



Full wwPDB EM Validation Report ⓘ

Sep 25, 2025 – 04:31 PM EDT

PDB ID : 9NUZ / pdb_00009nuz
EMDB ID : EMD-49824
Title : Y20S after Mg²⁺ (Sec18) - Class 4
Authors : Khan, Y.A.; Brunger, A.T.
Deposited on : 2025-03-20
Resolution : 3.18 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:

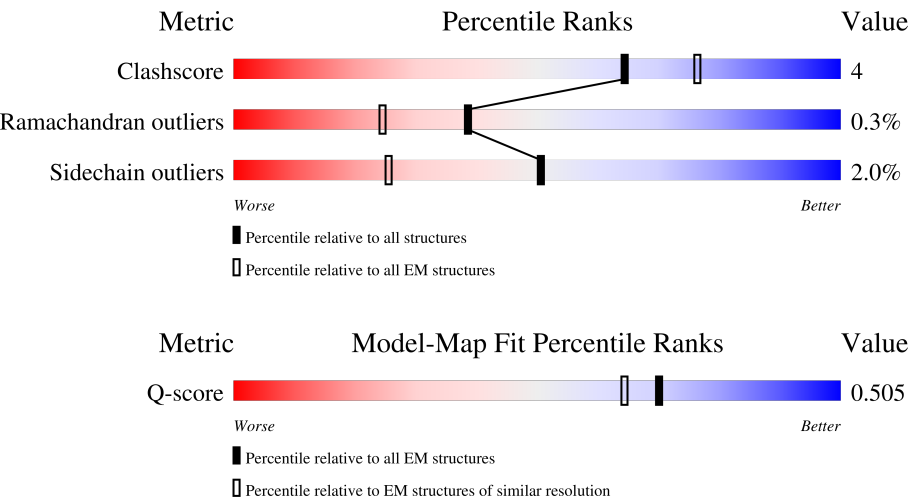
EMDB validation analysis : 0.0.1.dev129
Mogul : 2022.3.0, CSD as543be (2022)
MolProbity : 4-5-2 with Phenix2.0
buster-report : 1.1.7 (2018)
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.46

1 Overall quality at a glance i

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

The reported resolution of this entry is 3.18 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	14470 (2.68 - 3.68)

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	761	58%7%•34%
1	B	761	59%6%•34%
1	C	761	59%7%34%
1	D	761	60%5%34%

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Mol	Chain	Length	Quality of chain
1	E	761	 60%6%34%
1	F	761	 60%6%34%
1	G	761	 58%7%34%

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 56052 atoms, of which 28189 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 Vesicular-fusion protein SEC18.

Mol	Chain	Residues	Atoms						AltConf	Trace
1	A	502	Total	C	H	N	O	S	0	0
			7910	2463	4003	675	751	18		
1	B	502	Total	C	H	N	O	S	0	0
			7910	2463	4003	675	751	18		
1	C	502	Total	C	H	N	O	S	0	0
			7910	2463	4003	675	751	18		
1	D	502	Total	C	H	N	O	S	0	0
			7910	2463	4003	675	751	18		
1	E	502	Total	C	H	N	O	S	0	0
			7910	2463	4003	675	751	18		
1	F	502	Total	C	H	N	O	S	0	0
			7910	2463	4003	675	751	18		
1	G	502	Total	C	H	N	O	S	0	0
			7910	2463	4003	675	751	18		

There are 21 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-2	GLY	-	expression tag	UNP P18759
A	-1	ALA	-	expression tag	UNP P18759
A	0	HIS	-	expression tag	UNP P18759
B	-2	GLY	-	expression tag	UNP P18759
B	-1	ALA	-	expression tag	UNP P18759
B	0	HIS	-	expression tag	UNP P18759
C	-2	GLY	-	expression tag	UNP P18759
C	-1	ALA	-	expression tag	UNP P18759
C	0	HIS	-	expression tag	UNP P18759
D	-2	GLY	-	expression tag	UNP P18759
D	-1	ALA	-	expression tag	UNP P18759
D	0	HIS	-	expression tag	UNP P18759
E	-2	GLY	-	expression tag	UNP P18759
E	-1	ALA	-	expression tag	UNP P18759
E	0	HIS	-	expression tag	UNP P18759
F	-2	GLY	-	expression tag	UNP P18759

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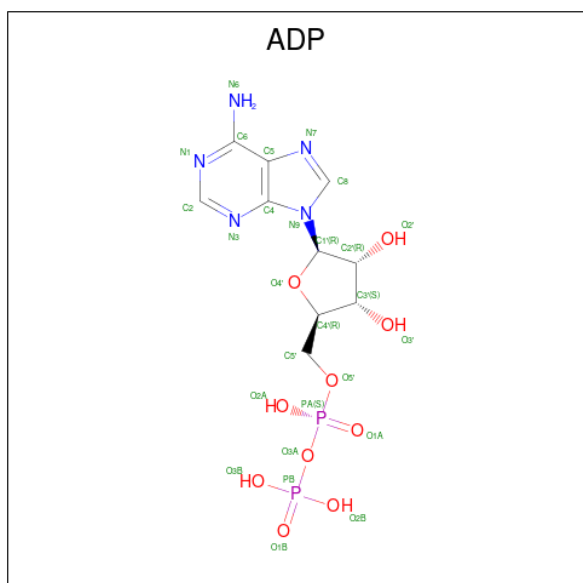
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Chain	Residue	Modelled	Actual	Comment	Reference
F	-1	ALA	-	expression tag	UNP P18759
F	0	HIS	-	expression tag	UNP P18759
G	-2	GLY	-	expression tag	UNP P18759
G	-1	ALA	-	expression tag	UNP P18759
G	0	HIS	-	expression tag	UNP P18759

- Molecule 2 is MAGNESIUM ION (CCD ID: MG) (formula: Mg) (labeled as "Ligand of Interest" by depositor).

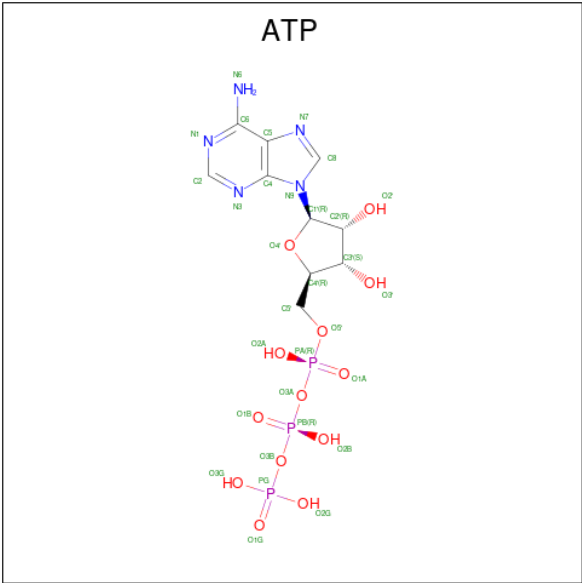
Mol	Chain	Residues	Atoms	AltConf
2	A	1	Total Mg 1 1	0
2	B	1	Total Mg 1 1	0
2	C	1	Total Mg 1 1	0
2	D	1	Total Mg 1 1	0
2	E	1	Total Mg 1 1	0
2	F	1	Total Mg 1 1	0
2	G	1	Total Mg 1 1	0

- Molecule 3 is ADENOSINE-5'-DIPHOSPHATE (CCD ID: ADP) (formula: C₁₀H₁₅N₅O₁₀P₂) (labeled as "Ligand of Interest" by depositor).



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

- Molecule 4 is ADENOSINE-5'-TRIPHOSPHATE (CCD ID: ATP) (formula: C₁₀H₁₆N₅O₁₃P₃) (labeled as "Ligand of Interest" by depositor).



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Mol	Chain	Residues	Atoms						AltConf
4	E	1	Total	C	H	N	O	P	0
			43	10	12	5	13	3	
4	F	1	Total	C	H	N	O	P	0
			43	10	12	5	13	3	
4	G	1	Total	C	H	N	O	P	0
			43	10	12	5	13	3	

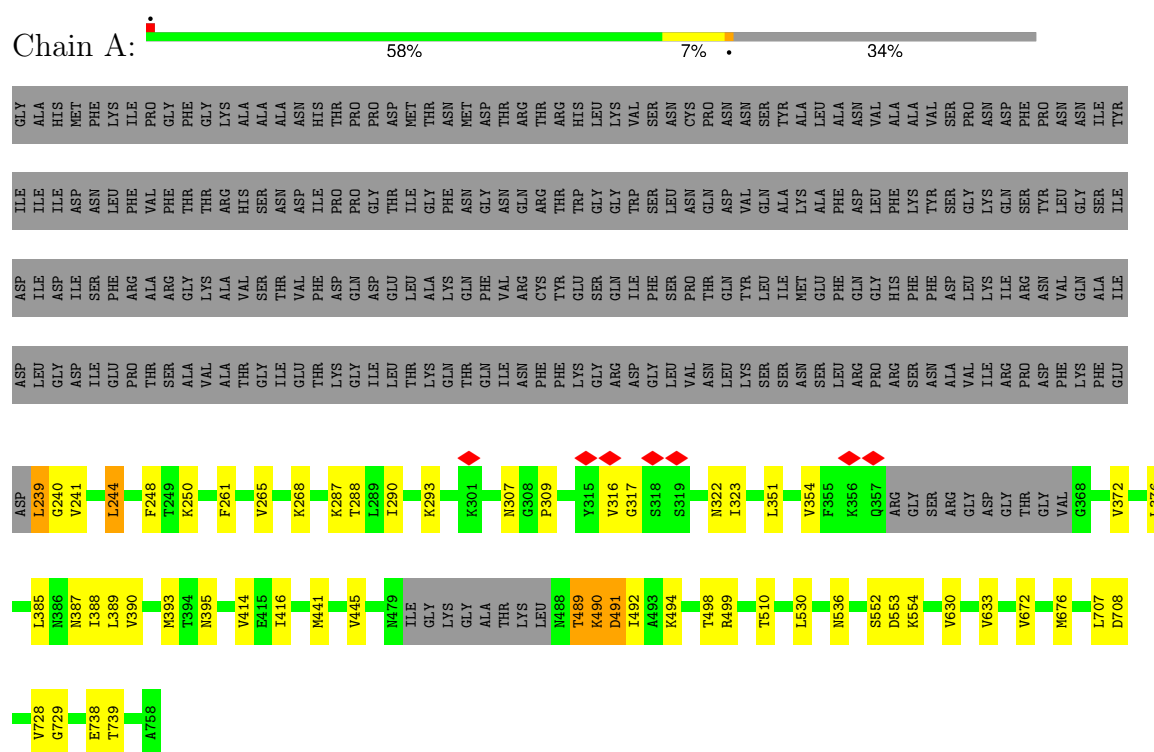
- Molecule 5 is water.

Mol	Chain	Residues	Atoms		AltConf
5	A	22	Total	O	0
			22	22	
5	B	19	Total	O	0
			19	19	
5	C	12	Total	O	0
			12	12	
5	D	13	Total	O	0
			13	13	
5	E	10	Total	O	0
			10	10	
5	F	15	Total	O	0
			15	15	
5	G	10	Total	O	0
			10	10	

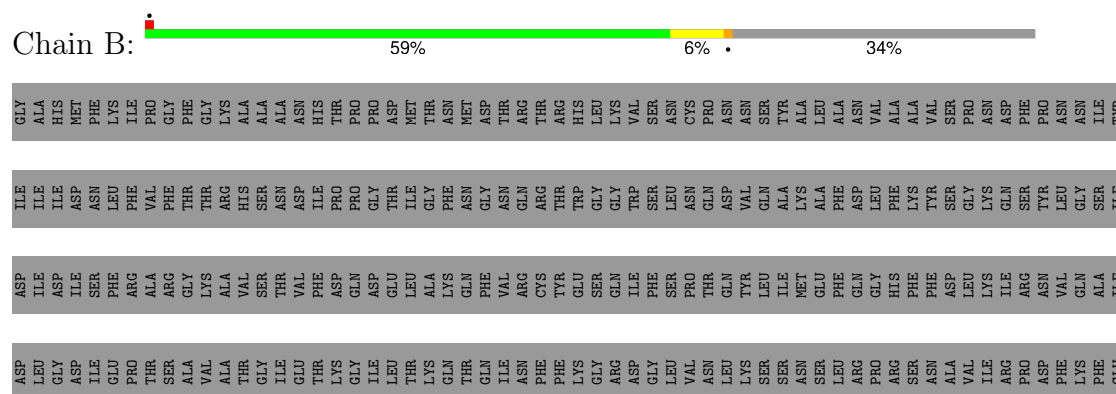
3 Residue-property plots

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: Vesicular-fusion protein SEC18

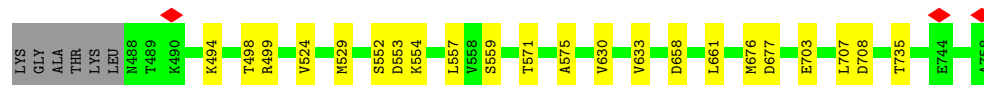
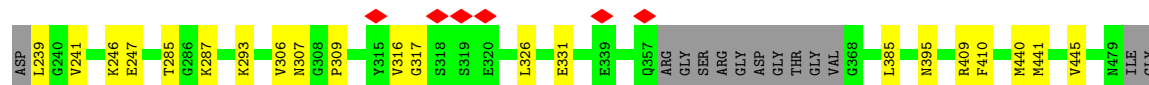
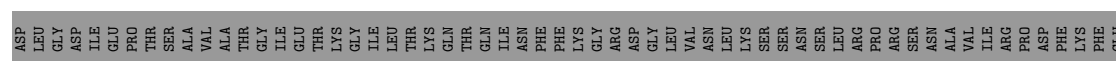
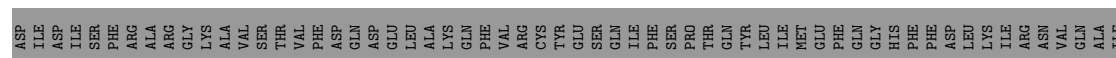


• Molecule 1: Vesicular-fusion protein SEC18

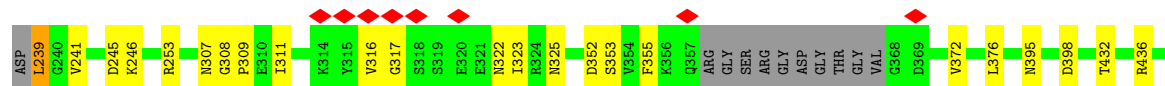
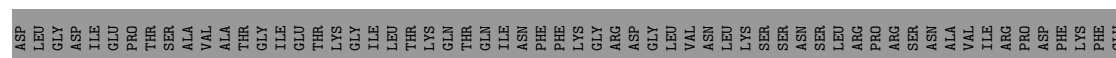
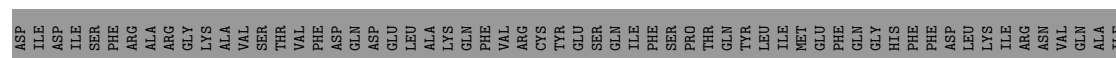
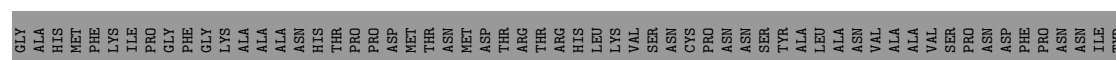




• Molecule 1: Vesicular-fusion protein SEC18



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• Molecule 1: Vesicular-fusion protein SEC18

Response	Percentage
Yes	58%
No	7%
Don't know	34%

ASP	LEU	GLY	ASP	ILE	GLU	PRO	THR	SER	ALA	VAL	ALA	THR	GLY	ILE	GLU	THR	LYS	GLY	ILE	LEU	THR	THR	LYS	GLN	THR	GLN	ILE	ILE	PHE	PHE	LYS	GLY	ARG	ASP	GLY	LEU	VAL	ASN	LEU	SER	SER	ASN	LEU	ARG	PRO	ARG	SER	ALA	VAL	ILE	ARG	PRO	ASP	PHE	LYS	PHE	GLU
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M393	D398	L399	R409	F410	K423	R436	M441	V445	F472	L479	I48	GLY	LYS	GLY	ALA	THR	LYS	LEU	K490	V524	L530	M536	G542	V546	R550	E551	S552	D553	K554	E599	I603	S616	M619	L626	V630
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Q657	D658	M676	D677	D708	T735	T739	A758
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4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	96291	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	-800	Depositor
Maximum defocus (nm)	-1800	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	3.282	Depositor
Minimum map value	-1.574	Depositor
Average map value	0.006	Depositor
Map value standard deviation	0.087	Depositor
Recommended contour level	0.313	Depositor
Map size ($\text{\AA}$)	322.4199, 322.4199, 322.4199	wwPDB
Map dimensions	330, 330, 330	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing ($\text{\AA}$)	0.97703, 0.97703, 0.97703	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: ATP, ADP, 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	0.20	0/3959	0.45	0/5337
1	B	0.23	0/3959	0.50	0/5337
1	C	0.21	0/3959	0.47	0/5337
1	D	0.21	0/3959	0.46	0/5337
1	E	0.20	0/3959	0.45	0/5337
1	F	0.20	0/3959	0.44	0/5337
1	G	0.20	0/3959	0.45	0/5337
All	All	0.21	0/27713	0.46	0/37359

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

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	3907	4003	4003	36	0
1	B	3907	4003	4003	36	0
1	C	3907	4003	4003	36	0
1	D	3907	4003	4003	26	0
1	E	3907	4003	4003	32	0
1	F	3907	4003	4003	28	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	G	3907	4003	4004	32	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
2	C	1	0	0	0	0
2	D	1	0	0	0	0
2	E	1	0	0	0	0
2	F	1	0	0	0	0
2	G	1	0	0	0	0
3	A	27	12	12	0	0
3	B	27	12	12	1	0
3	C	27	12	12	0	0
3	D	27	12	12	0	0
3	E	27	12	12	1	0
3	F	27	12	12	0	0
3	G	27	12	12	0	0
4	A	31	12	12	0	0
4	B	31	12	12	0	0
4	C	31	12	12	0	0
4	D	31	12	12	0	0
4	E	31	12	12	1	0
4	F	31	12	12	0	0
4	G	31	12	12	0	0
5	A	22	0	0	0	0
5	B	19	0	0	0	0
5	C	12	0	0	0	0
5	D	13	0	0	0	0
5	E	10	0	0	0	0
5	F	15	0	0	0	0
5	G	10	0	0	0	0
All	All	27863	28189	28190	220	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 4.

