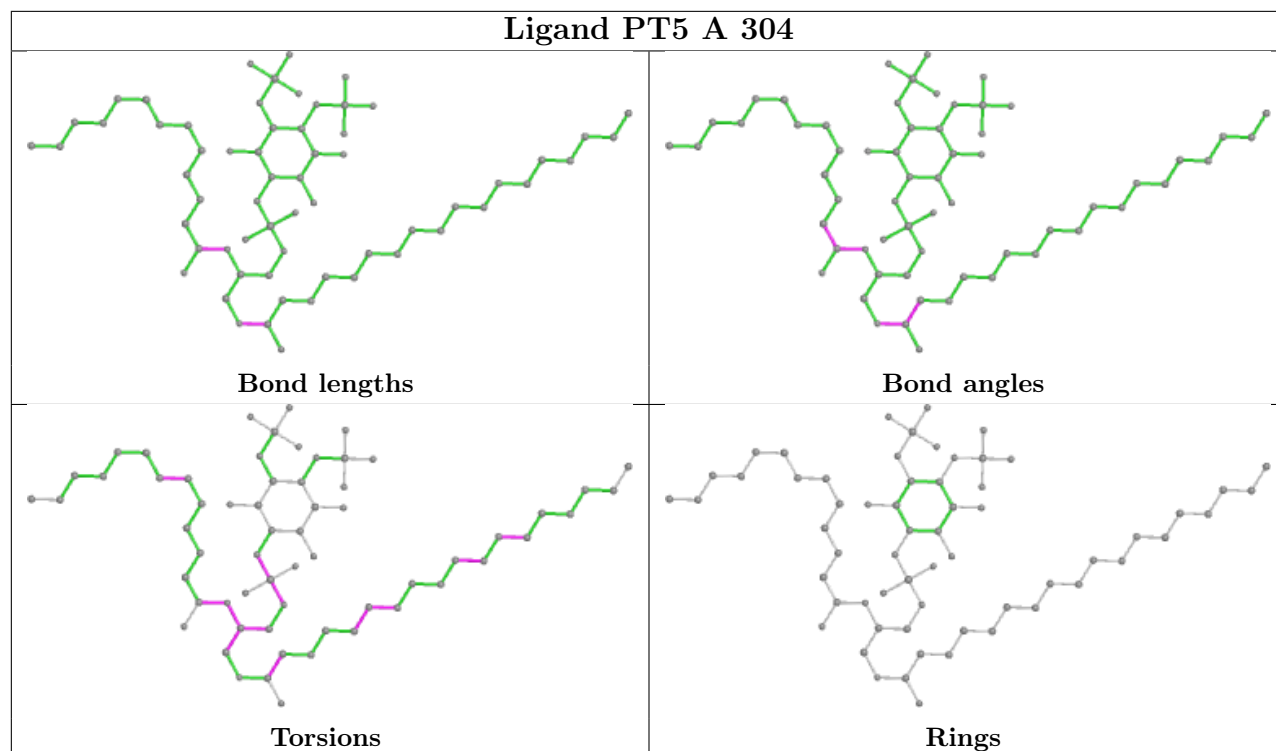




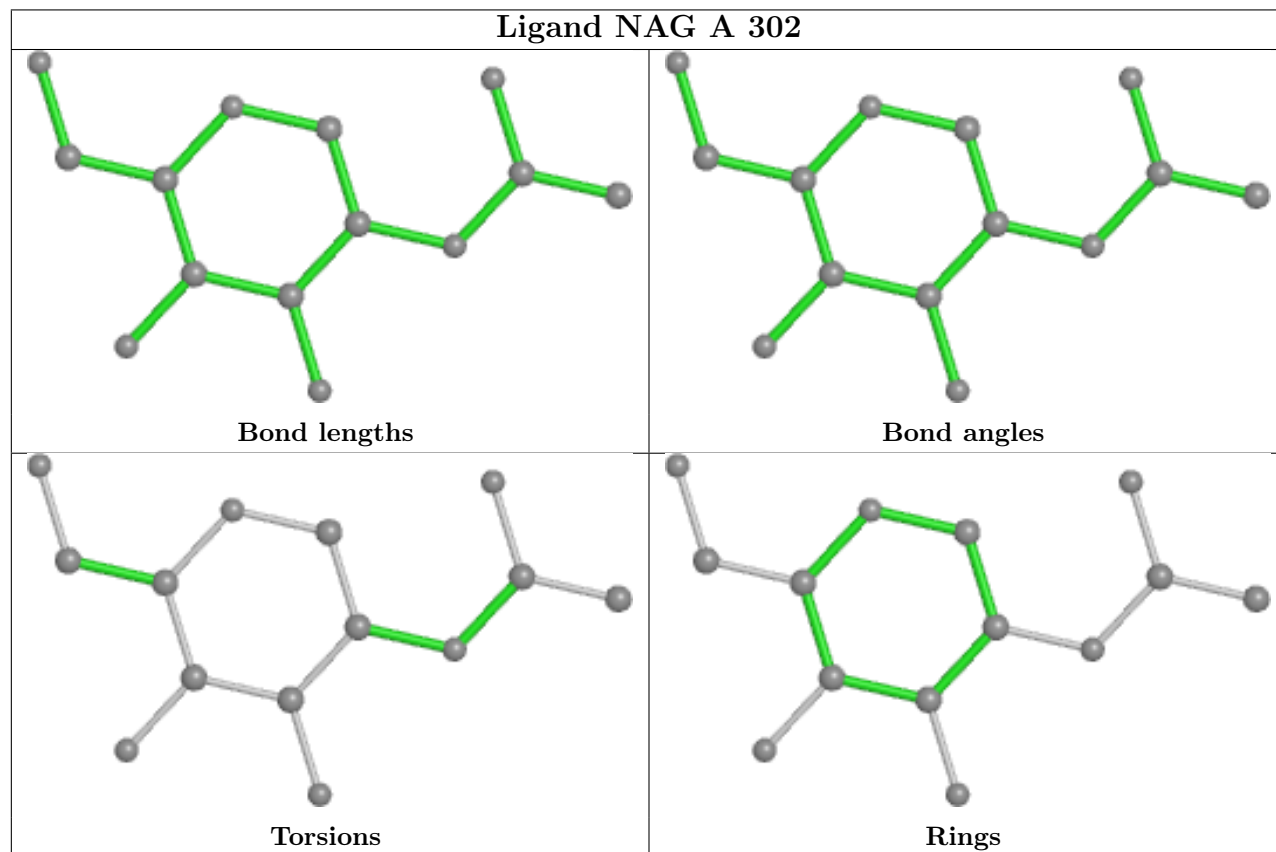