All (220) 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:B:239:LEU:HD21	1:B:293:LYS:HB3	1.65	0.79
1:C:351:LEU:O	1:C:354:VAL:HG22	1.87	0.74
1:B:489:THR:O	1:B:490:LYS:HB3	1.91	0.70
1:E:441:MET:HE2	1:E:445:VAL:HG21	1.74	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:701:MET:HE1	1:B:715:VAL:HG11	1.72	0.69
1:G:599:GLU:O	1:G:603:ILE:HD12	1.93	0.68
1:B:239:LEU:HD11	1:B:293:LYS:HD2	1.78	0.65
1:D:383:ASP:OD1	1:D:383:ASP:O	2.15	0.64
1:C:450:LEU:O	1:C:454:THR:HG22	1.96	0.64
1:C:250:LYS:NZ	1:C:414:VAL:HG22	2.15	0.61
1:C:383:ASP:OD1	1:C:383:ASP:O	2.19	0.59
1:B:672:VAL:HG12	1:B:676:MET:HE2	1.83	0.59
1:A:287:LYS:O	1:A:290:ILE:HG22	2.04	0.56
1:B:498:THR:HG22	1:B:499:ARG:H	1.70	0.56
1:C:454:THR:HG23	1:C:454:THR:O	2.04	0.56
1:C:549:VAL:HG12	1:C:549:VAL:O	2.04	0.56
1:C:241:VAL:CG1	1:C:244:LEU:HD12	2.36	0.56
1:C:617:PRO:C	1:C:618:LEU:HD12	2.31	0.56
1:A:250:LYS:NZ	1:A:414:VAL:HG22	2.21	0.55
1:A:385:LEU:HD23	1:A:387:ASN:H	1.72	0.55
1:C:747:VAL:O	1:C:751:VAL:HG23	2.07	0.55
1:C:354:VAL:HG23	1:C:355:PHE:CD2	2.41	0.55
1:E:239:LEU:HD11	1:E:293:LYS:HB3	1.89	0.54
1:E:707:LEU:HD12	1:E:708:ASP:O	2.07	0.53
1:G:542:GLY:O	1:G:546:VAL:HG23	2.08	0.53
1:C:676:MET:O	1:C:677:ASP:OD1	2.26	0.53
1:B:475:ASN:CG	1:B:475:ASN:O	2.52	0.53
1:A:489:THR:O	1:A:490:LYS:C	2.51	0.53
1:B:435:MET:HE1	1:B:497:VAL:HG21	1.91	0.53
1:F:355:PHE:HE1	1:F:372:VAL:HG21	1.73	0.53
1:E:441:MET:HE2	1:E:445:VAL:CG2	2.37	0.53
1:G:735:THR:HG22	1:G:735:THR:O	2.09	0.53
1:A:385:LEU:HD22	1:A:388:ILE:HG23	1.91	0.52
1:A:389:LEU:HD23	1:A:390:VAL:N	2.25	0.52
1:C:250:LYS:HZ1	1:C:414:VAL:HG22	1.73	0.52
1:C:239:LEU:HD23	1:C:293:LYS:HG3	1.89	0.52
1:G:676:MET:O	1:G:677:ASP:OD1	2.27	0.52
1:C:352:ASP:OD1	1:C:353:SER:N	2.43	0.52
1:F:657:GLN:O	1:F:658:ASP:OD1	2.28	0.52
1:D:298:LEU:O	1:D:299:ASN:OD1	2.27	0.51
1:E:630:VAL:HG12	1:E:630:VAL:O	2.09	0.51
1:A:707:LEU:HD12	1:A:708:ASP:O	2.10	0.51
1:A:441:MET:CE	1:A:445:VAL:HG11	2.41	0.51
1:A:630:VAL:HG12	1:A:630:VAL:O	2.10	0.51
1:C:524:VAL:O	1:C:524:VAL:HG12	2.10	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:630:VAL:HG12	1:C:630:VAL:O	2.10	0.51
1:C:395:ASN:OD1	1:C:395:ASN:O	2.29	0.51
1:F:713:VAL:HG12	1:F:717:ASN:OD1	2.11	0.50
1:D:268:LYS:HG2	1:E:440:MET:HE1	1.94	0.50
1:G:616:SER:OG	1:G:619:ASN:OD1	2.29	0.50
1:C:316:VAL:HG13	1:C:317:GLY:N	2.26	0.50
1:A:490:LYS:O	1:A:491:ASP:HB2	2.12	0.50
1:C:239:LEU:HD23	1:C:293:LYS:CG	2.42	0.50
1:C:657:GLN:O	1:C:658:ASP:OD1	2.29	0.50
1:G:530:LEU:HD23	1:G:536:ASN:OD1	2.11	0.50
1:G:630:VAL:HG12	1:G:630:VAL:O	2.12	0.50
1:A:287:LYS:CB	1:A:393:MET:HE3	2.41	0.50
1:A:672:VAL:HG12	1:A:676:MET:HE3	1.93	0.49
1:E:524:VAL:HG12	1:E:524:VAL:O	2.12	0.49
1:C:285:THR:HG22	1:C:285:THR:O	2.12	0.49
1:B:676:MET:O	1:B:677:ASP:OD1	2.32	0.48
1:C:256:PHE:CE2	1:C:294:ILE:HG21	2.48	0.48
1:D:707:LEU:HD12	1:D:708:ASP:O	2.13	0.48
1:F:395:ASN:OD1	1:F:395:ASN:O	2.32	0.48
1:E:306:VAL:HG21	1:E:326:LEU:CD1	2.44	0.48
1:B:491:ASP:O	1:B:492:ILE:C	2.56	0.48
1:E:409:ARG:O	1:E:410:PHE:C	2.56	0.48
1:F:707:LEU:HD12	1:F:708:ASP:O	2.14	0.48
1:G:441:MET:CE	1:G:445:VAL:HG11	2.44	0.48
1:B:395:ASN:OD1	1:B:395:ASN:O	2.32	0.47
1:E:441:MET:CE	1:E:445:VAL:HG21	2.42	0.47
1:E:677:ASP:O	1:E:677:ASP:OD1	2.32	0.47
1:F:630:VAL:O	1:F:630:VAL:HG12	2.14	0.47
1:B:509:VAL:O	1:B:509:VAL:HG13	2.14	0.47
1:G:433:LYS:HA	1:G:436:ARG:HH21	1.79	0.47
1:E:316:VAL:HG13	1:E:317:GLY:N	2.30	0.47
1:E:633:VAL:HG13	1:E:633:VAL:O	2.14	0.47
1:B:491:ASP:C	1:B:493:ALA:N	2.72	0.47
1:A:287:LYS:HB3	1:A:393:MET:HE3	1.96	0.47
1:B:316:VAL:HG13	1:B:317:GLY:N	2.29	0.47
1:B:432:THR:HB	1:B:441:MET:HE1	1.95	0.47
1:D:630:VAL:HG12	1:D:630:VAL:O	2.15	0.47
1:E:676:MET:O	1:E:677:ASP:OD1	2.31	0.47
1:E:494:LYS:O	1:E:494:LYS:HG2	2.15	0.47
1:F:308:GLY:O	1:F:311:ILE:HG22	2.15	0.47
1:B:630:VAL:HG12	1:B:630:VAL:O	2.14	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:250:LYS:HZ2	1:A:414:VAL:HG22	1.79	0.46
1:B:495:LEU:HD12	1:B:495:LEU:C	2.39	0.46
1:C:253:ARG:CZ	1:D:472:PHE:HE1	2.28	0.46
1:D:239:LEU:HD21	1:D:293:LYS:HB3	1.97	0.46
1:G:351:LEU:O	1:G:354:VAL:HG22	2.15	0.46
1:G:256:PHE:CE1	1:G:294:ILE:HG21	2.49	0.46
1:A:530:LEU:HD23	1:A:536:ASN:ND2	2.30	0.46
1:A:239:LEU:C	1:A:239:LEU:HD12	2.41	0.46
1:E:658:ASP:OD1	1:E:658:ASP:O	2.34	0.46
1:G:307:ASN:OD1	1:G:309:PRO:HD2	2.15	0.46
1:F:239:LEU:C	1:F:239:LEU:HD12	2.39	0.46
1:F:603:ILE:HG23	1:F:646:MET:HE3	1.98	0.46
1:D:409:ARG:O	1:D:410:PHE:C	2.59	0.46
1:G:550:ARG:O	1:G:550:ARG:HG2	2.16	0.46
1:C:385:LEU:HD23	1:C:387:ASN:H	1.80	0.45
1:D:285:THR:HG22	1:D:285:THR:O	2.16	0.45
1:D:316:VAL:HG13	1:D:317:GLY:N	2.30	0.45
1:G:708:ASP:OD1	1:G:708:ASP:C	2.59	0.45
1:F:322:ASN:O	1:F:325:ASN:OD1	2.34	0.45
1:F:524:VAL:HG12	1:F:524:VAL:O	2.16	0.45
1:G:385:LEU:HD23	1:G:387:ASN:H	1.80	0.45
1:B:435:MET:CE	1:B:497:VAL:HG21	2.47	0.45
1:D:248:PHE:O	1:D:249:THR:C	2.59	0.45
1:G:316:VAL:HG13	1:G:317:GLY:N	2.31	0.45
1:A:307:ASN:OD1	1:A:309:PRO:HD2	2.16	0.45
1:B:239:LEU:C	1:B:239:LEU:HD12	2.41	0.45
1:E:735:THR:O	1:E:735:THR:HG22	2.17	0.45
1:F:322:ASN:OD1	1:F:323:ILE:N	2.49	0.45
1:A:728:VAL:HG12	1:A:729:GLY:O	2.17	0.45
1:D:633:VAL:O	1:D:633:VAL:HG13	2.17	0.45
1:C:694:LEU:HD23	1:C:726:PHE:HE1	1.80	0.45
1:D:248:PHE:CE2	1:D:294:ILE:HD11	2.51	0.45
1:A:261:PHE:HD2	1:A:265:VAL:HG11	1.82	0.45
1:F:748:ASN:HA	1:F:751:VAL:HG12	1.98	0.45
1:G:398:ASP:OD1	1:G:399:LEU:HD12	2.17	0.44
1:F:509:VAL:HG13	1:F:509:VAL:O	2.18	0.44
1:G:248:PHE:CE2	1:G:294:ILE:HD11	2.53	0.44
1:E:498:THR:HG22	1:E:499:ARG:N	2.32	0.44
1:D:713:VAL:HG12	1:D:717:ASN:OD1	2.17	0.44
1:F:607:ASP:OD2	1:F:611:ARG:NE	2.50	0.44
1:G:658:ASP:OD1	1:G:658:ASP:C	2.60	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:490:LYS:O	1:D:491:ASP:OD1	2.35	0.44
1:D:524:VAL:HG12	1:D:524:VAL:O	2.17	0.44
1:F:245:ASP:OD1	1:F:246:LYS:N	2.51	0.44
1:A:498:THR:HG22	1:A:499:ARG:N	2.33	0.44
1:F:718:GLU:OE1	1:F:751:VAL:HG21	2.18	0.44
1:C:261:PHE:CE2	1:D:474:ILE:CG2	3.01	0.44
1:E:557:LEU:CD1	1:E:661:LEU:HD21	2.48	0.44
1:B:405:LEU:HD12	1:B:405:LEU:N	2.33	0.43
1:C:490:LYS:O	1:C:491:ASP:OD1	2.36	0.43
1:B:347:ILE:HG23	1:B:393:MET:HE3	2.00	0.43
1:C:445:VAL:O	1:C:445:VAL:HG13	2.17	0.43
1:E:306:VAL:HG21	1:E:326:LEU:HD11	2.00	0.43
1:B:268:LYS:HE2	1:C:438:ASN:CG	2.44	0.43
1:D:245:ASP:O	1:D:246:LYS:C	2.61	0.43
1:B:432:THR:OG1	1:B:436:ARG:NH1	2.52	0.43
1:B:443:ASP:OD1	1:B:443:ASP:O	2.36	0.43
1:F:352:ASP:OD1	1:F:353:SER:N	2.52	0.43
1:C:626:LEU:O	1:C:626:LEU:HD23	2.19	0.43
1:E:285:THR:O	1:E:285:THR:HG22	2.17	0.43
1:F:307:ASN:OD1	1:F:309:PRO:HD2	2.18	0.43
1:A:633:VAL:O	1:A:633:VAL:HG13	2.17	0.43
1:A:316:VAL:HG13	1:A:317:GLY:N	2.33	0.43
1:E:529:MET:HE3	1:E:703:GLU:HB3	2.01	0.43
1:E:529:MET:HG2	4:E:903:ATP:N7	2.34	0.43
1:G:347:ILE:CG2	1:G:393:MET:HE2	2.49	0.43
1:D:256:PHE:CE2	1:D:294:ILE:HG21	2.54	0.42
1:E:395:ASN:OD1	1:E:395:ASN:O	2.37	0.42
1:G:285:THR:O	1:G:285:THR:HG22	2.18	0.42
1:B:626:LEU:C	1:B:626:LEU:HD23	2.43	0.42
1:D:510:THR:O	1:D:510:THR:HG23	2.20	0.42
1:F:432:THR:OG1	1:F:436:ARG:NH1	2.52	0.42
1:B:285:THR:O	1:B:285:THR:HG22	2.19	0.42
1:B:490:LYS:HB3	1:B:490:LYS:HE3	1.79	0.42
1:C:626:LEU:HD23	1:C:626:LEU:C	2.44	0.42
1:F:398:ASP:OD1	1:F:398:ASP:C	2.62	0.42
1:A:351:LEU:O	1:A:354:VAL:HG22	2.19	0.42
1:D:709:ASP:O	1:D:713:VAL:HG23	2.19	0.42
1:A:244:LEU:HD13	1:A:416:ILE:HD12	2.00	0.42
1:E:307:ASN:OD1	1:E:309:PRO:HD2	2.18	0.42
1:A:288:THR:OG1	1:A:393:MET:HE1	2.19	0.42
1:A:268:LYS:HG2	1:B:440:MET:HE1	2.01	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:630:VAL:HG12	1:D:639:PHE:HB2	2.02	0.42
1:G:657:GLN:O	1:G:658:ASP:OD1	2.37	0.42
1:A:322:ASN:OD1	1:A:323:ILE:N	2.53	0.42
1:B:322:ASN:OD1	1:B:323:ILE:N	2.52	0.42
1:F:735:THR:HG22	1:F:735:THR:O	2.19	0.42
1:G:354:VAL:HG23	1:G:355:PHE:CD1	2.55	0.42
1:B:245:ASP:OD1	1:B:246:LYS:N	2.53	0.42
1:B:389:LEU:HD23	1:B:390:VAL:N	2.35	0.42
1:D:559:SER:C	1:D:560:LEU:HD12	2.45	0.42
1:A:510:THR:HG23	1:A:510:THR:O	2.18	0.41
1:C:383:ASP:O	1:C:383:ASP:CG	2.63	0.41
1:C:409:ARG:O	1:C:410:PHE:C	2.63	0.41
1:G:292:ARG:HH22	1:G:305:ILE:HD11	1.85	0.41
1:G:385:LEU:HD22	1:G:388:ILE:HG23	2.01	0.41
1:G:524:VAL:HG12	1:G:524:VAL:O	2.20	0.41
1:A:385:LEU:CD2	1:A:388:ILE:HG23	2.50	0.41
1:A:441:MET:HE3	1:A:445:VAL:HG11	2.02	0.41
1:B:445:VAL:O	1:B:445:VAL:HG13	2.19	0.41
1:B:476:LYS:NZ	1:B:476:LYS:HB2	2.36	0.41
1:C:538:ILE:HG21	1:C:573:LEU:HD13	2.02	0.41
1:E:677:ASP:OD1	1:E:677:ASP:C	2.63	0.41
1:F:316:VAL:HG13	1:F:317:GLY:N	2.34	0.41
1:A:268:LYS:CG	1:B:440:MET:HE1	2.51	0.41
1:E:524:VAL:HG11	1:E:575:ALA:HB2	2.01	0.41
1:G:409:ARG:O	1:G:410:PHE:C	2.62	0.41
1:A:372:VAL:O	1:A:376:LEU:HD13	2.21	0.41
1:A:395:ASN:O	1:A:395:ASN:OD1	2.39	0.41
1:F:616:SER:OG	1:F:619:ASN:OD1	2.37	0.41
1:A:239:LEU:HD21	1:A:293:LYS:HB3	2.03	0.41
1:D:246:LYS:O	1:D:247:GLU:C	2.62	0.41
1:D:445:VAL:HG23	1:D:445:VAL:O	2.21	0.41
1:G:349:ASP:OD1	1:G:350:GLU:N	2.53	0.41
1:D:325:ASN:OD1	1:D:325:ASN:C	2.64	0.41
1:E:524:VAL:O	1:E:524:VAL:CG1	2.69	0.41
1:E:557:LEU:HD13	1:E:661:LEU:HD21	2.03	0.41
1:F:623:ILE:O	1:F:665:THR:HA	2.21	0.41
1:B:706:PHE:CD2	1:B:707:LEU:HG	2.55	0.41
1:C:478:VAL:O	1:C:479:ASN:C	2.63	0.41
1:C:693:ASN:HB2	1:C:696:GLU:OE1	2.21	0.41
1:E:326:LEU:HD23	1:E:326:LEU:C	2.46	0.41
1:F:372:VAL:O	1:F:376:LEU:HD13	2.21	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:B:902:ADP:O2A	3:B:902:ADP:O1B	2.38	0.41
1:E:287:LYS:HB2	3:E:902:ADP:O3B	2.20	0.41
1:E:331:GLU:HG2	1:E:385:LEU:HD11	2.01	0.41
1:F:705:ASN:OD1	1:F:705:ASN:O	2.39	0.40
1:A:239:LEU:HD12	1:A:239:LEU:O	2.21	0.40
1:A:287:LYS:HB2	1:A:393:MET:HE3	2.03	0.40
1:G:275:LYS:HE3	1:G:384:GLN:HE21	1.87	0.40
1:B:623:ILE:O	1:B:665:THR:HA	2.21	0.40
1:G:626:LEU:C	1:G:626:LEU:HD23	2.46	0.40
1:F:253:ARG:NH1	1:G:472:PHE:CE1	2.90	0.40
1:G:256:PHE:CZ	1:G:294:ILE:HG21	2.56	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	496/761 (65%)	469 (95%)	22 (4%)	5 (1%)	13	45
1	B	496/761 (65%)	471 (95%)	22 (4%)	3 (1%)	22	55
1	C	496/761 (65%)	471 (95%)	24 (5%)	1 (0%)	44	73
1	D	496/761 (65%)	469 (95%)	27 (5%)	0	100	100
1	E	496/761 (65%)	477 (96%)	19 (4%)	0	100	100
1	F	496/761 (65%)	475 (96%)	21 (4%)	0	100	100
1	G	496/761 (65%)	473 (95%)	22 (4%)	1 (0%)	44	73
All	All	3472/5327 (65%)	3305 (95%)	157 (4%)	10 (0%)	38	67

All (10) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	491	ASP
1	B	490	LYS
1	B	491	ASP
1	A	244	LEU
1	G	240	GLY
1	A	492	ILE
1	C	240	GLY
1	A	490	LYS
1	B	240	GLY
1	A	240	GLY

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	438/656 (67%)	428 (98%)	10 (2%)	45	70
1	B	438/656 (67%)	421 (96%)	17 (4%)	27	57
1	C	438/656 (67%)	433 (99%)	5 (1%)	70	84
1	D	438/656 (67%)	431 (98%)	7 (2%)	58	78
1	E	438/656 (67%)	430 (98%)	8 (2%)	54	75
1	F	438/656 (67%)	432 (99%)	6 (1%)	62	81
1	G	438/656 (67%)	431 (98%)	7 (2%)	58	78
All	All	3066/4592 (67%)	3006 (98%)	60 (2%)	50	73

All (60) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	239	LEU
1	A	241	VAL
1	A	248	PHE
1	A	489	THR
1	A	494	LYS
1	A	552	SER
1	A	553	ASP
1	A	554	LYS

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Mol	Chain	Res	Type
1	A	738	GLU
1	A	739	THR
1	B	239	LEU
1	B	241	VAL
1	B	475	ASN
1	B	476	LYS
1	B	488	ASN
1	B	490	LYS
1	B	491	ASP
1	B	492	ILE
1	B	495	LEU
1	B	498	THR
1	B	499	ARG
1	B	552	SER
1	B	553	ASP
1	B	554	LYS
1	B	707	LEU
1	B	751	VAL
1	B	753	LEU
1	C	246	LYS
1	C	247	GLU
1	C	530	LEU
1	C	553	ASP
1	C	554	LYS
1	D	241	VAL
1	D	249	THR
1	D	250	LYS
1	D	386	ASN
1	D	552	SER
1	D	553	ASP
1	D	554	LYS
1	E	241	VAL
1	E	246	LYS
1	E	247	GLU
1	E	552	SER
1	E	553	ASP
1	E	554	LYS
1	E	559	SER
1	E	571	THR
1	F	239	LEU
1	F	241	VAL
1	F	552	SER

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Mol	Chain	Res	Type
1	F	553	ASP
1	F	554	LYS
1	F	748	ASN
1	G	239	LEU
1	G	241	VAL
1	G	245	ASP
1	G	552	SER
1	G	553	ASP
1	G	554	LYS
1	G	739	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (17) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	273	HIS
1	A	413	GLN
1	B	370	ASN
1	B	395	ASN
1	C	370	ASN
1	C	548	GLN
1	C	563	HIS
1	D	307	ASN
1	E	426	GLN
1	E	563	HIS
1	E	717	ASN
1	F	374	GLN
1	F	479	ASN
1	G	374	GLN
1	G	384	GLN
1	G	413	GLN
1	G	439	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 21 ligands modelled in this entry, 7 are monoatomic - leaving 14 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
4	ATP	A	903	2	28,33,33	0.77	1 (3%)	34,52,52	0.99	2 (5%)
3	ADP	B	902	-	24,29,29	0.94	1 (4%)	29,45,45	1.09	2 (6%)
3	ADP	C	902	-	24,29,29	0.93	2 (8%)	29,45,45	1.12	2 (6%)
4	ATP	D	903	2	28,33,33	0.82	1 (3%)	34,52,52	0.73	1 (2%)
4	ATP	C	903	2	28,33,33	0.72	0	34,52,52	0.74	1 (2%)
4	ATP	G	903	2	28,33,33	0.81	0	34,52,52	0.93	2 (5%)
4	ATP	B	903	2	28,33,33	0.80	1 (3%)	34,52,52	0.92	2 (5%)
4	ATP	E	903	2	28,33,33	0.80	0	34,52,52	0.80	2 (5%)
4	ATP	F	903	2	28,33,33	0.78	0	34,52,52	0.75	1 (2%)
3	ADP	E	902	-	24,29,29	0.87	0	29,45,45	1.27	2 (6%)
3	ADP	A	902	-	24,29,29	0.99	2 (8%)	29,45,45	1.07	1 (3%)
3	ADP	G	902	-	24,29,29	0.85	0	29,45,45	1.26	2 (6%)
3	ADP	F	902	-	24,29,29	0.86	0	29,45,45	1.38	3 (10%)
3	ADP	D	902	-	24,29,29	0.96	1 (4%)	29,45,45	1.10	1 (3%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	ATP	A	903	2	-	5/18/38/38	0/3/3/3
3	ADP	B	902	-	-	5/12/32/32	0/3/3/3

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	ADP	C	902	-	-	2/12/32/32	0/3/3/3
4	ATP	D	903	2	-	3/18/38/38	0/3/3/3
4	ATP	C	903	2	-	2/18/38/38	0/3/3/3
4	ATP	G	903	2	-	6/18/38/38	0/3/3/3
4	ATP	B	903	2	-	3/18/38/38	0/3/3/3
4	ATP	E	903	2	-	4/18/38/38	0/3/3/3
4	ATP	F	903	2	-	7/18/38/38	0/3/3/3
3	ADP	E	902	-	-	7/12/32/32	0/3/3/3
3	ADP	A	902	-	-	10/12/32/32	0/3/3/3
3	ADP	G	902	-	-	6/12/32/32	0/3/3/3
3	ADP	F	902	-	-	5/12/32/32	0/3/3/3
3	ADP	D	902	-	-	5/12/32/32	0/3/3/3

All (9) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	D	903	ATP	PB-O3B	-2.52	1.56	1.59
3	A	902	ADP	PA-O3A	2.45	1.62	1.59
3	D	902	ADP	PA-O3A	2.36	1.62	1.59
3	A	902	ADP	O4'-C1'	2.35	1.44	1.40
3	B	902	ADP	PA-O3A	2.33	1.62	1.59
4	A	903	ATP	PG-O2G	-2.33	1.46	1.54
4	B	903	ATP	PB-O3B	-2.19	1.57	1.59
3	C	902	ADP	PA-O3A	2.05	1.61	1.59
3	C	902	ADP	O4'-C1'	2.02	1.43	1.40

All (24) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	E	902	ADP	N3-C2-N1	-4.28	122.87	128.67
3	F	902	ADP	N3-C2-N1	-4.26	122.88	128.67
3	G	902	ADP	N3-C2-N1	-4.13	123.06	128.67
3	C	902	ADP	N3-C2-N1	-4.03	123.20	128.67
3	D	902	ADP	N3-C2-N1	-4.02	123.22	128.67
3	B	902	ADP	N3-C2-N1	-3.87	123.42	128.67
3	A	902	ADP	N3-C2-N1	-3.70	123.64	128.67
4	G	903	ATP	C4'-O4'-C1'	-3.09	107.10	109.92
4	A	903	ATP	C4'-O4'-C1'	-2.96	107.22	109.92
4	B	903	ATP	C4'-O4'-C1'	-2.83	107.33	109.92

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	F	902	ADP	C4-C5-N7	-2.61	106.58	109.34
3	E	902	ADP	C4-C5-N7	-2.55	106.64	109.34
4	A	903	ATP	C5-C6-N6	2.43	124.02	120.31
4	G	903	ATP	C5-C6-N6	2.42	124.00	120.31
4	C	903	ATP	C5-C6-N6	2.42	124.00	120.31
4	F	903	ATP	C5-C6-N6	2.39	123.95	120.31
4	E	903	ATP	C5-C6-N6	2.38	123.93	120.31
3	G	902	ADP	C4-C5-N7	-2.32	106.88	109.34
4	B	903	ATP	C5-C6-N6	2.31	123.84	120.31
4	D	903	ATP	C5-C6-N6	2.28	123.79	120.31
3	B	902	ADP	C4-C5-N7	-2.24	106.97	109.34
3	C	902	ADP	C4-C5-N7	-2.14	107.08	109.34
3	F	902	ADP	O4'-C1'-N9	-2.11	105.95	108.75
4	E	903	ATP	O3A-PA-O1A	-2.07	104.47	110.70

There are no chirality outliers.

All (70) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	902	ADP	C5'-O5'-PA-O1A
3	A	902	ADP	C5'-O5'-PA-O3A
3	B	902	ADP	PA-O3A-PB-O2B
3	B	902	ADP	C5'-O5'-PA-O3A
3	C	902	ADP	C5'-O5'-PA-O3A
3	D	902	ADP	C5'-O5'-PA-O3A
3	E	902	ADP	C5'-O5'-PA-O2A
3	E	902	ADP	C5'-O5'-PA-O3A
3	E	902	ADP	O4'-C4'-C5'-O5'
3	F	902	ADP	C5'-O5'-PA-O2A
3	F	902	ADP	C5'-O5'-PA-O3A
3	G	902	ADP	C5'-O5'-PA-O2A
3	G	902	ADP	C5'-O5'-PA-O3A
3	G	902	ADP	O4'-C4'-C5'-O5'
4	C	903	ATP	PB-O3B-PG-O2G
4	E	903	ATP	C5'-O5'-PA-O2A
4	G	903	ATP	PB-O3B-PG-O3G
3	A	902	ADP	C3'-C4'-C5'-O5'
3	E	902	ADP	C3'-C4'-C5'-O5'
3	G	902	ADP	C3'-C4'-C5'-O5'
4	F	903	ATP	C3'-C4'-C5'-O5'
3	F	902	ADP	O4'-C4'-C5'-O5'
4	F	903	ATP	O4'-C4'-C5'-O5'

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Mol	Chain	Res	Type	Atoms
3	F	902	ADP	C3'-C4'-C5'-O5'
3	A	902	ADP	O4'-C4'-C5'-O5'
4	A	903	ATP	O4'-C4'-C5'-O5'
4	D	903	ATP	PA-O3A-PB-O1B
4	A	903	ATP	C3'-C4'-C5'-O5'
3	A	902	ADP	PA-O3A-PB-O1B
3	E	902	ADP	PA-O3A-PB-O1B
3	D	902	ADP	PA-O3A-PB-O3B
3	A	902	ADP	PB-O3A-PA-O1A
3	D	902	ADP	PB-O3A-PA-O2A
4	A	903	ATP	PA-O3A-PB-O2B
4	G	903	ATP	PA-O3A-PB-O2B
3	A	902	ADP	C5'-O5'-PA-O2A
3	B	902	ADP	C5'-O5'-PA-O1A
3	C	902	ADP	C5'-O5'-PA-O1A
3	D	902	ADP	C5'-O5'-PA-O1A
4	B	903	ATP	O4'-C4'-C5'-O5'
3	A	902	ADP	PB-O3A-PA-O2A
3	B	902	ADP	PB-O3A-PA-O2A
4	A	903	ATP	PA-O3A-PB-O1B
4	D	903	ATP	PA-O3A-PB-O2B
4	E	903	ATP	PA-O3A-PB-O2B
4	F	903	ATP	PA-O3A-PB-O1B
4	F	903	ATP	PA-O3A-PB-O2B
3	G	902	ADP	PA-O3A-PB-O1B
4	F	903	ATP	PB-O3B-PG-O1G
4	G	903	ATP	PB-O3B-PG-O1G
4	B	903	ATP	C3'-C4'-C5'-O5'
3	A	902	ADP	PA-O3A-PB-O2B
3	A	902	ADP	PA-O3A-PB-O3B
3	E	902	ADP	PA-O3A-PB-O2B
3	E	902	ADP	PA-O3A-PB-O3B
3	F	902	ADP	PA-O3A-PB-O3B
3	G	902	ADP	PA-O3A-PB-O2B
4	A	903	ATP	PB-O3B-PG-O2G
4	F	903	ATP	PB-O3B-PG-O2G
4	F	903	ATP	PB-O3B-PG-O3G
4	G	903	ATP	PB-O3B-PG-O2G
4	E	903	ATP	O4'-C4'-C5'-O5'
3	B	902	ADP	PB-O3A-PA-O1A
3	D	902	ADP	PB-O3A-PA-O1A
4	B	903	ATP	PA-O3A-PB-O2B

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Mol	Chain	Res	Type	Atoms
4	E	903	ATP	PA-O3A-PB-O1B
4	G	903	ATP	PA-O3A-PB-O1B
4	C	903	ATP	PB-O3B-PG-O1G
4	D	903	ATP	O4'-C4'-C5'-O5'
4	G	903	ATP	O4'-C4'-C5'-O5'