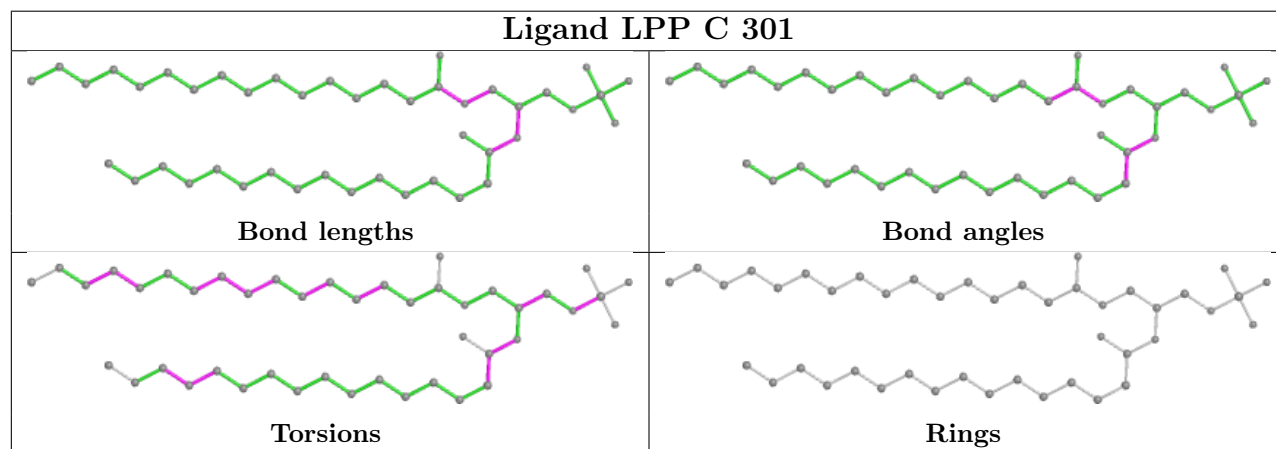
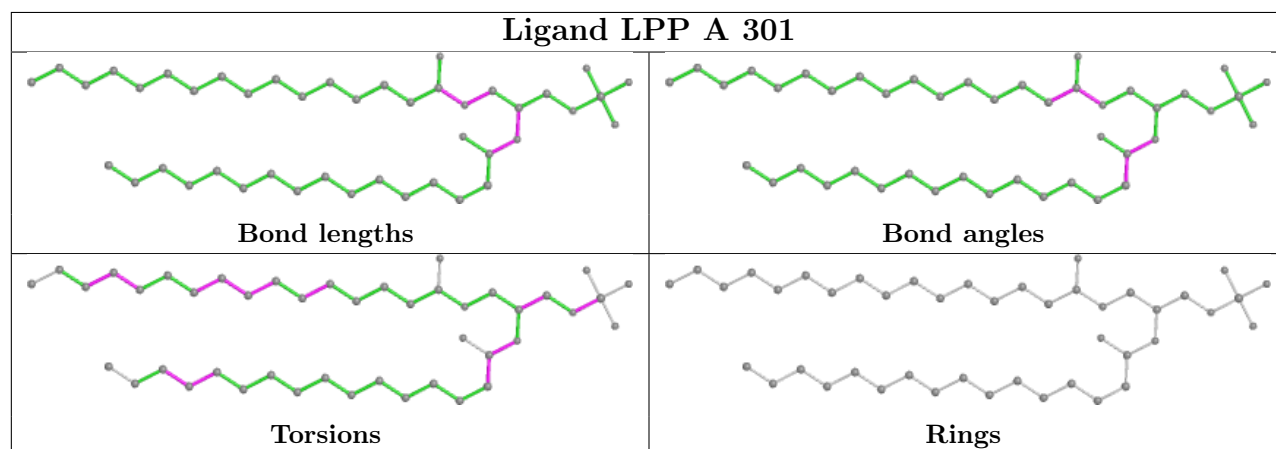
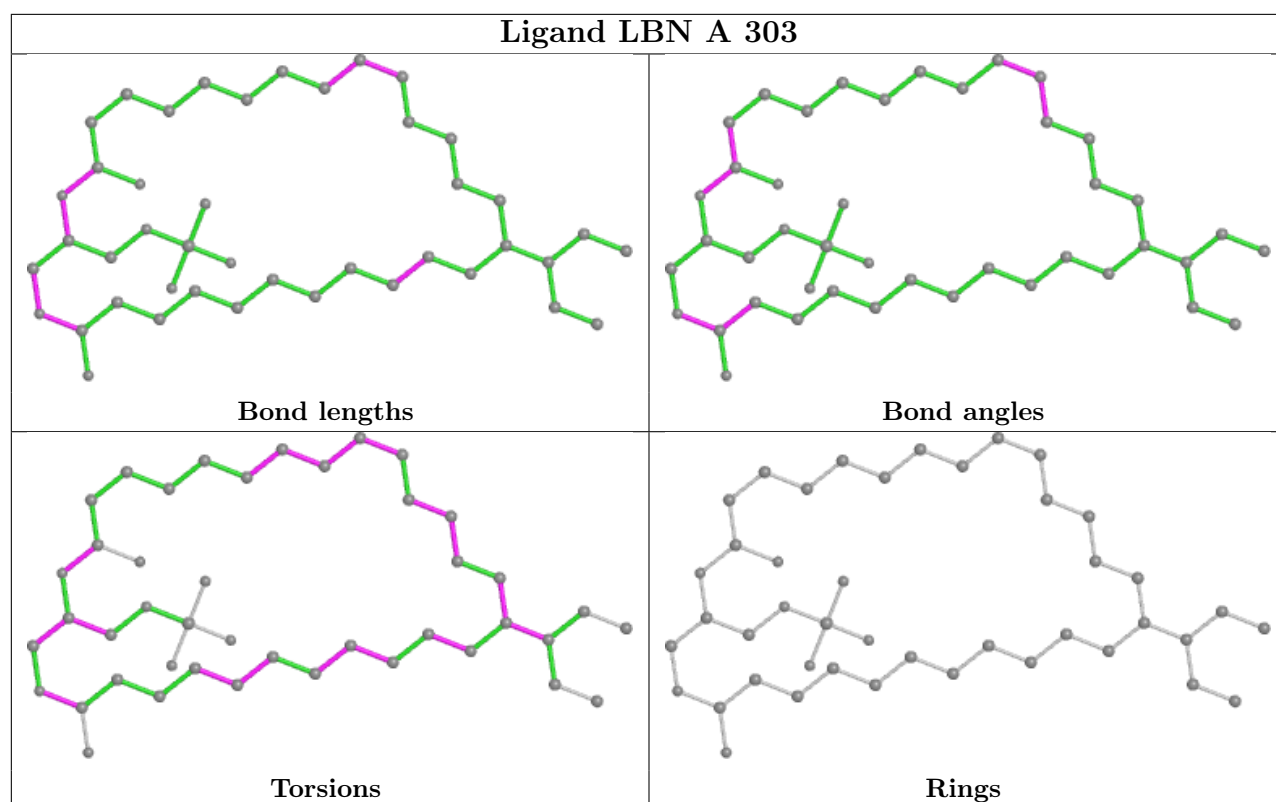