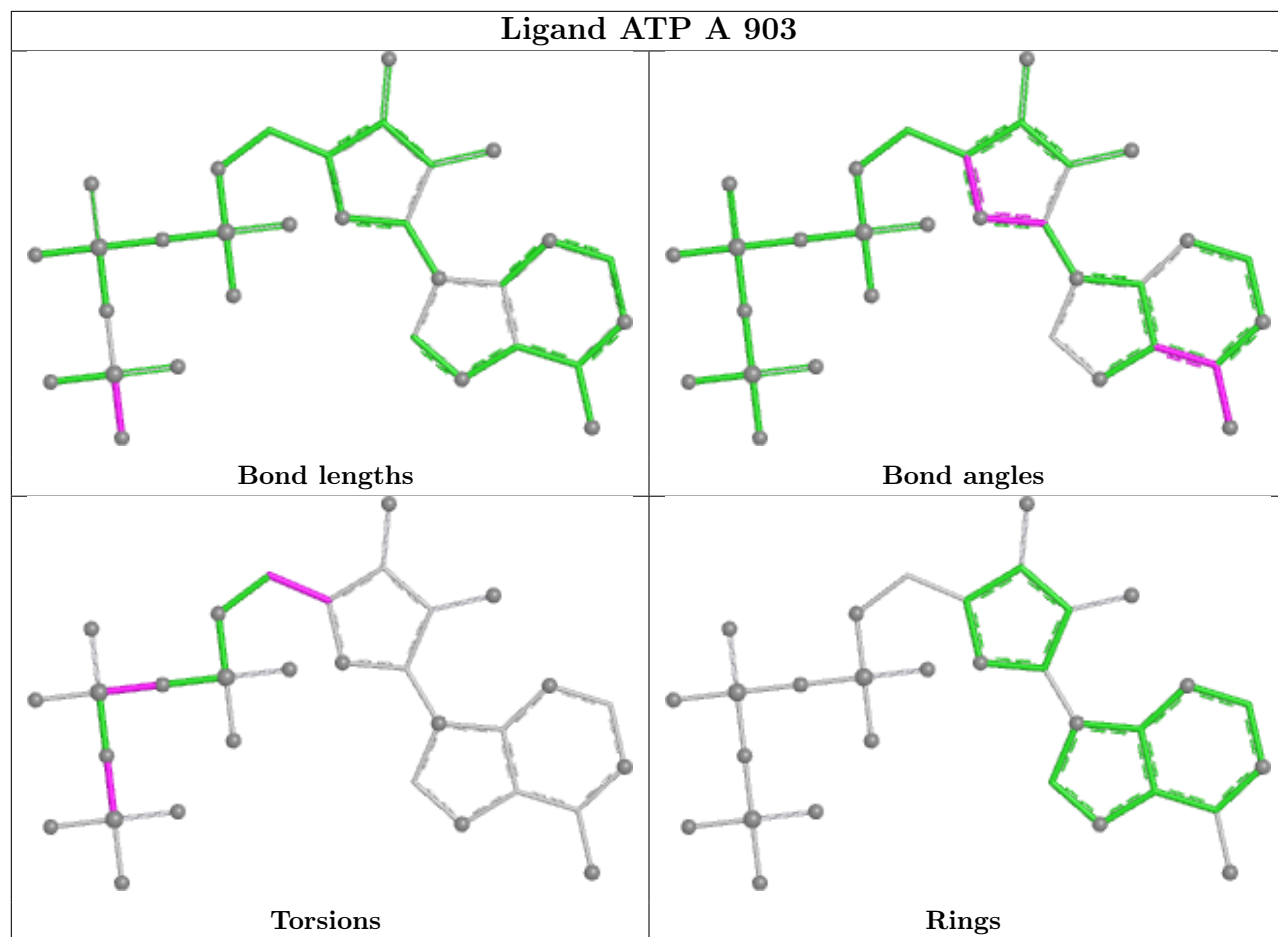
There are no ring outliers.

3 monomers are involved in 3 short contacts:

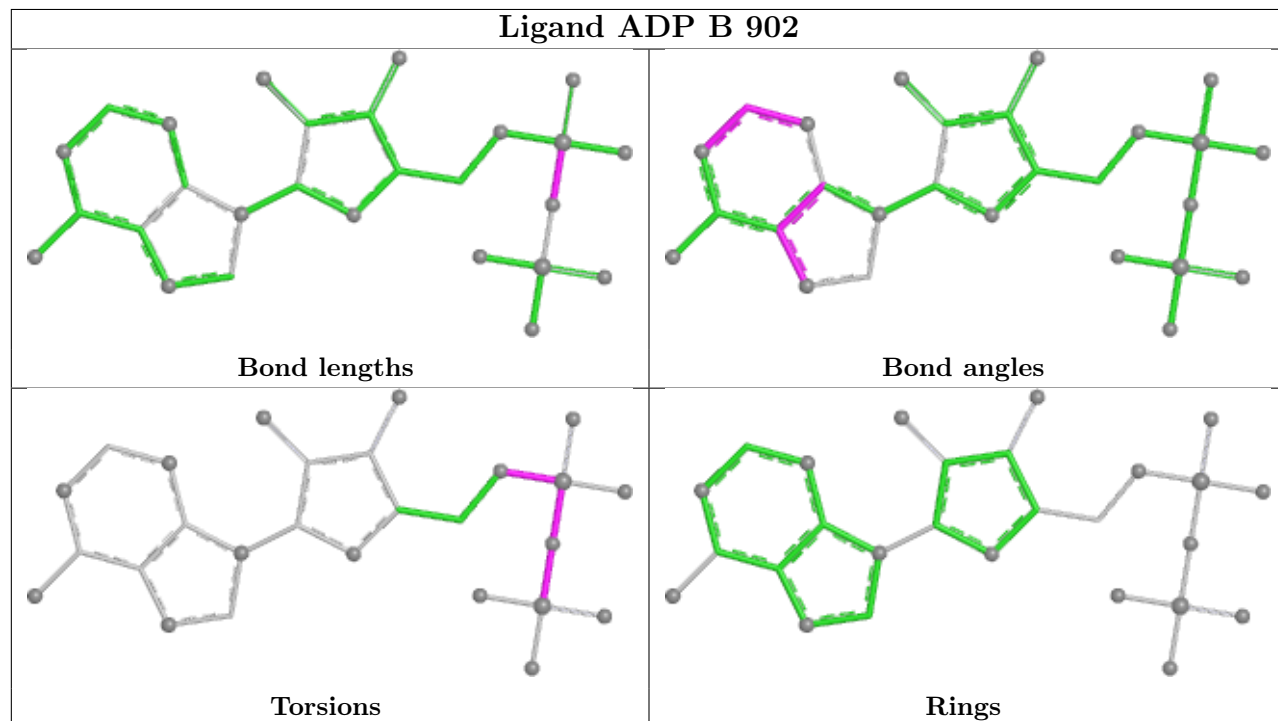
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	B	902	ADP	1	0
4	E	903	ATP	1	0
3	E	902	ADP	1	0

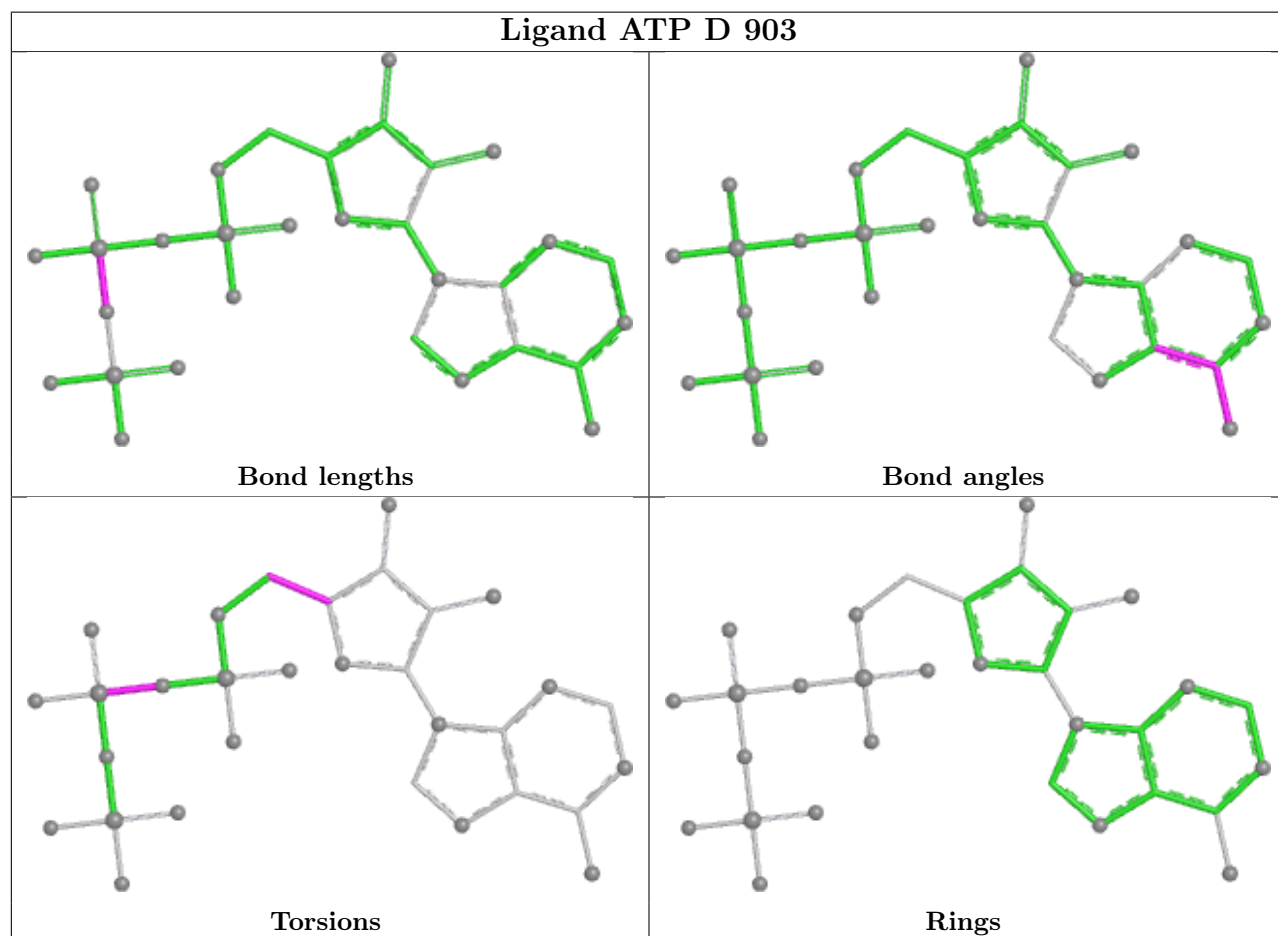
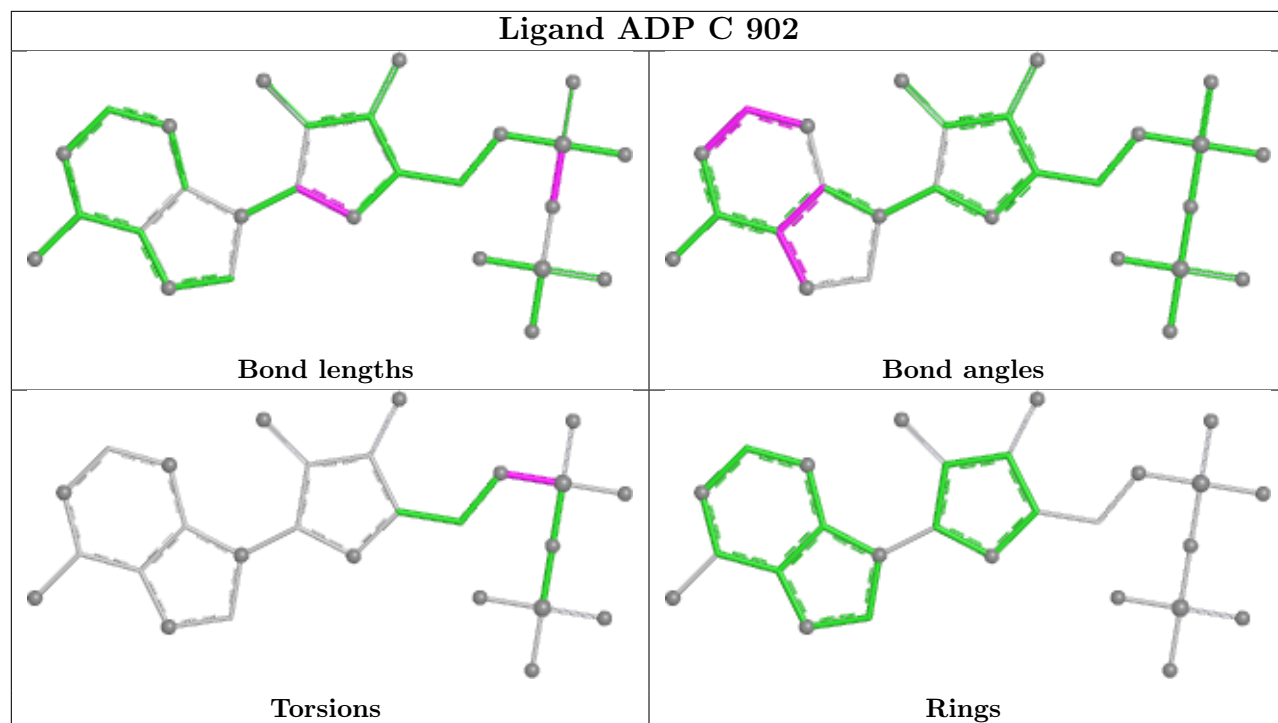
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

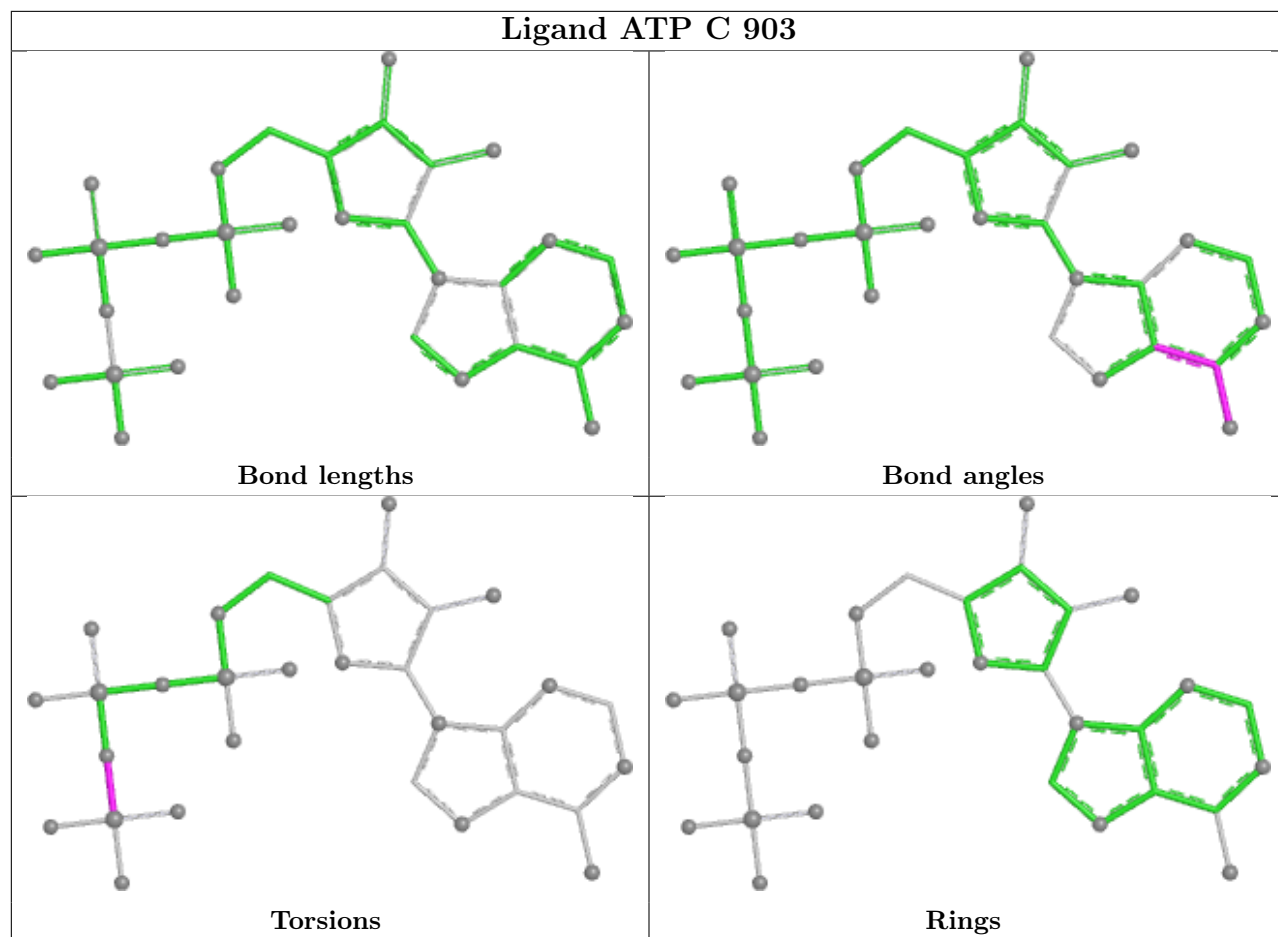
Ligand ATP A 903

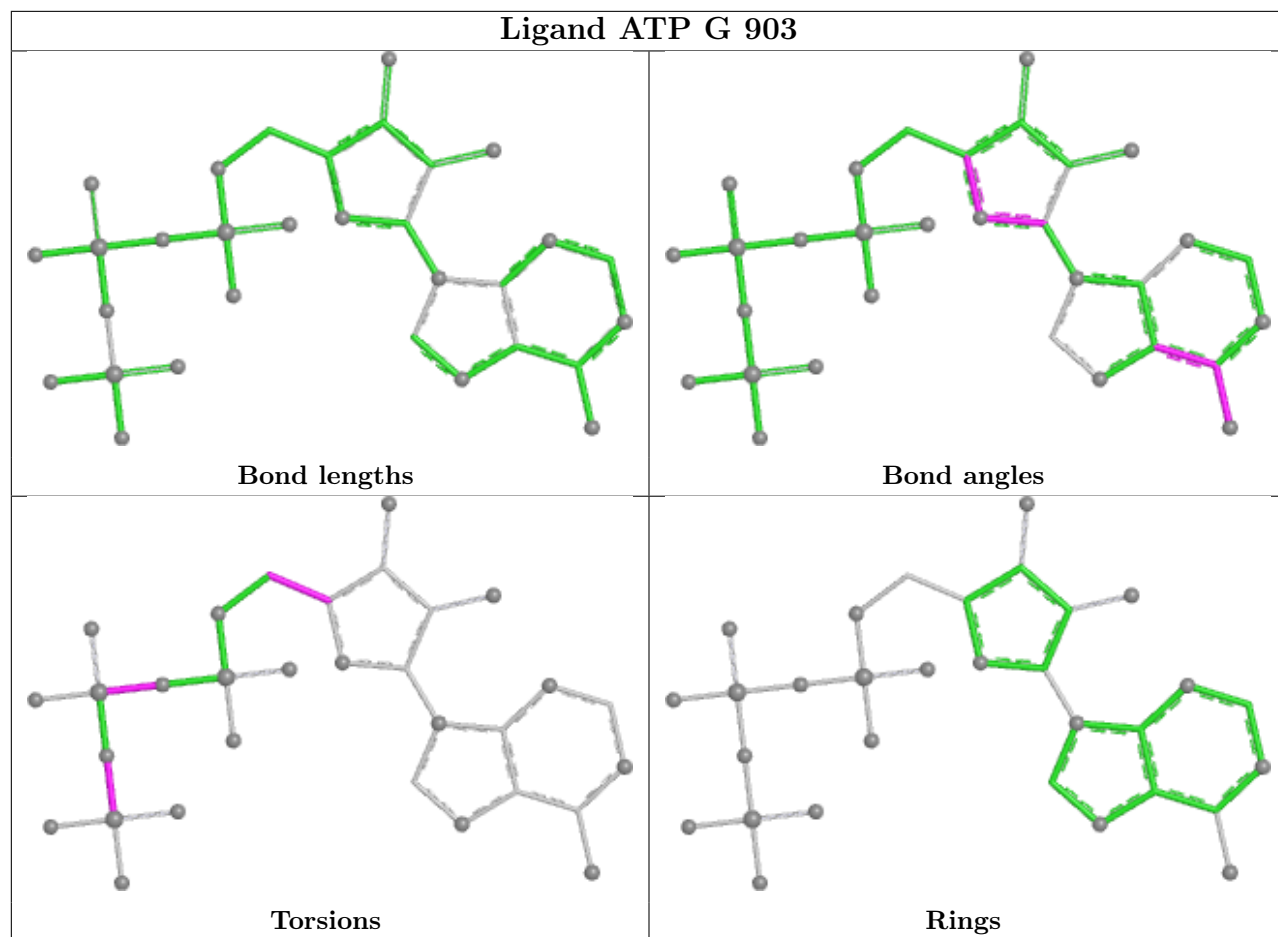


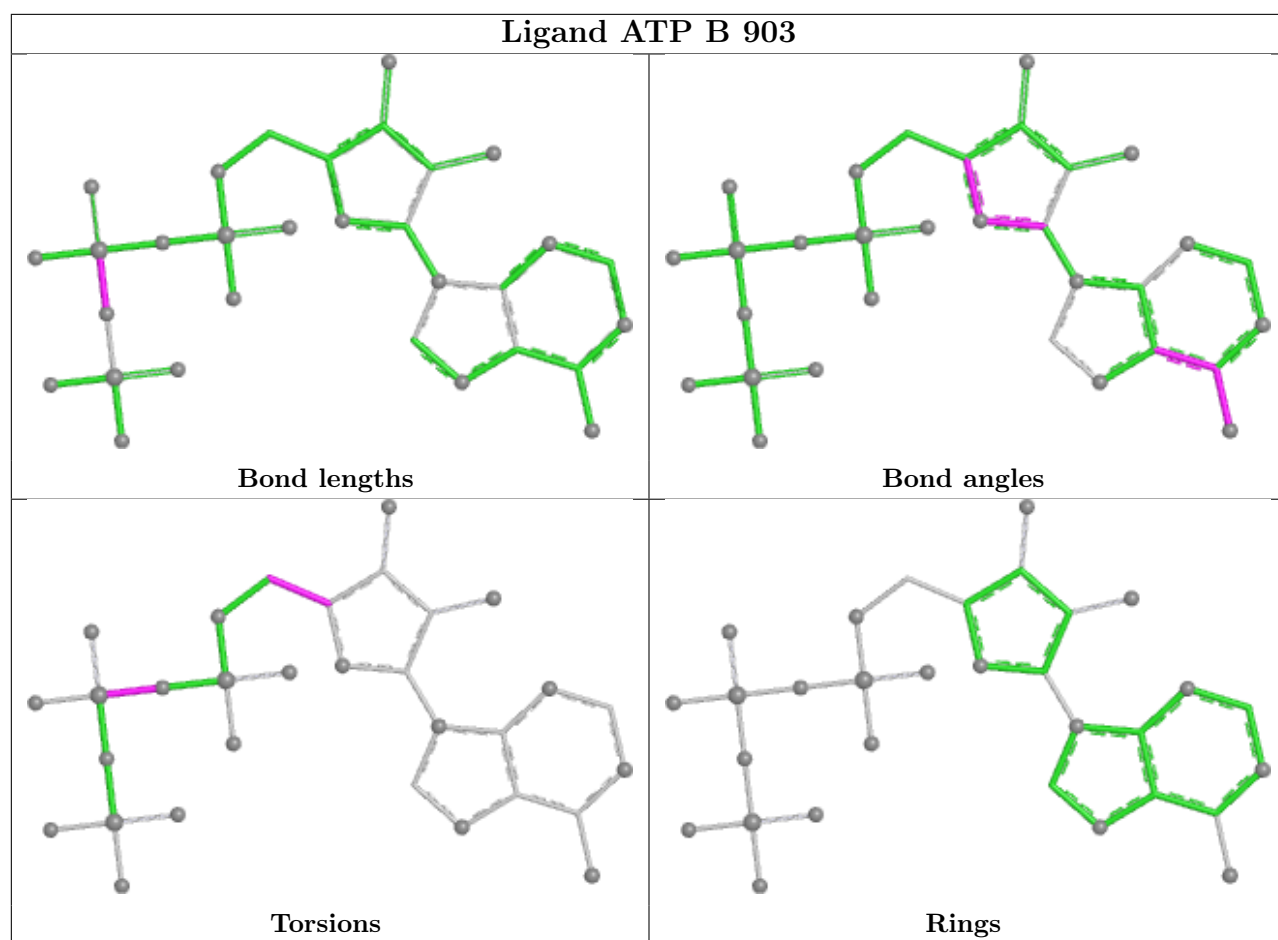
Ligand ADP B 902

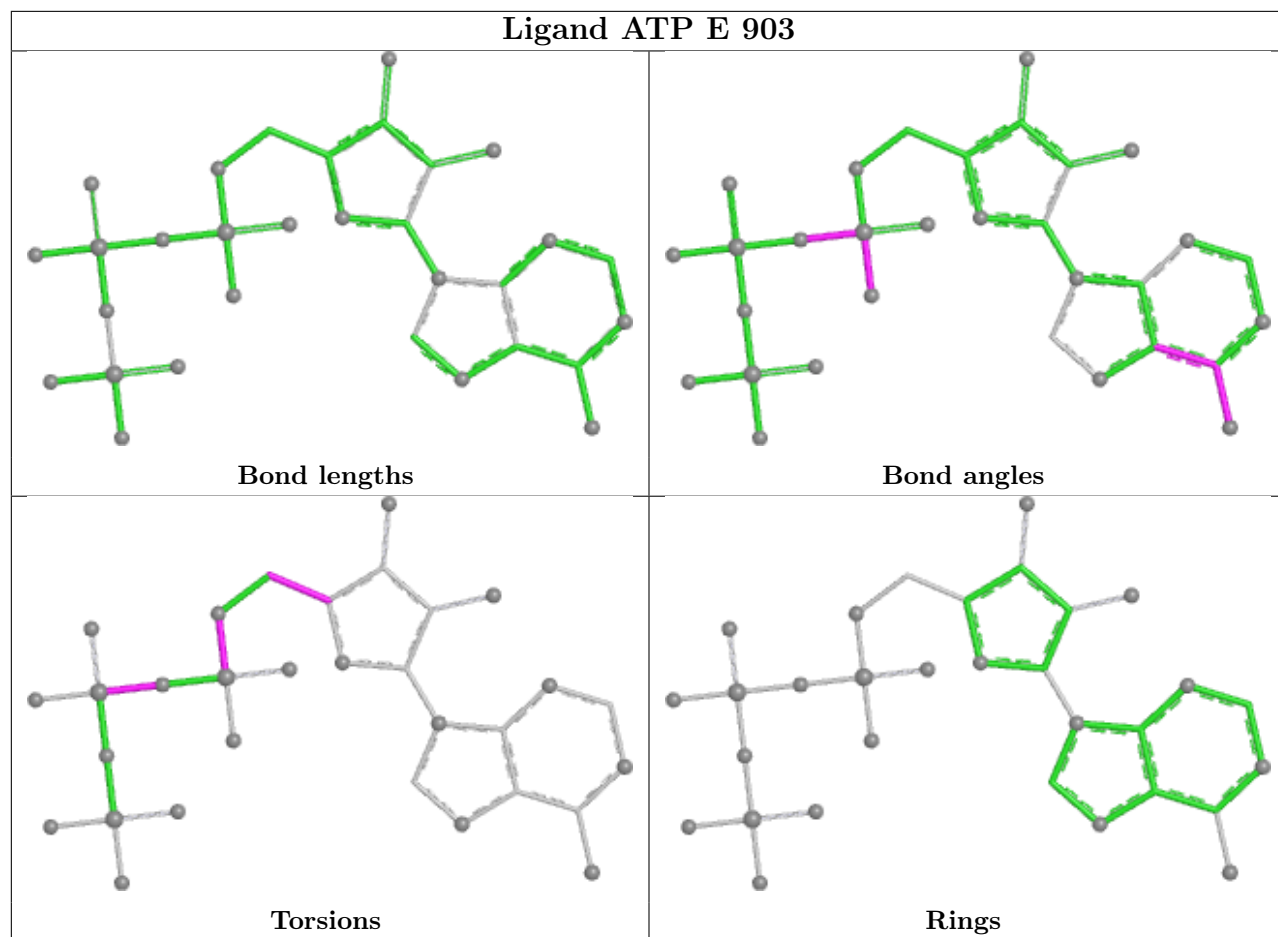




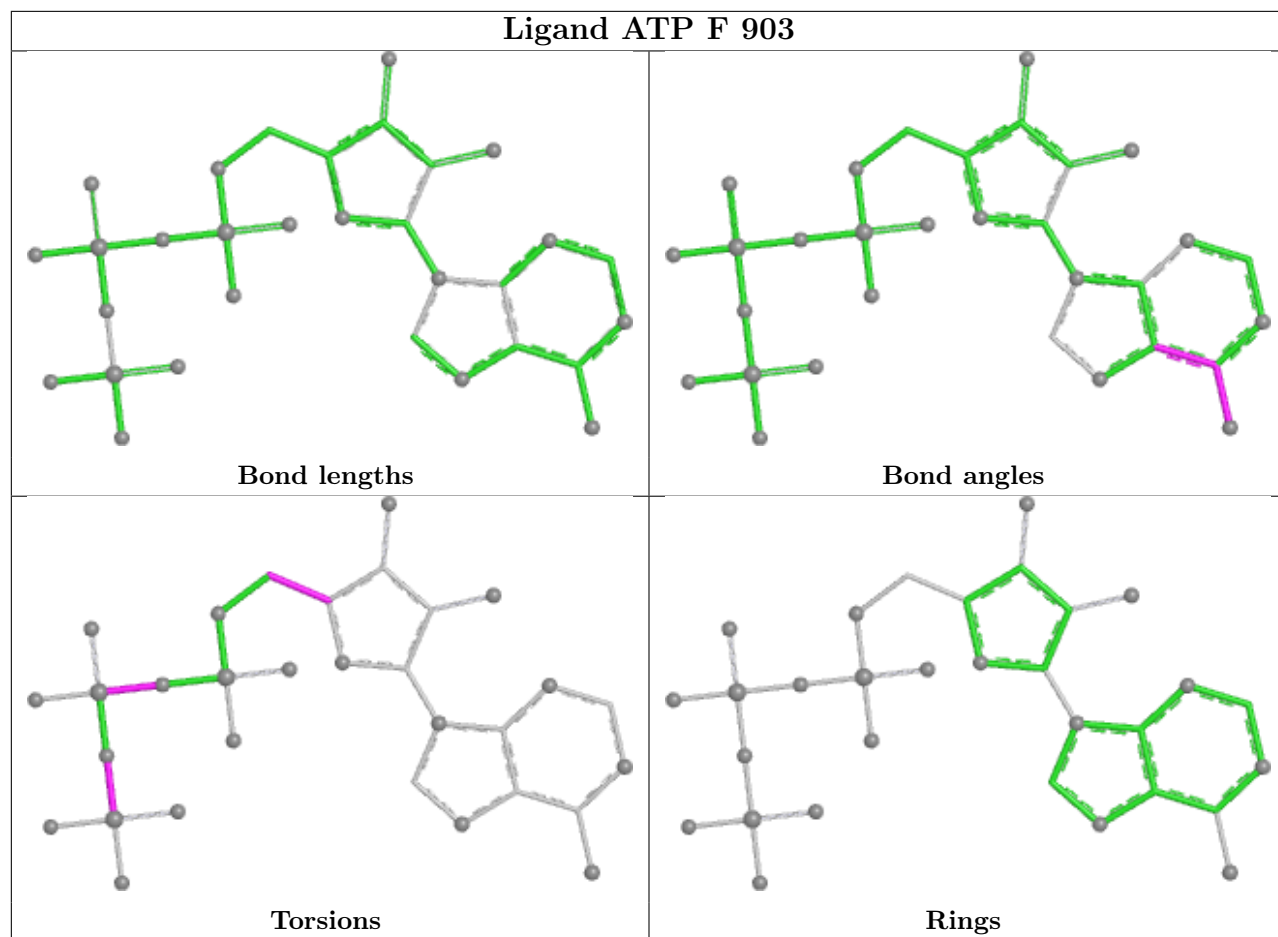




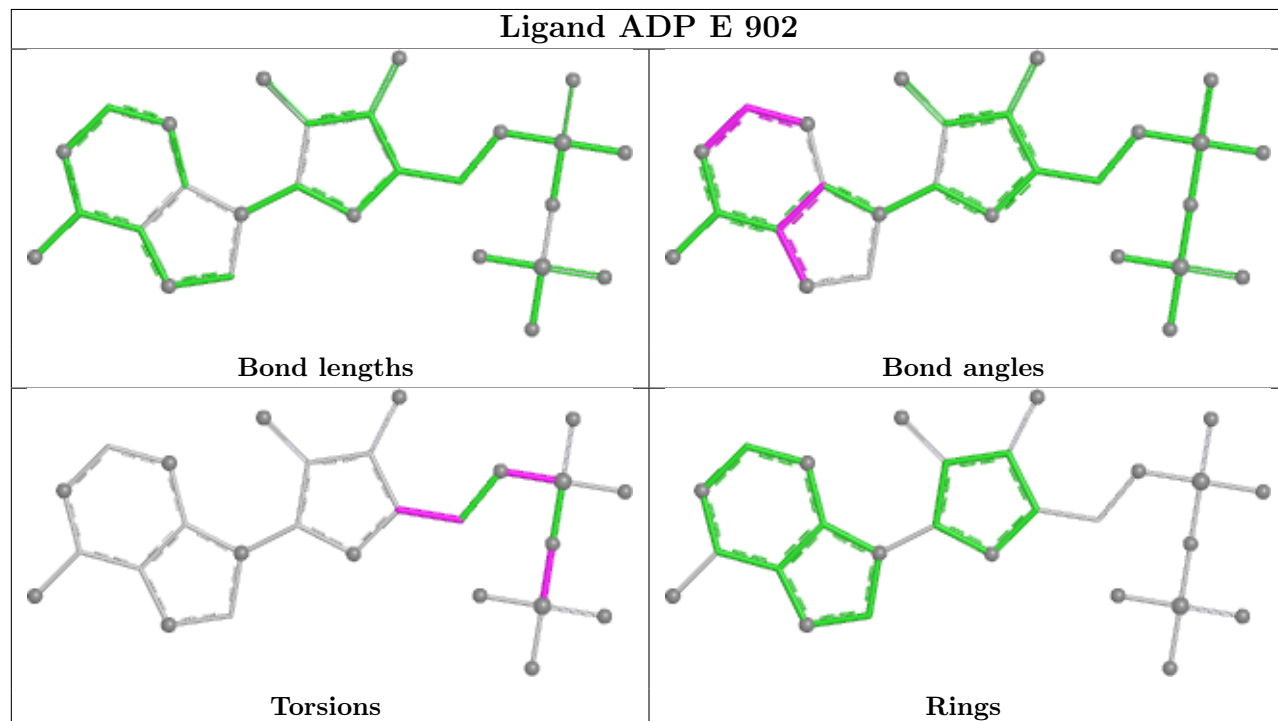


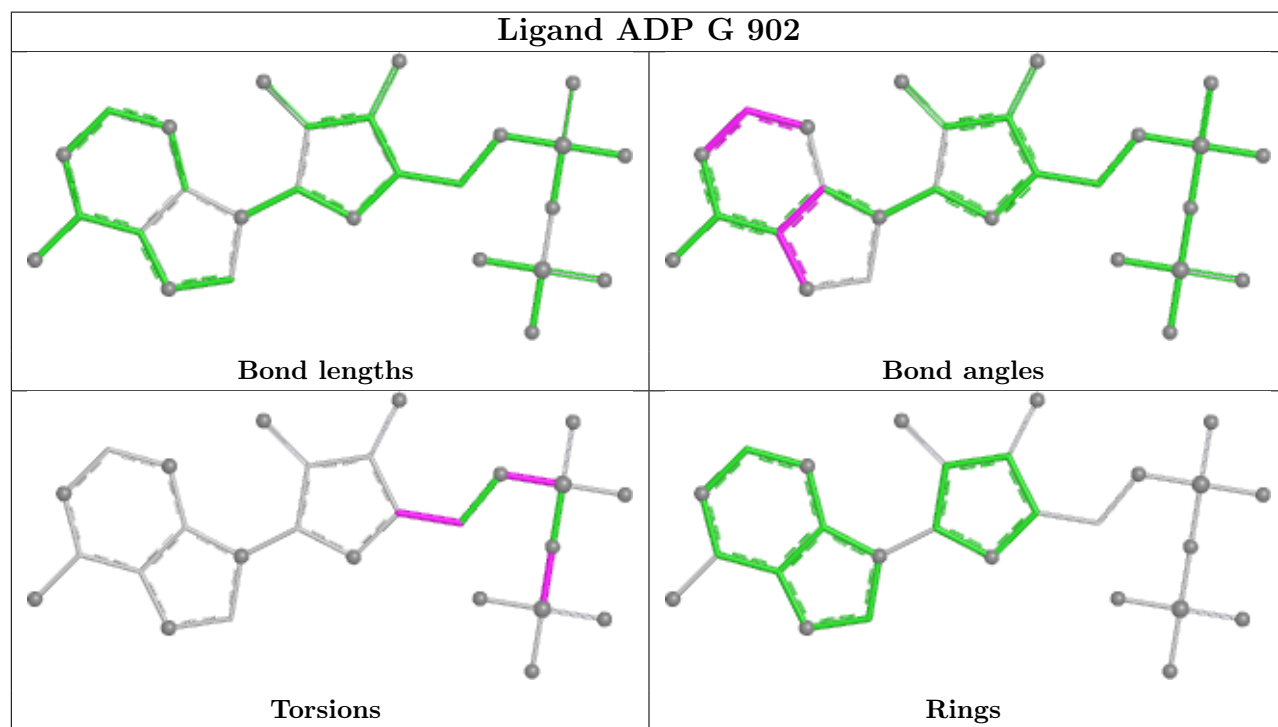
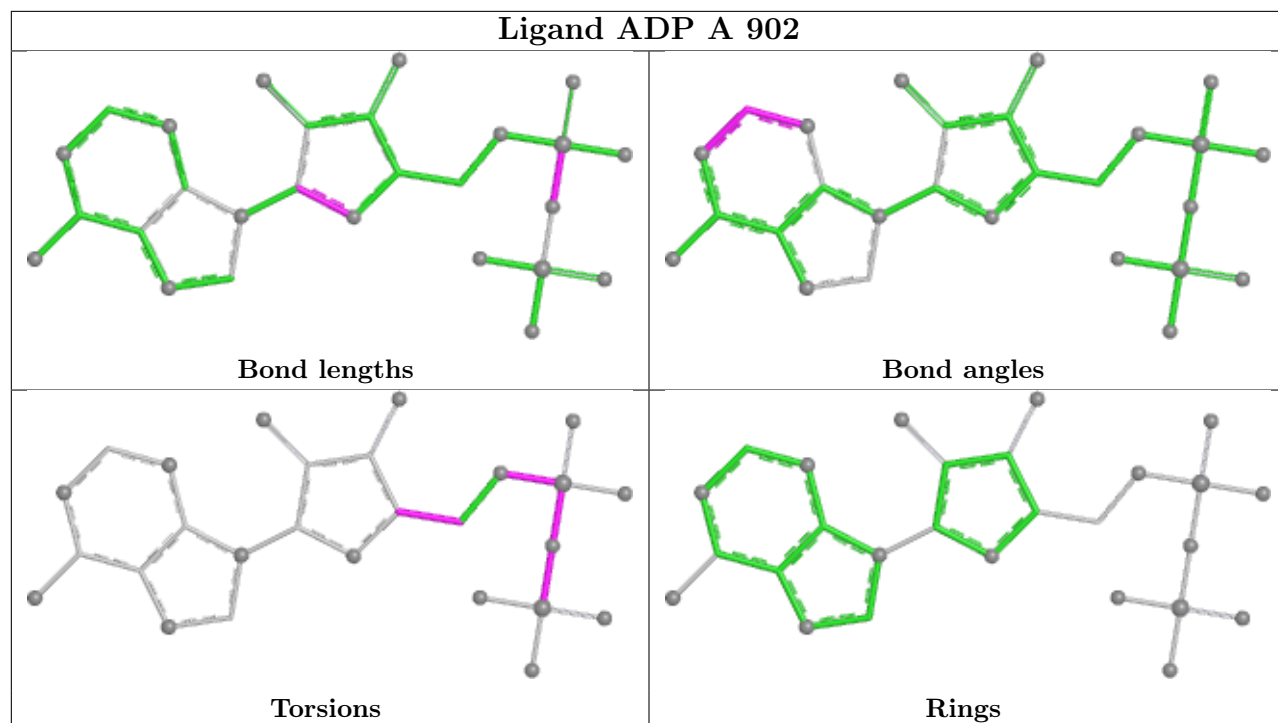


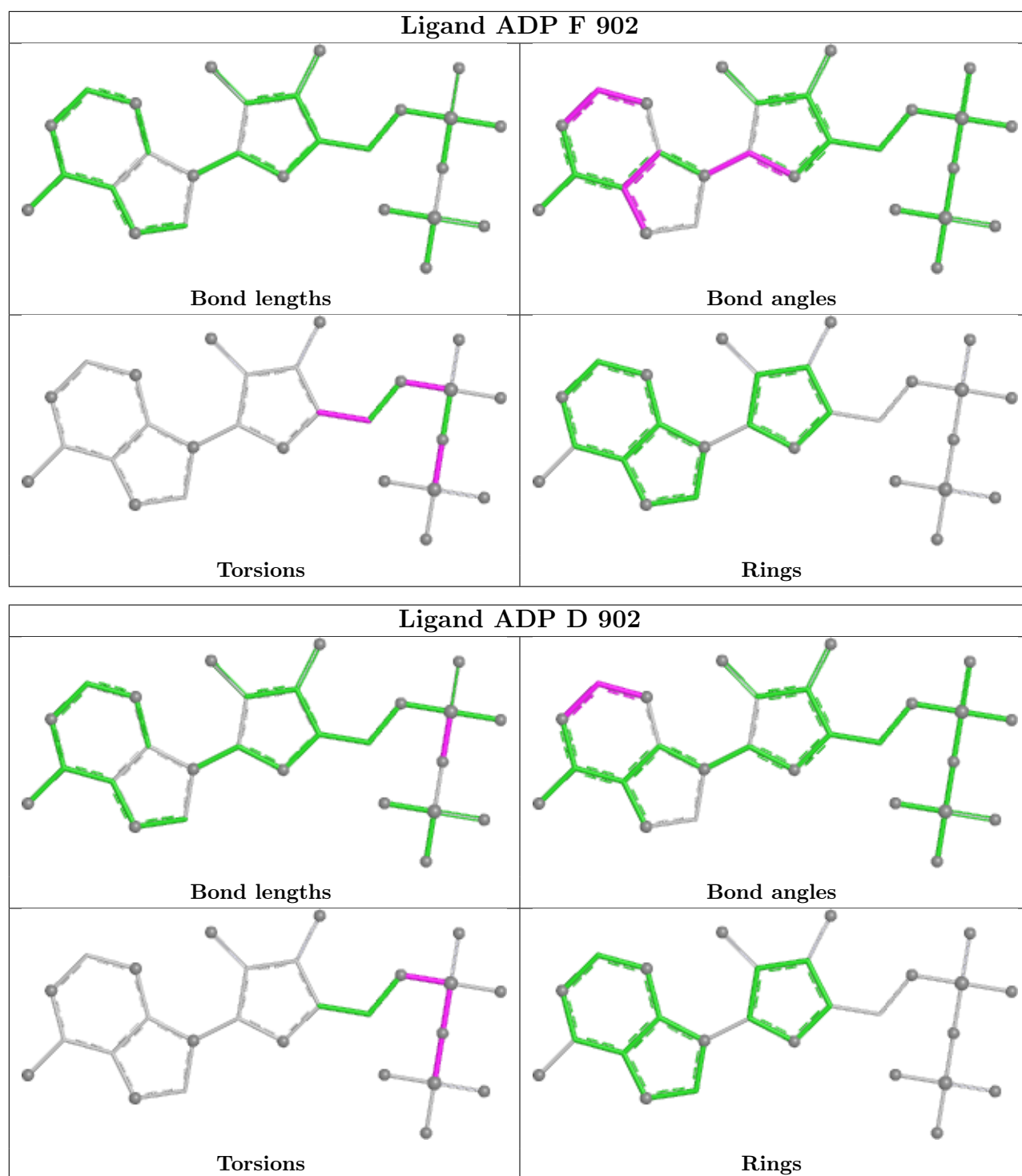
Ligand ATP F 903



Ligand ADP E 902







5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

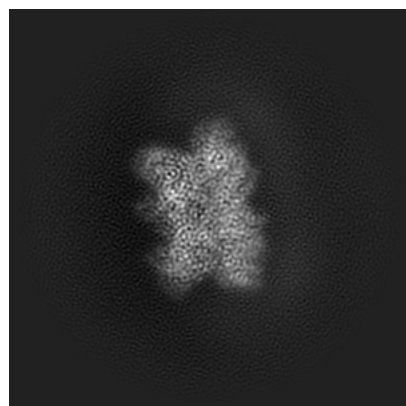