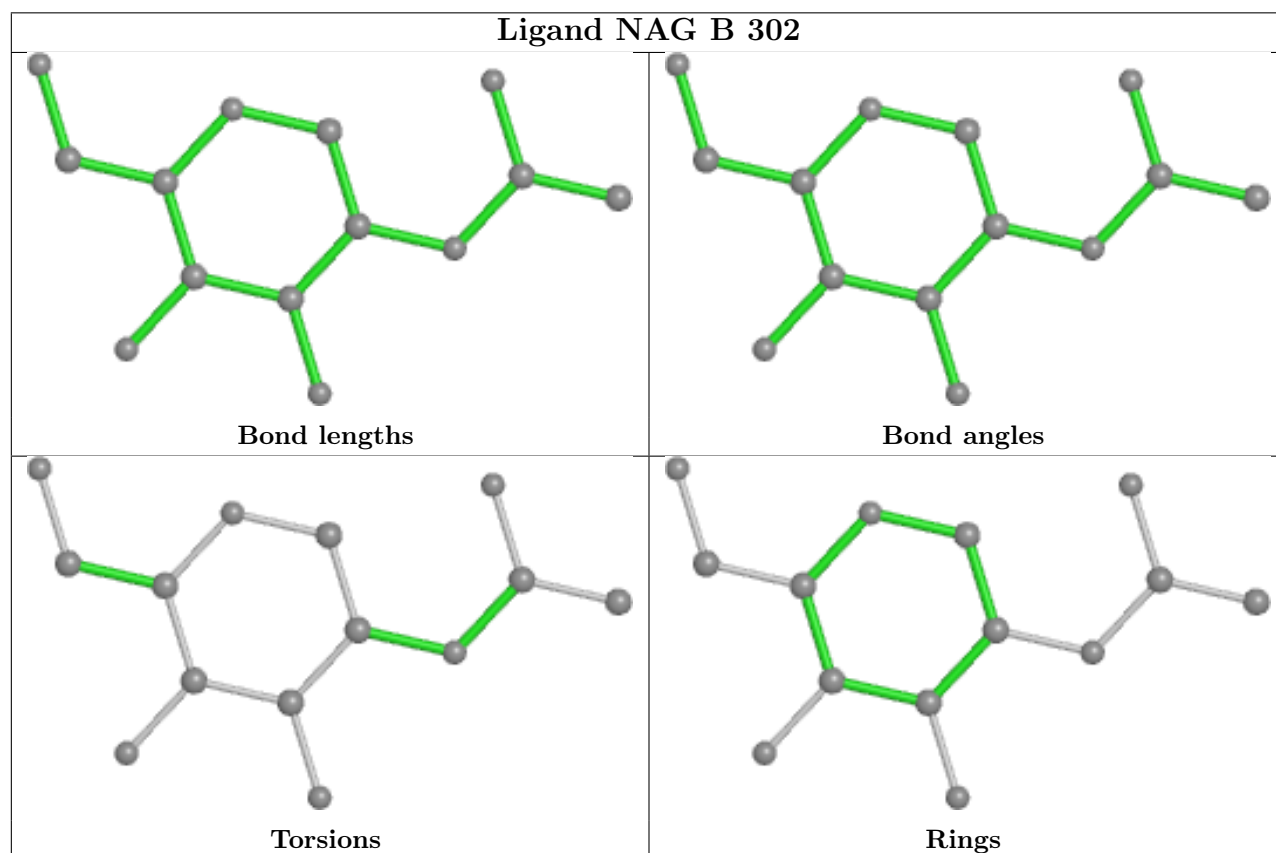
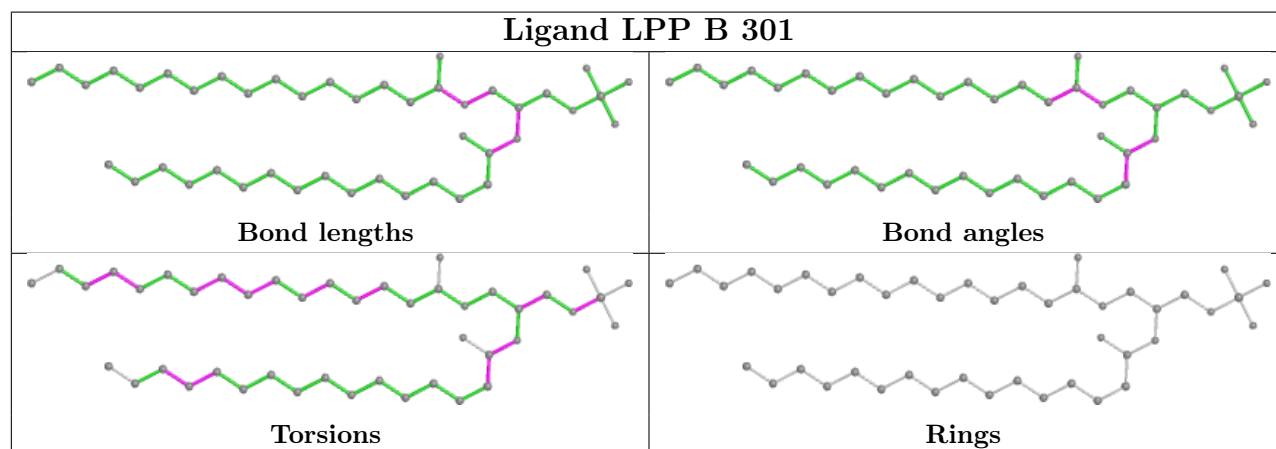
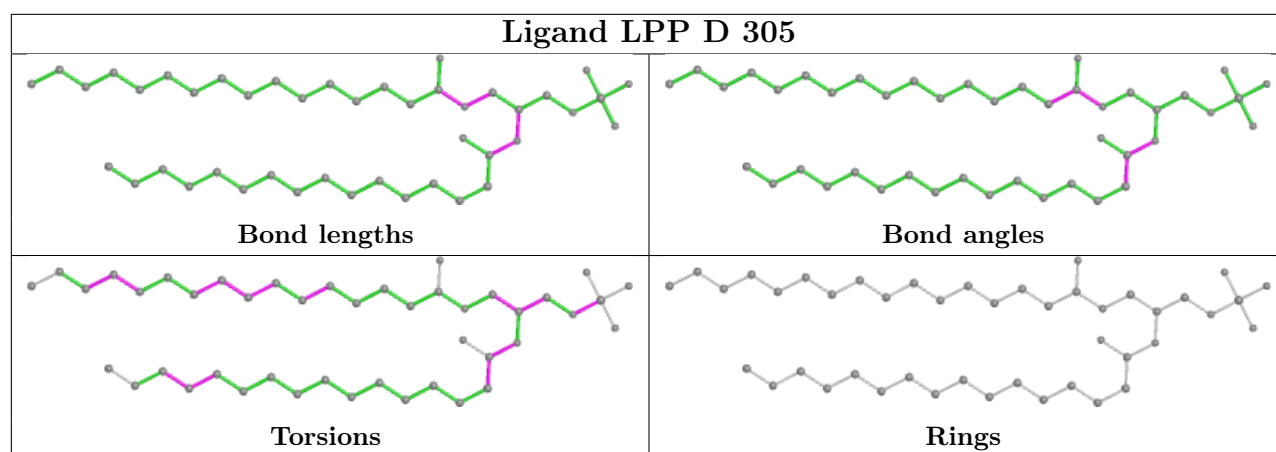
Ligand PT5 A 304

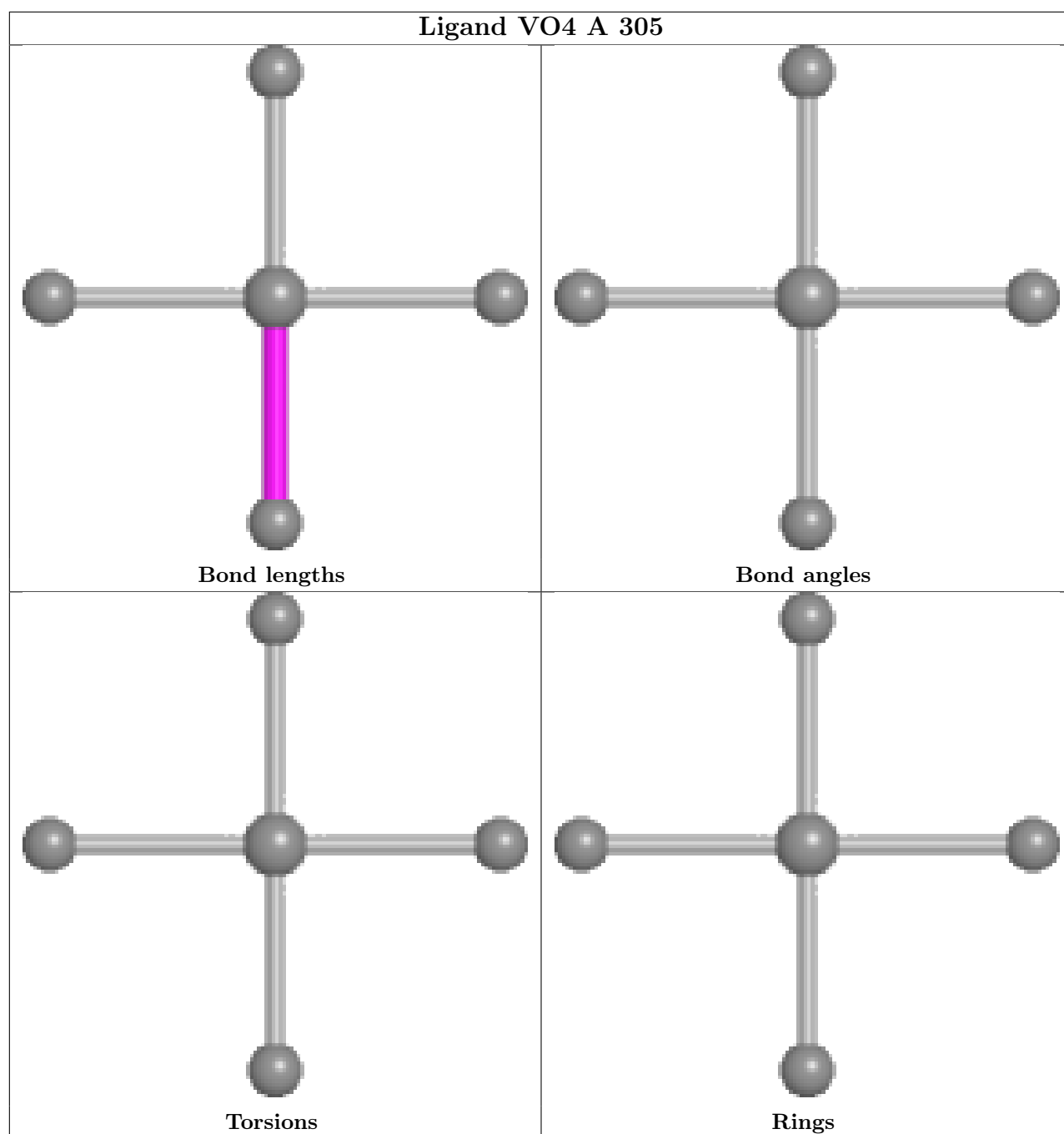


Ligand NAG A 302









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.

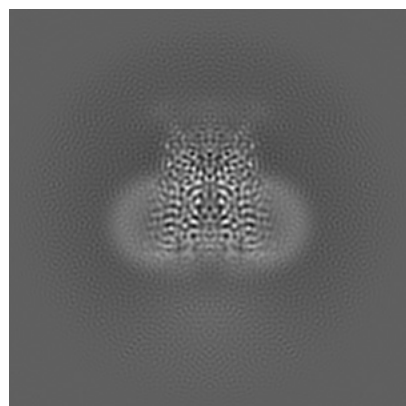
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-62722. These allow visual inspection of the internal detail of the map and identification of artifacts.

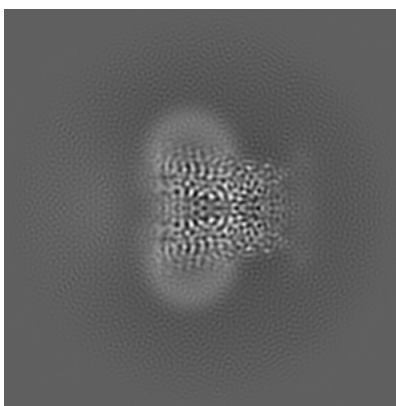
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

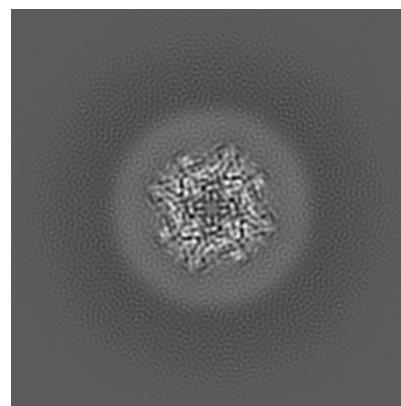
6.1.1 Primary map



X

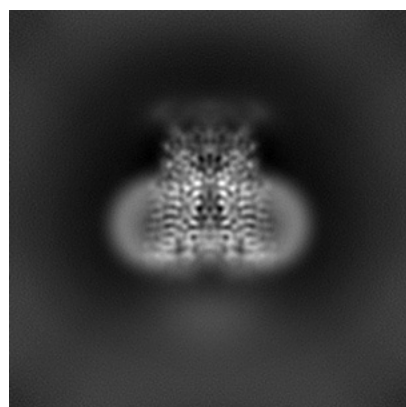


Y

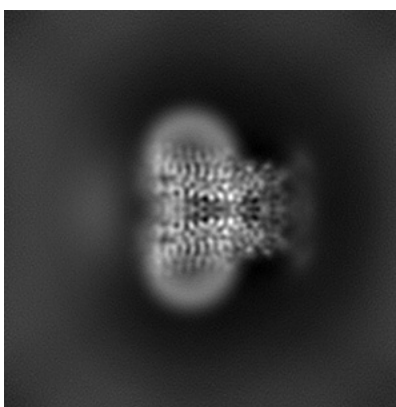


Z

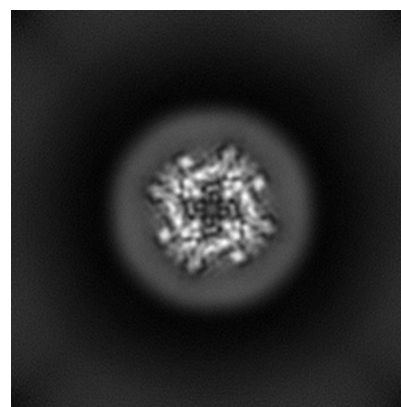
6.1.2 Raw map



X



Y

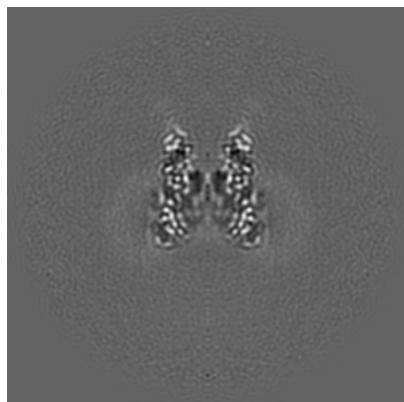


Z

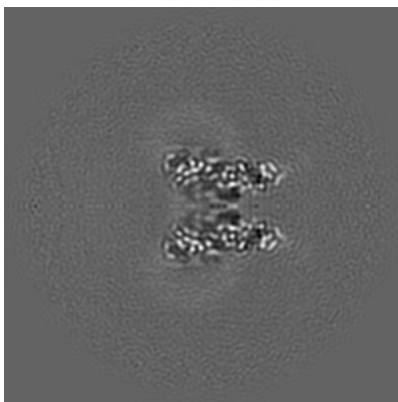
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

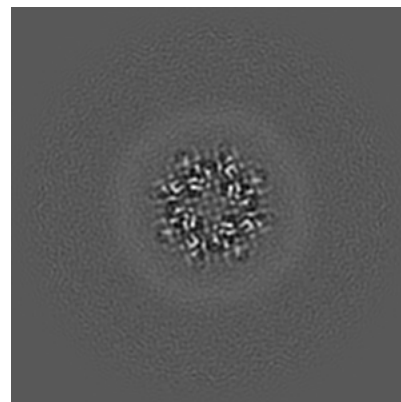
6.2.1 Primary map



X Index: 128

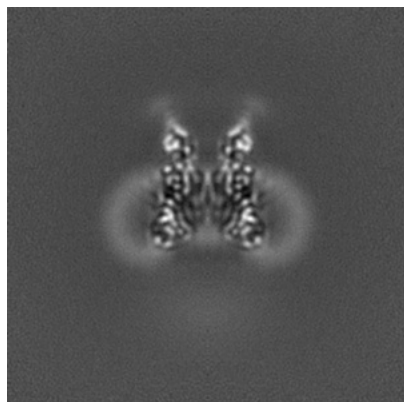


Y Index: 128

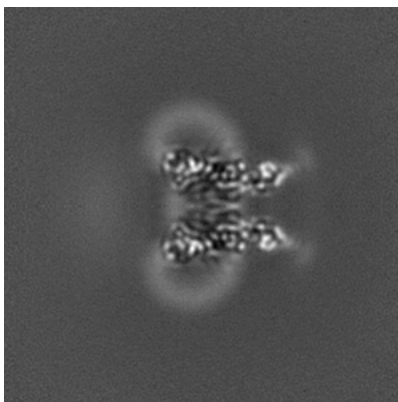


Z Index: 128

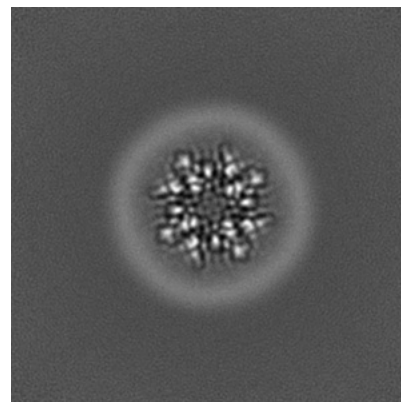
6.2.2 Raw map



X Index: 128



Y Index: 128

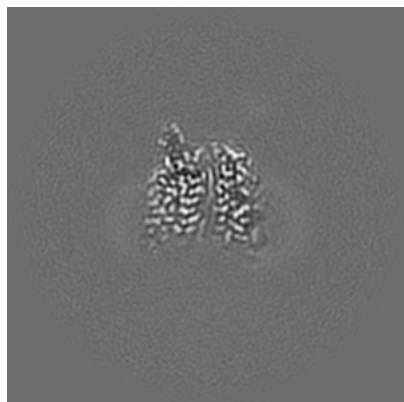


Z Index: 128

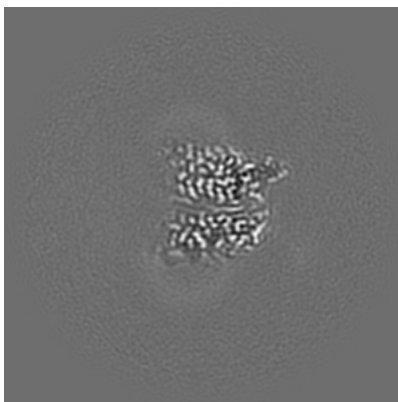
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