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-49824. These allow visual inspection of the internal detail of the map and identification of artifacts.

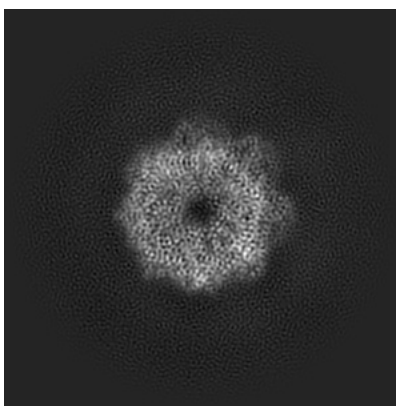
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

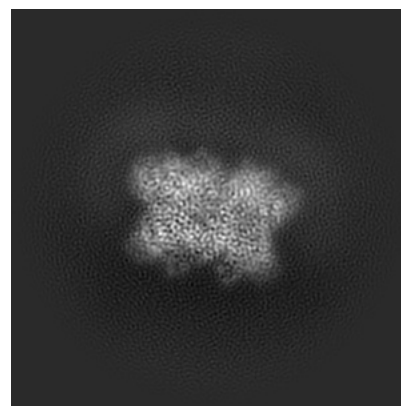
6.1.1 Primary map



X

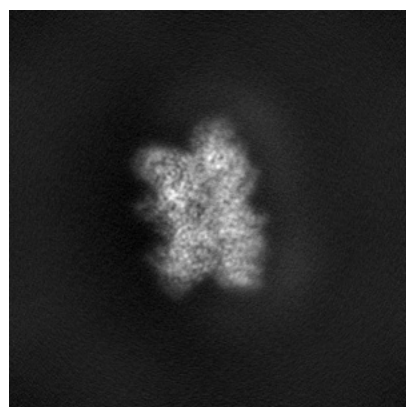


Y

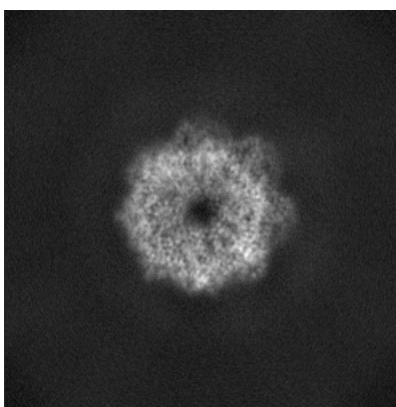


Z

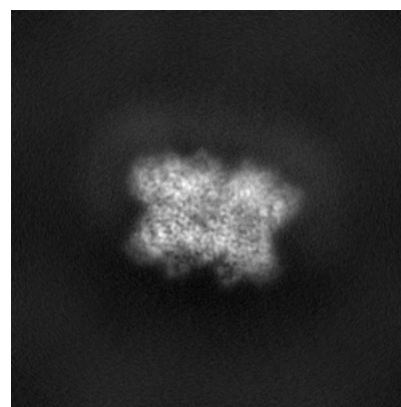
6.1.2 Raw map



X



Y

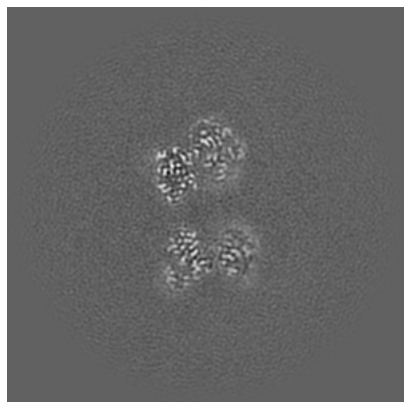


Z

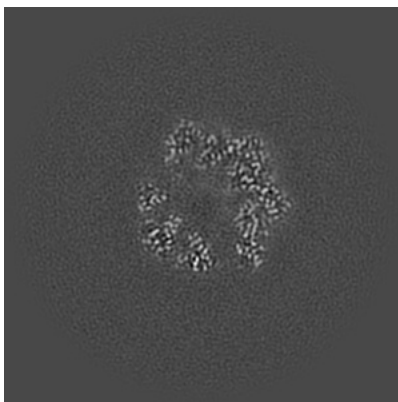
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