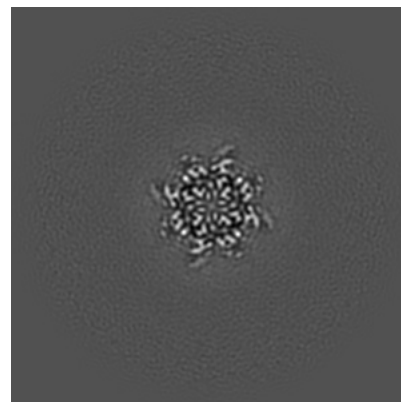
6.3.1 Primary map



X Index: 119

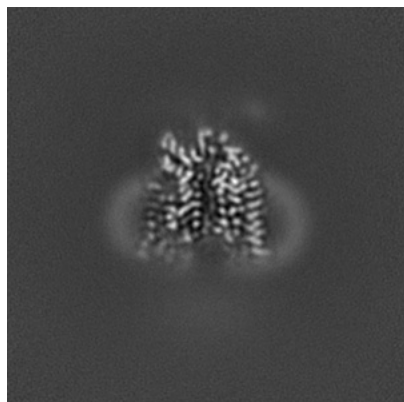


Y Index: 119

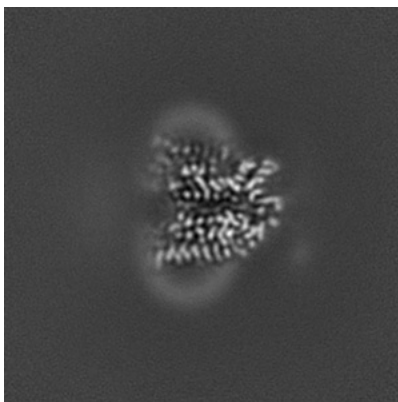


Z Index: 144

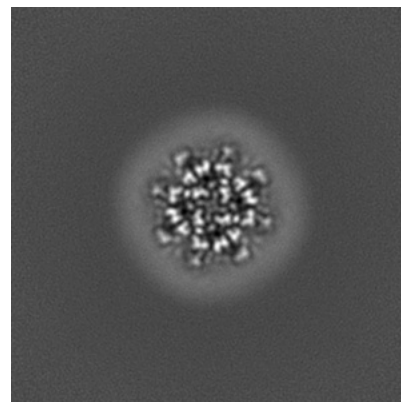
6.3.2 Raw map



X Index: 112



Y Index: 112

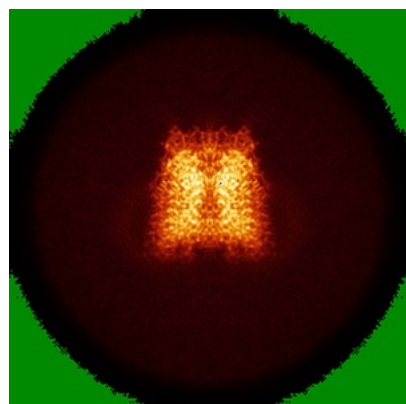


Z Index: 138

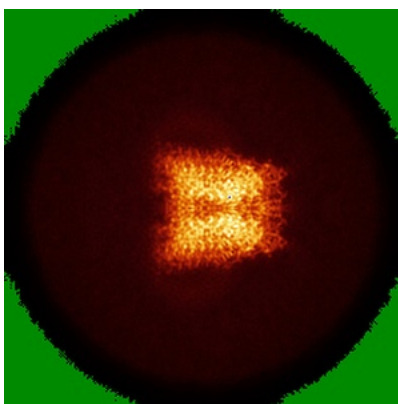
The images above show the largest variance slices of the map in three orthogonal directions.

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

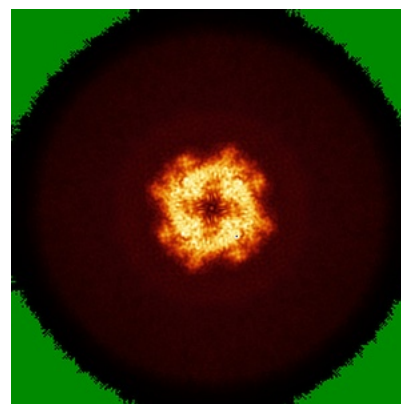
6.4.1 Primary map



X

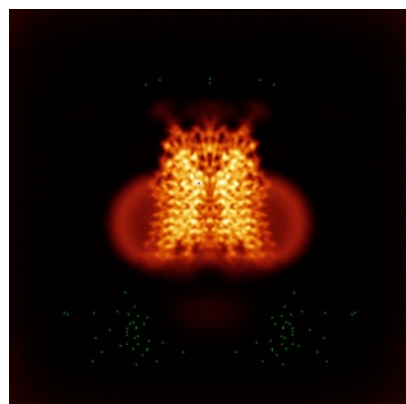


Y

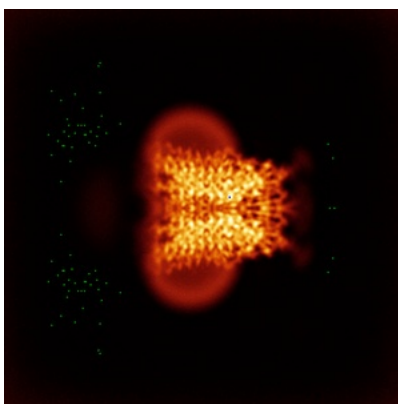


Z

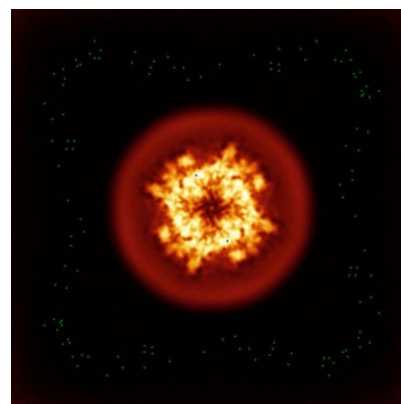
6.4.2 Raw map



X



Y

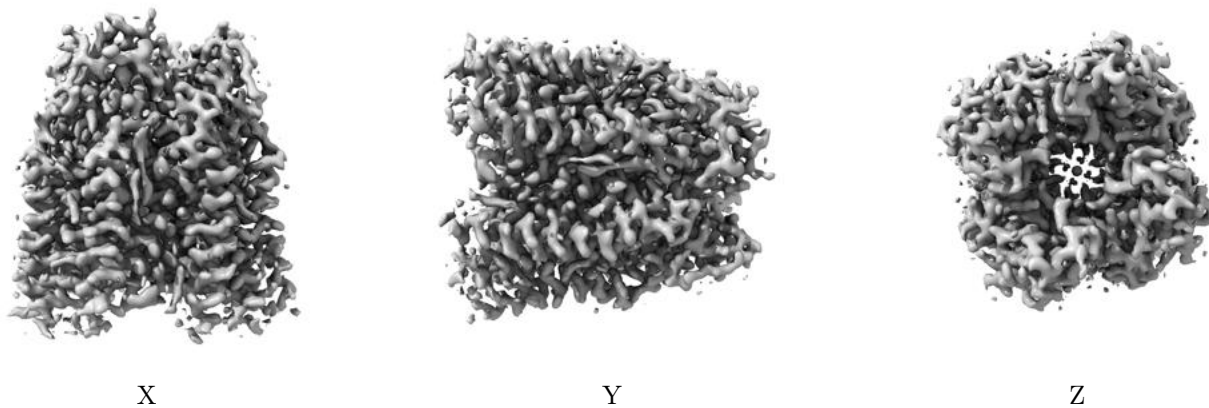


Z

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.

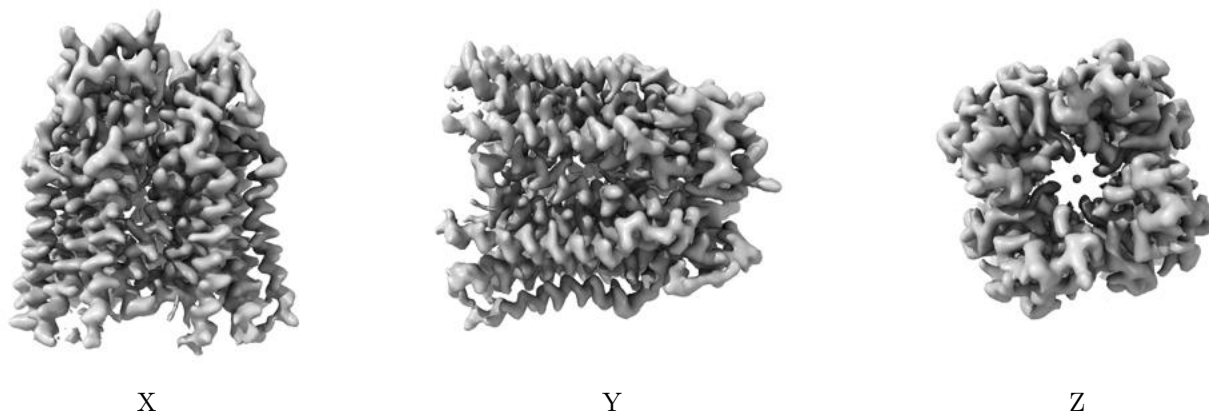
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.108. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