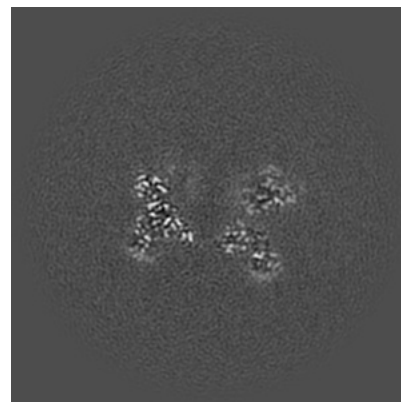
6.2.1 Primary map



X Index: 165

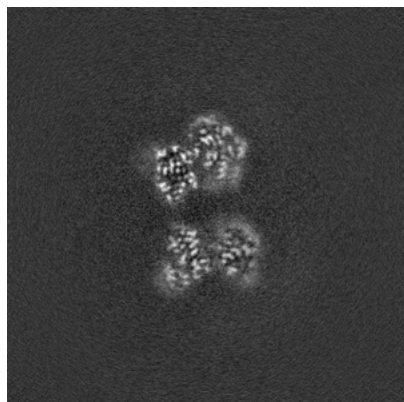


Y Index: 165

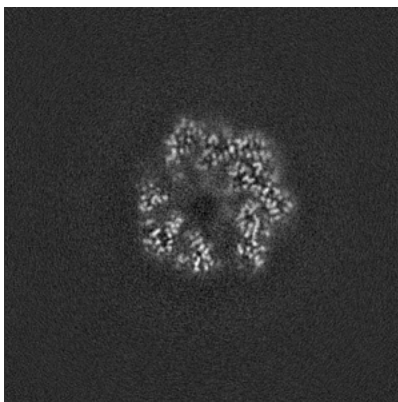


Z Index: 165

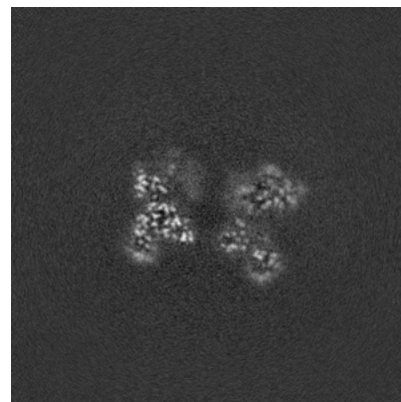
6.2.2 Raw map



X Index: 165



Y Index: 165

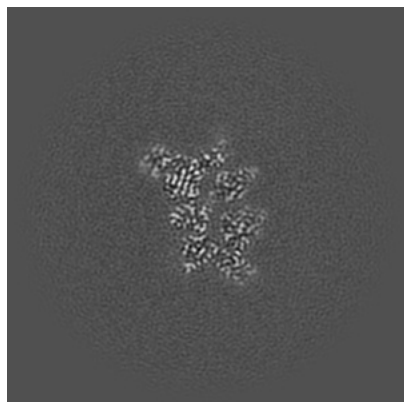


Z Index: 165

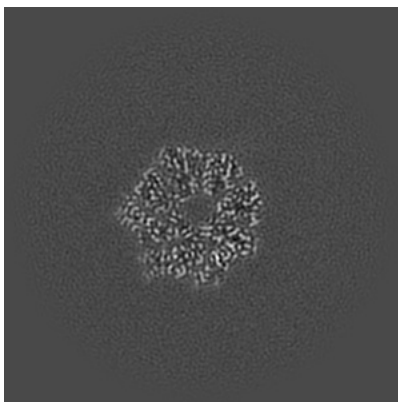
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

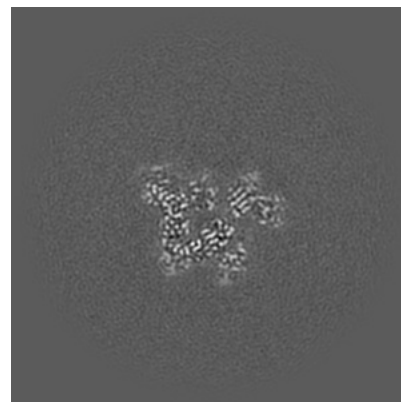
6.3.1 Primary map



X Index: 134

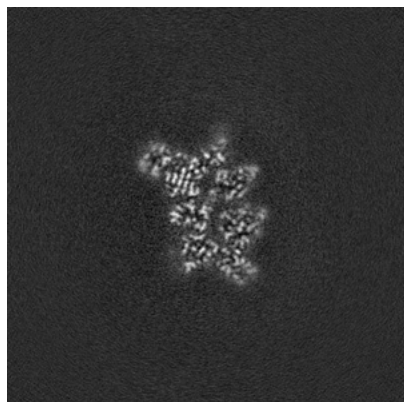


Y Index: 143

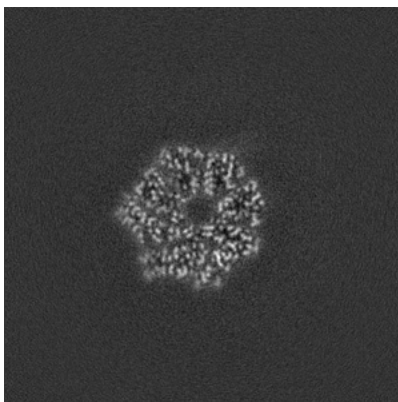


Z Index: 199

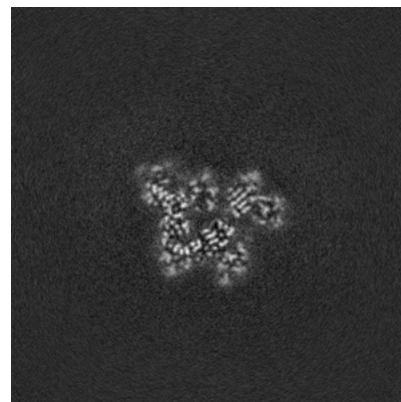
6.3.2 Raw map



X Index: 134



Y Index: 143

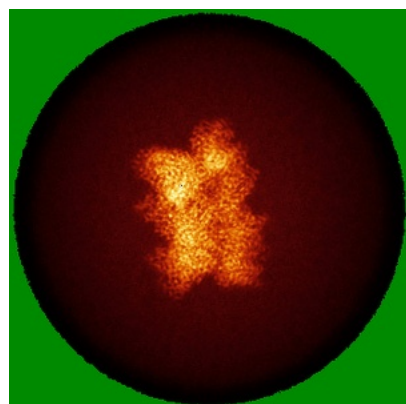


Z Index: 200

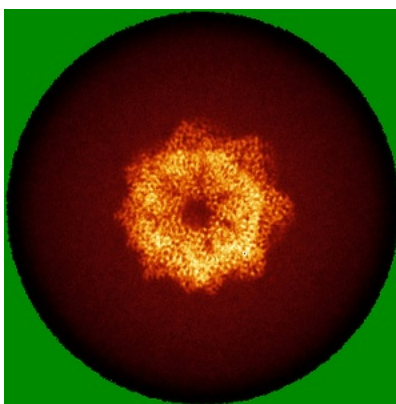
The images above show the largest variance slices of the map in three orthogonal directions.

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

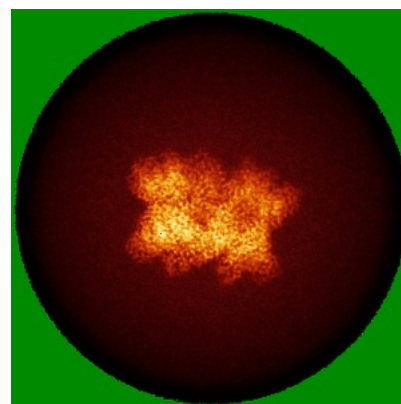
6.4.1 Primary map



X

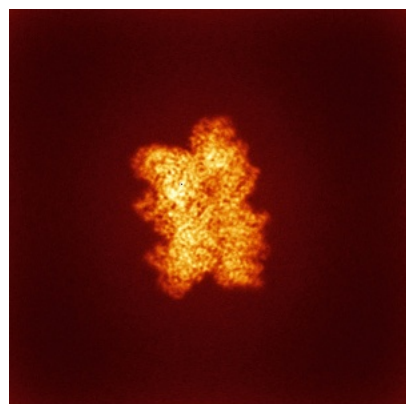


Y

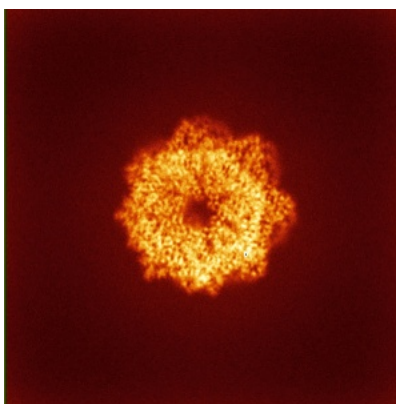


Z

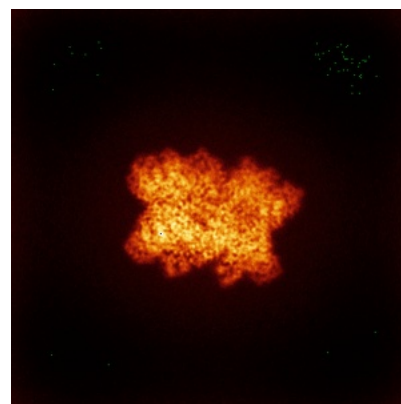
6.4.2 Raw map



X



Y



Z

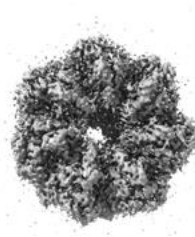
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



X



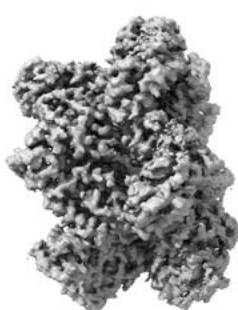
Y



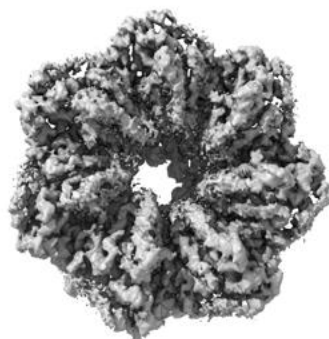
Z

The images above show the 3D surface view of the map at the recommended contour level 0.313. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



X



Y



Z

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

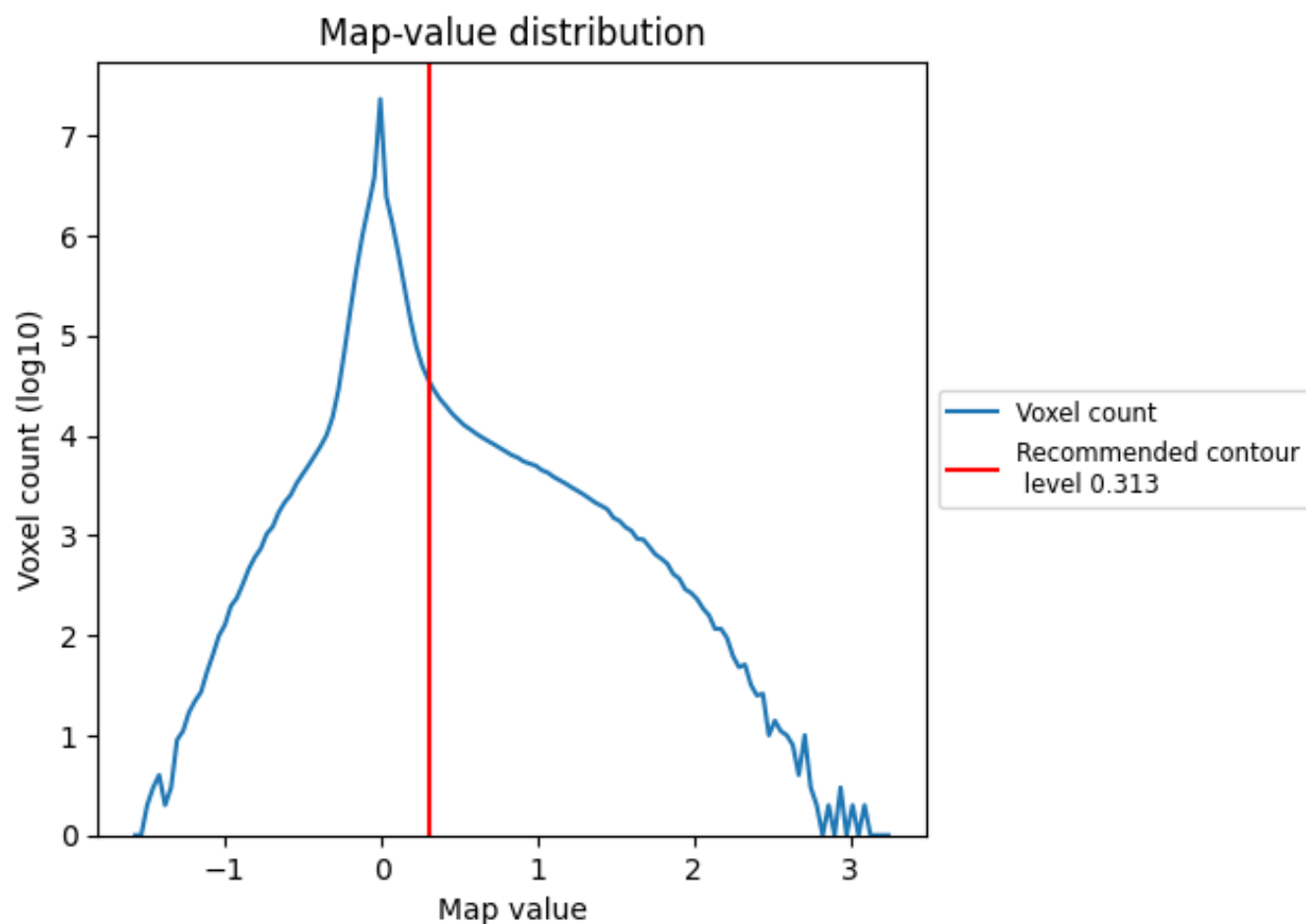
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

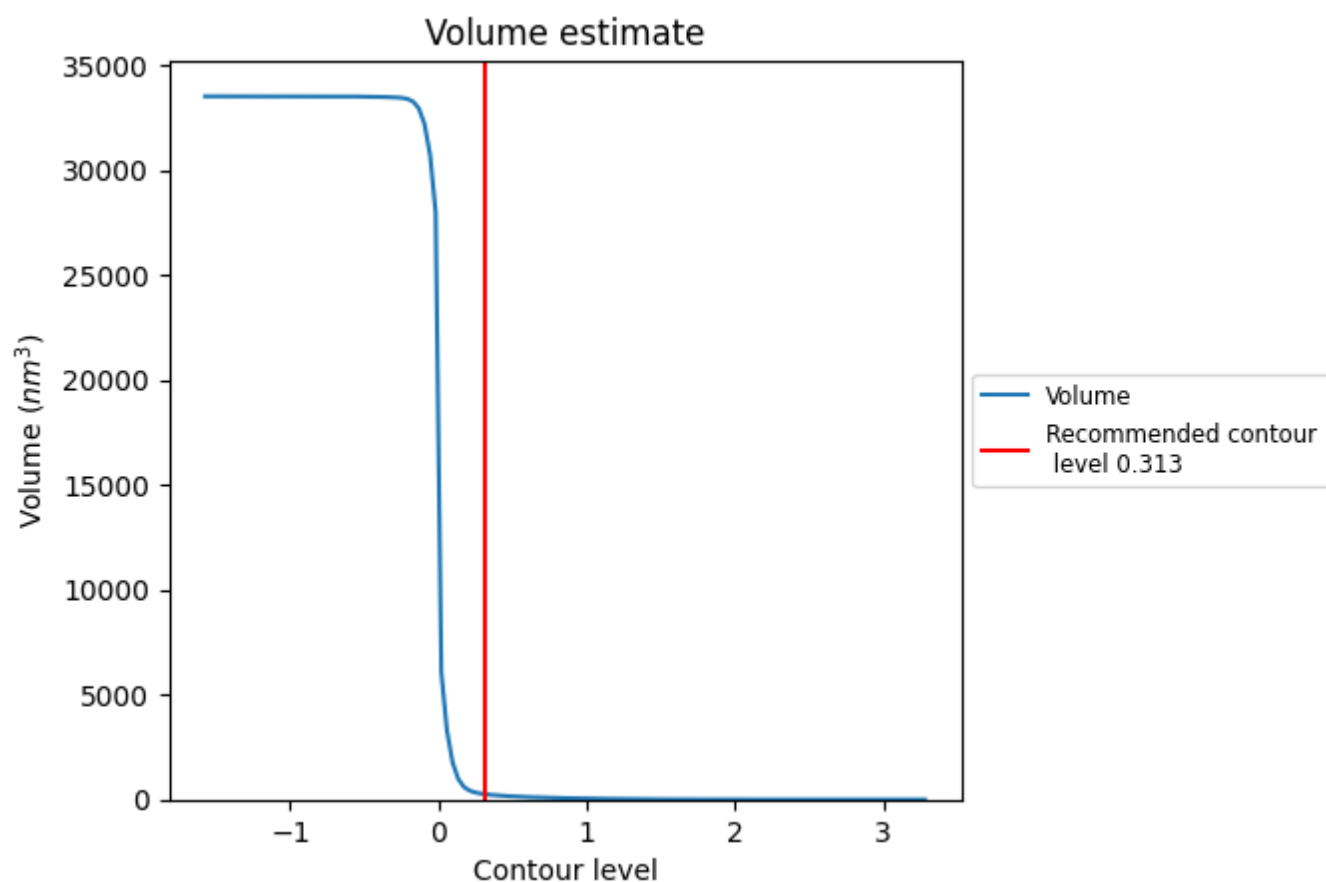
This section contains the results of statistical analysis of the map.

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.