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

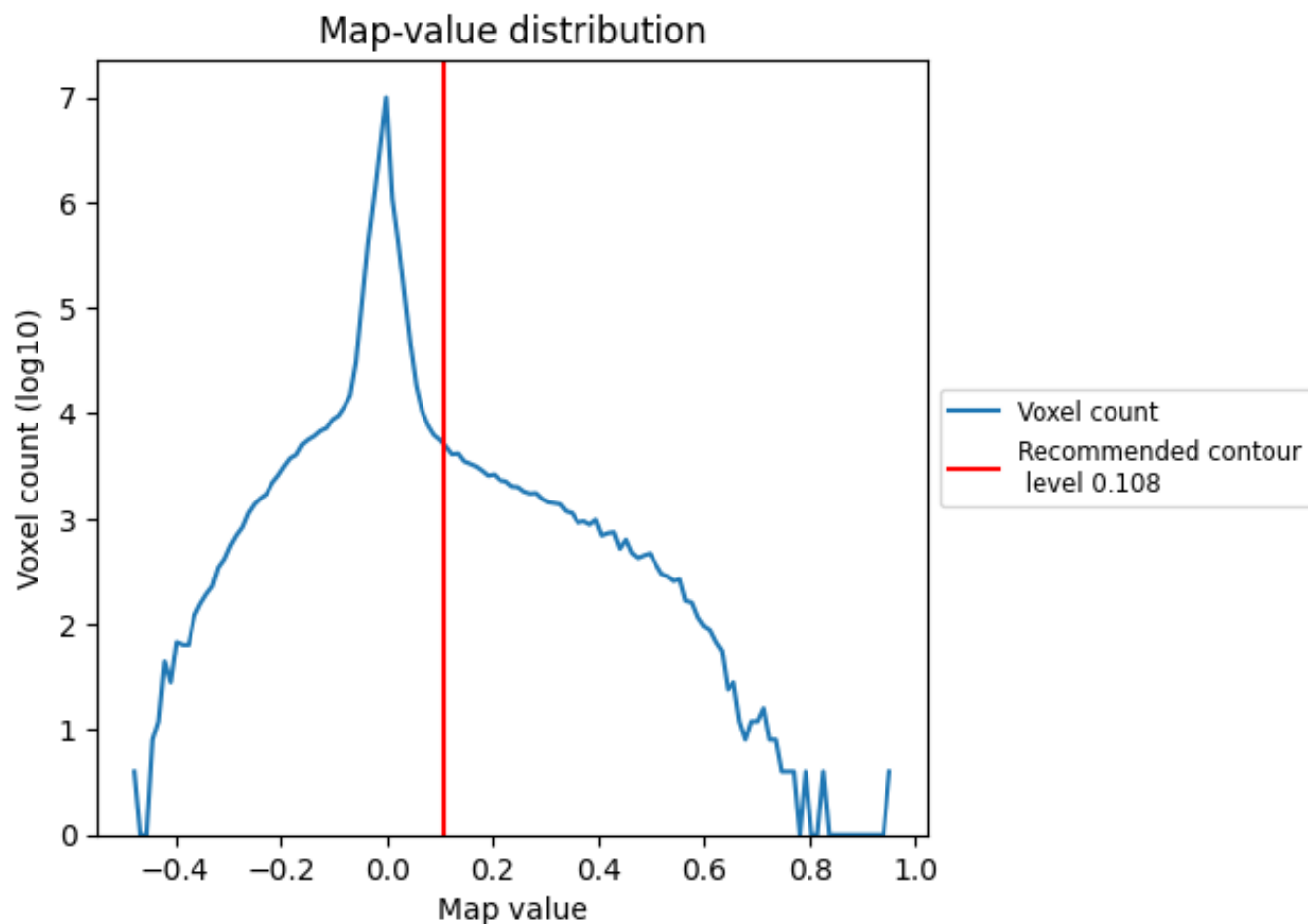
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

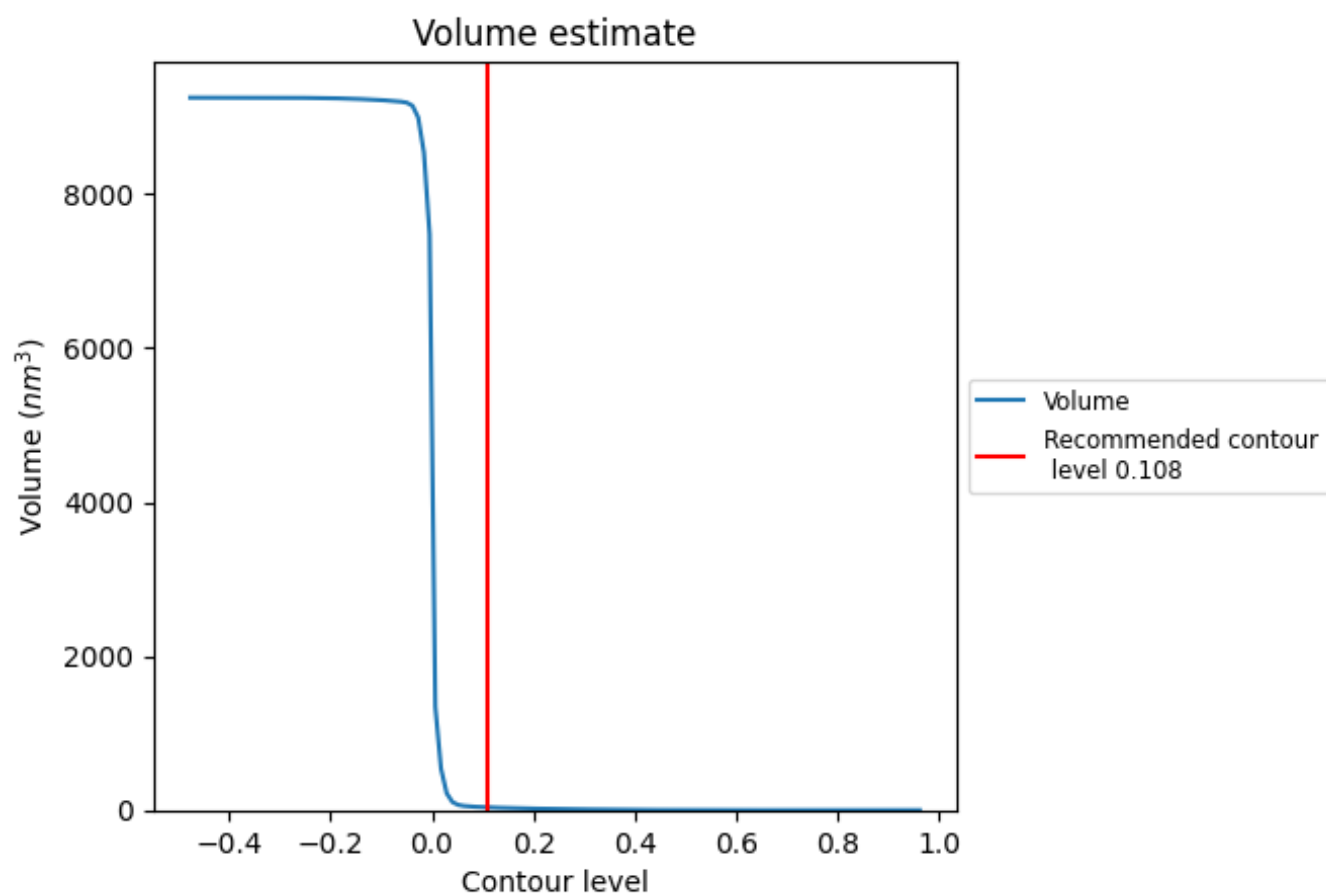
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