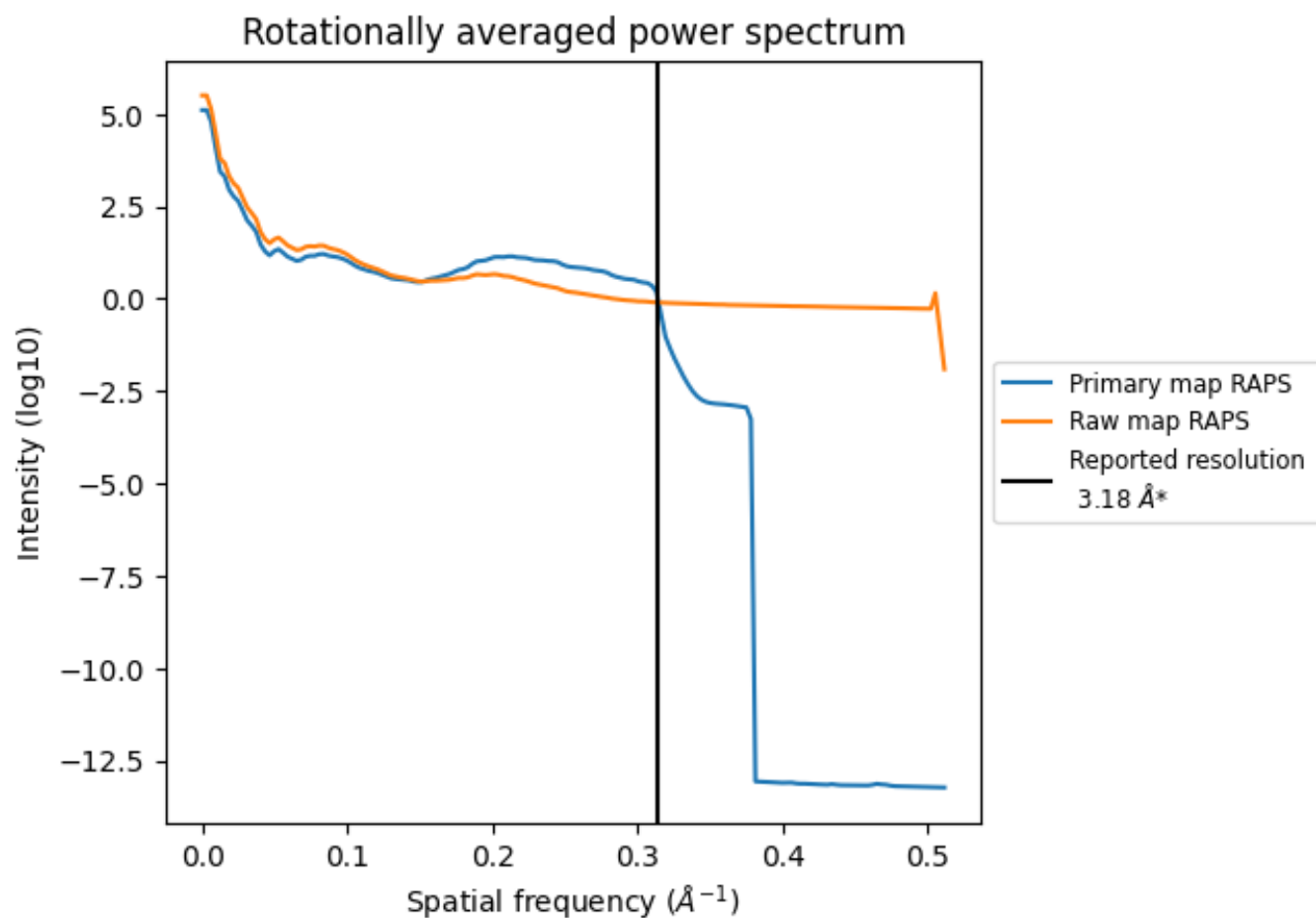
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 258 nm³; this corresponds to an approximate mass of 233 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 ⓘ

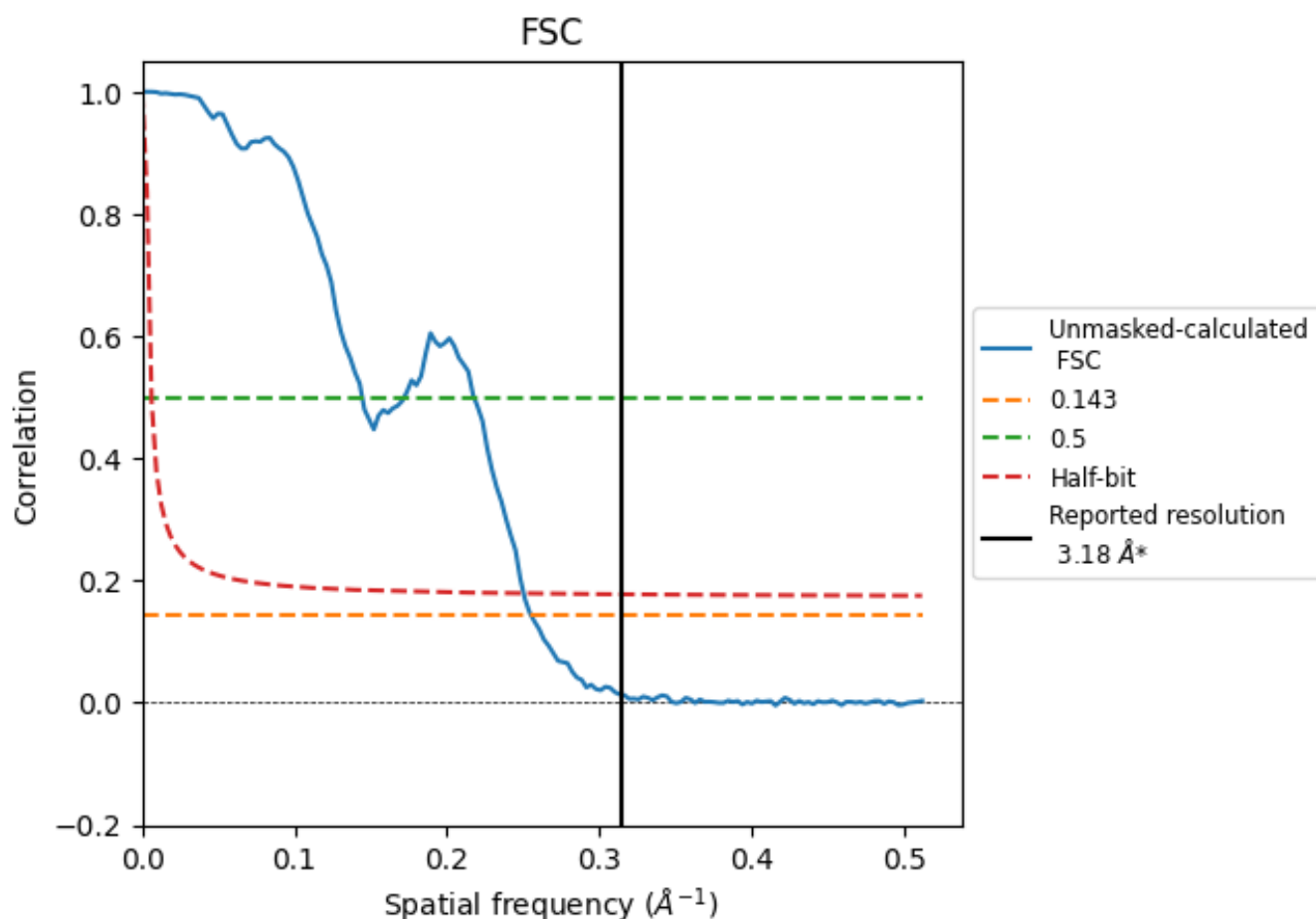


*Reported resolution corresponds to spatial frequency of 0.314 Å⁻¹

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 $0.314 \text{ \AA}^{-1}$

8.2 Resolution estimates [i](#)

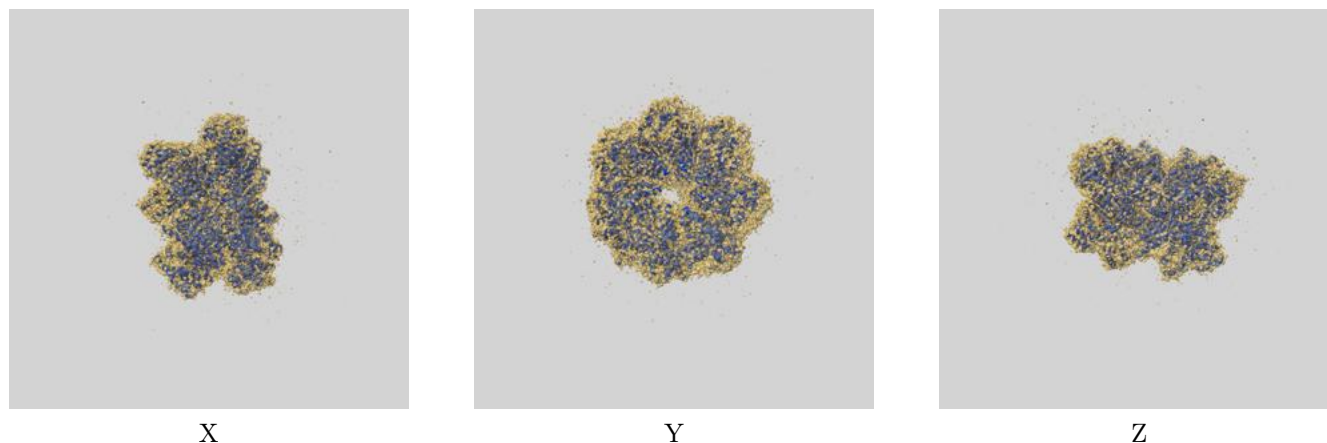
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.18	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	3.92	6.93	4.00

*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 3.92 differs from the reported value 3.18 by more than 10 %

9 Map-model fit [i](#)

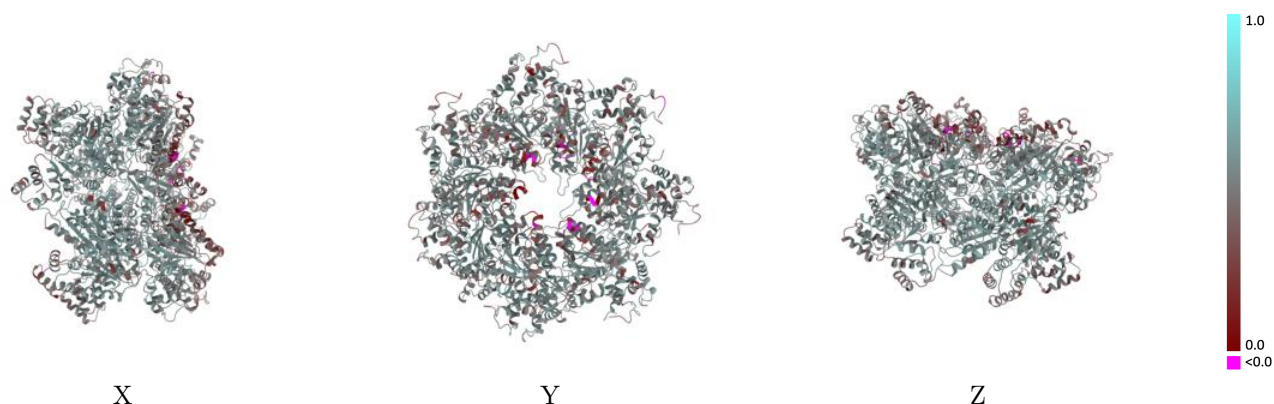
This section contains information regarding the fit between EMDB map EMD-49824 and PDB model 9NUZ. Per-residue inclusion information can be found in section [3](#) on page [8](#).

9.1 Map-model overlay [i](#)



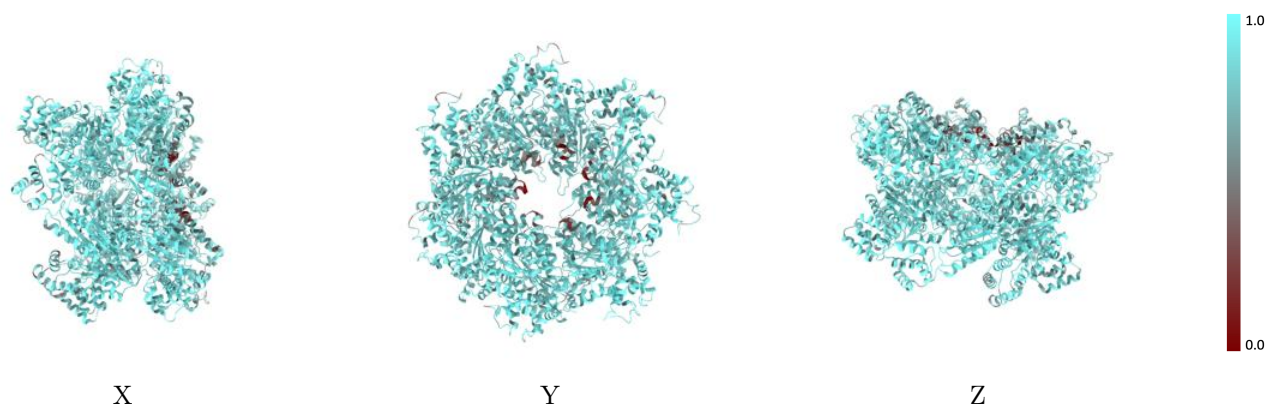
The images above show the 3D surface view of the map at the recommended contour level 0.313 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



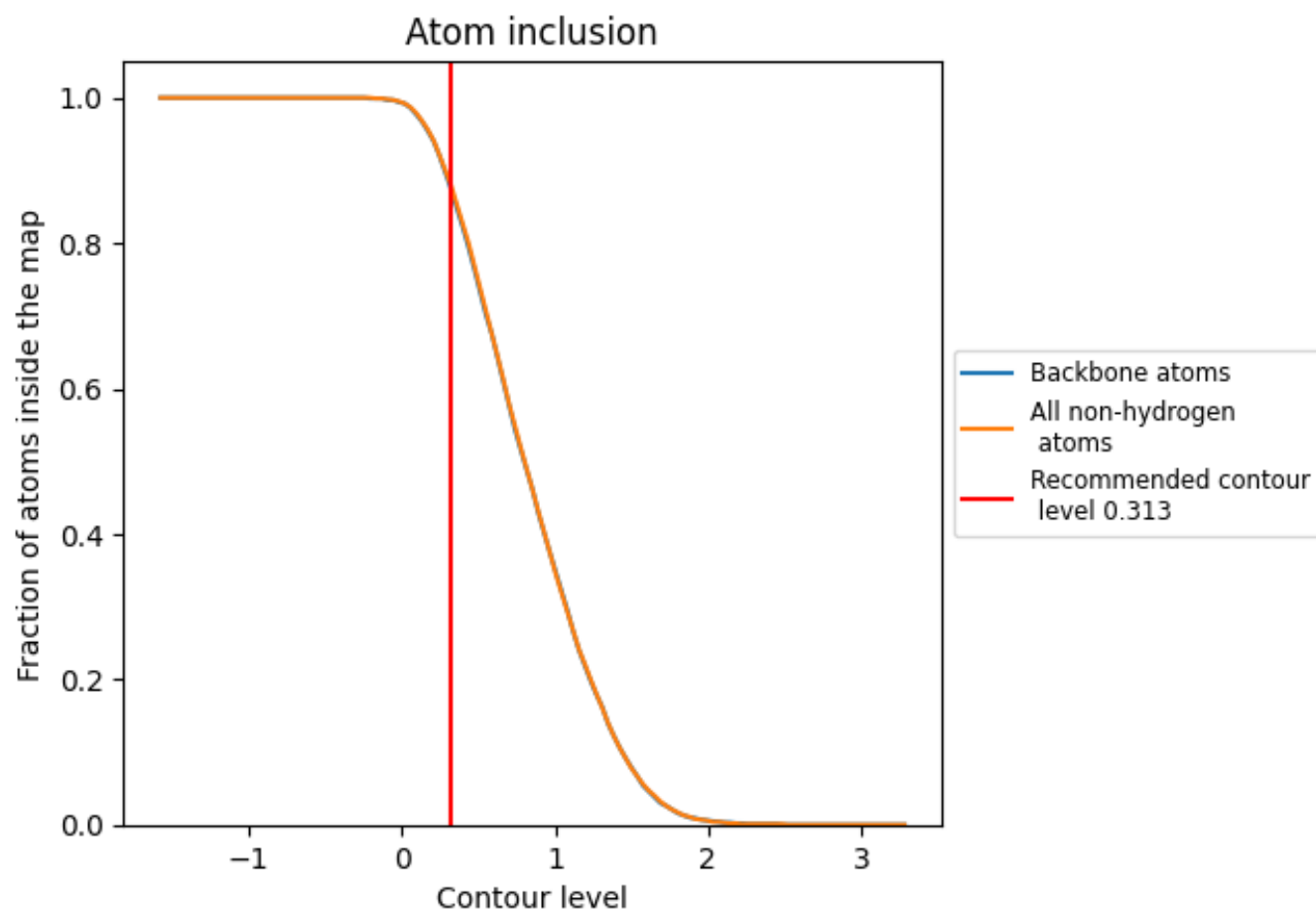
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.313).

9.4 Atom inclusion [i](#)



At the recommended contour level, 88% of all backbone atoms, 88% 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 (0.313) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8850	0.5050
A	0.8980	0.5140
B	0.9030	0.5120
C	0.8950	0.5130
D	0.8710	0.4950
E	0.8750	0.4940
F	0.8590	0.4940
G	0.8910	0.5090

1.0

0.0

<0.0