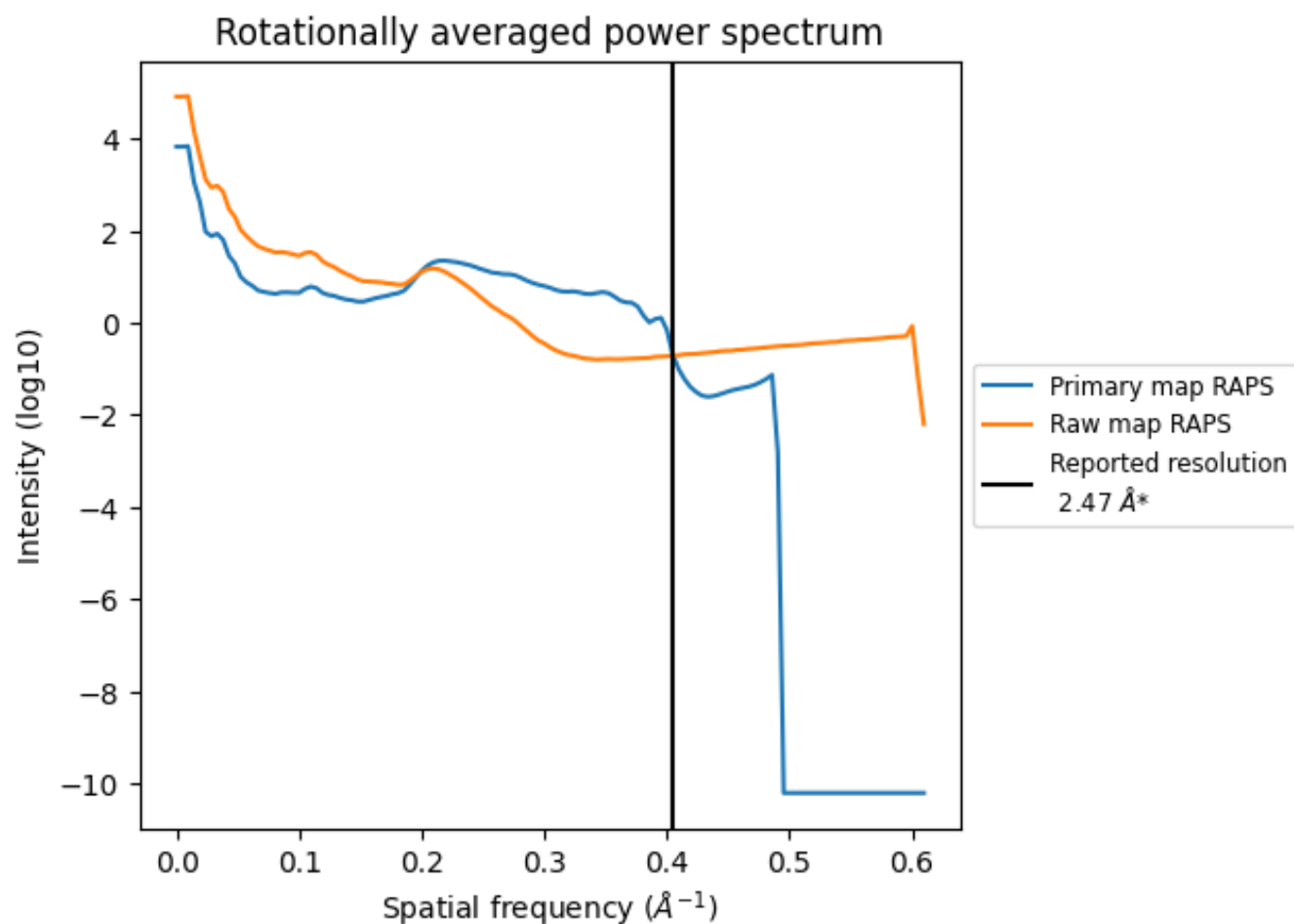
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 37 nm³; this corresponds to an approximate mass of 33 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 ⓘ

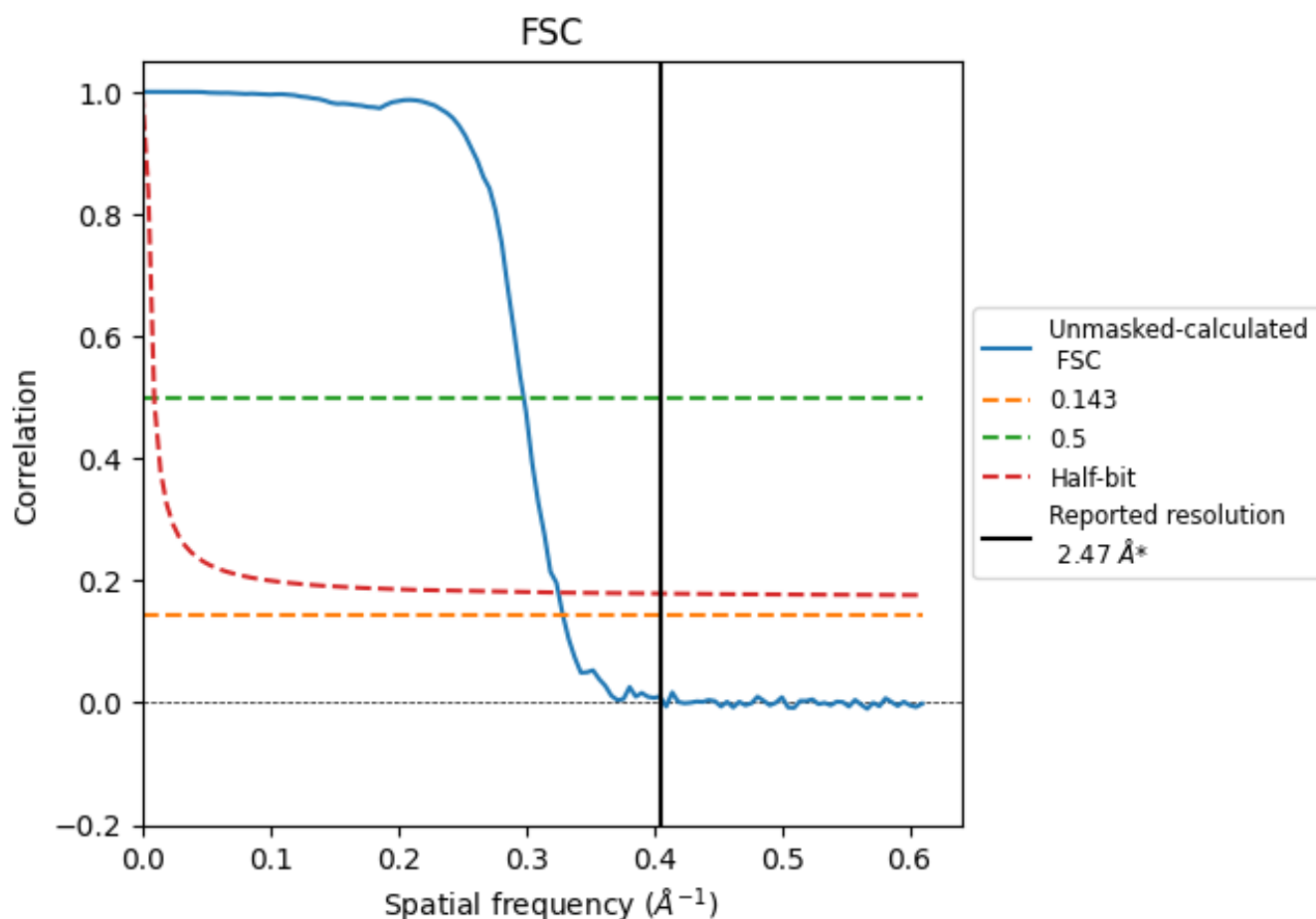


*Reported resolution corresponds to spatial frequency of 0.405 Å⁻¹

8 Fourier-Shell correlation [i](#)

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

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of $0.405 \text{ \AA}^{-1}$

8.2 Resolution estimates [i](#)

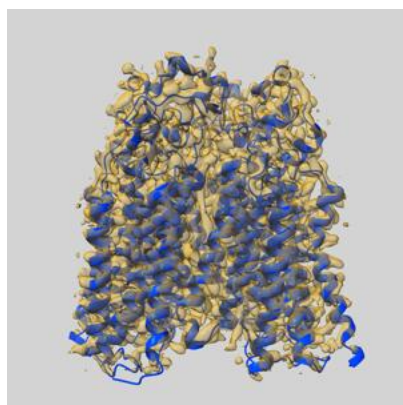
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.47	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	3.04	3.35	3.07

*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 3.04 differs from the reported value 2.47 by more than 10 %

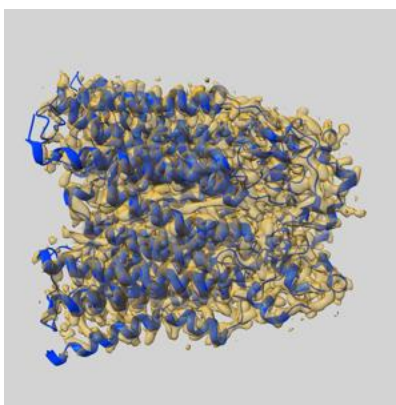
9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-62722 and PDB model 9LOS. Per-residue inclusion information can be found in section [3](#) on page [9](#).

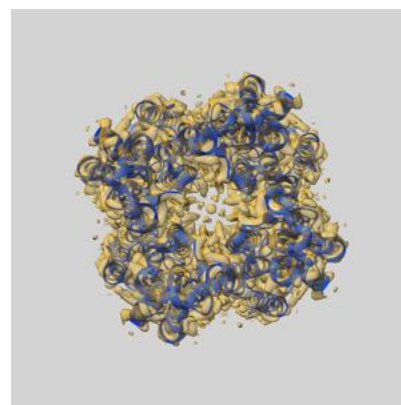
9.1 Map-model overlay [i](#)



X



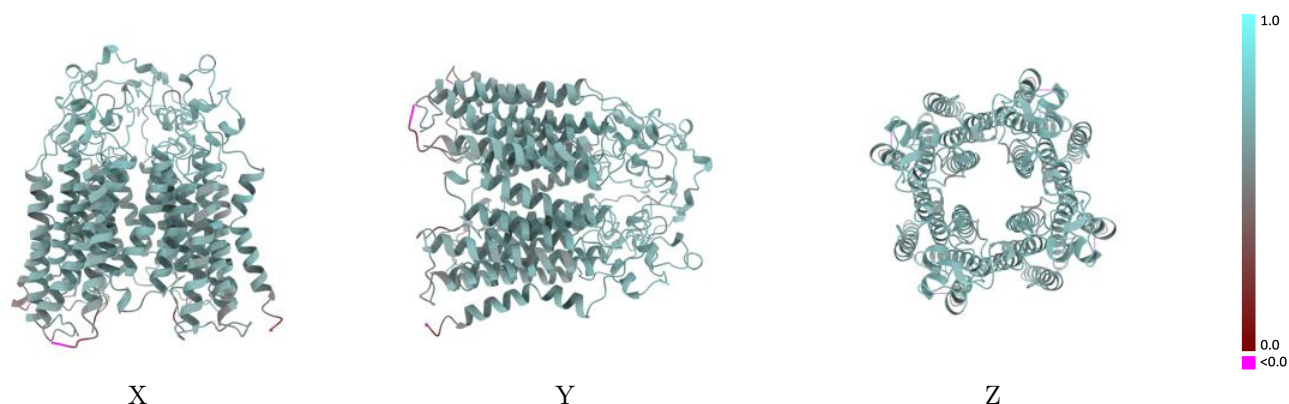
Y



Z

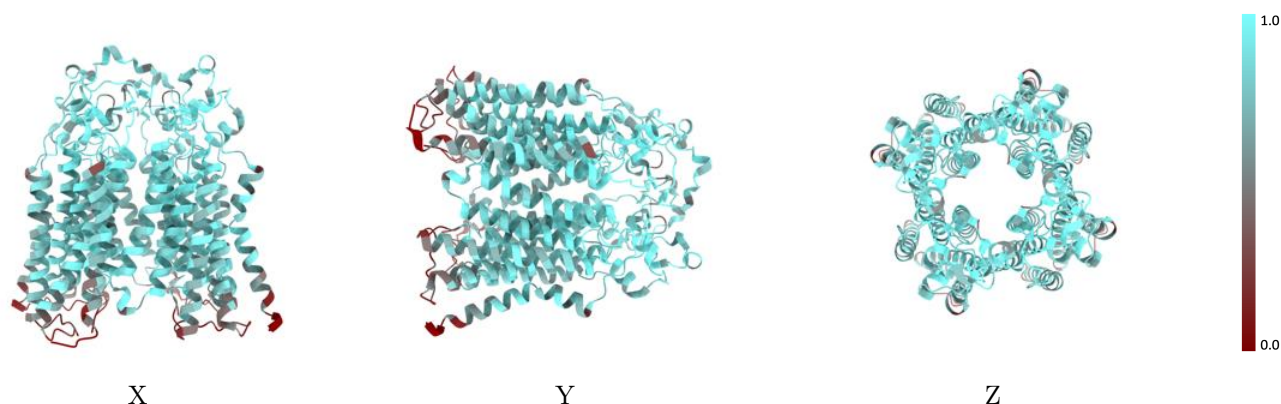
The images above show the 3D surface view of the map at the recommended contour level 0.108 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



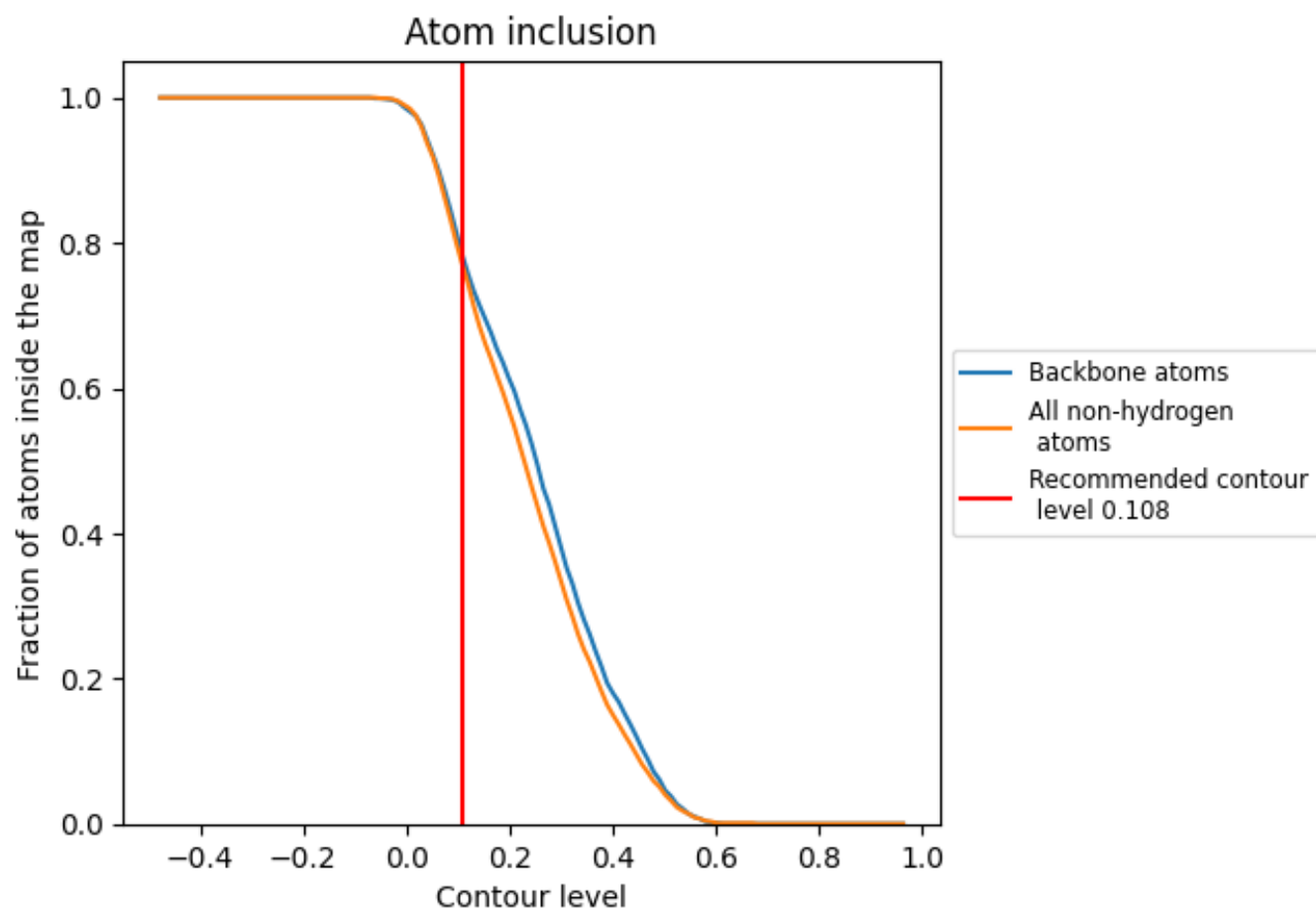
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.108).

9.4 Atom inclusion [i](#)



At the recommended contour level, 78% of all backbone atoms, 77% 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 (0.108) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7710	0.6120
A	0.7720	0.6110
B	0.7750	0.6110
C	0.7760	0.6110
D	0.7750	0.6120

