



wwPDB EM Validation Summary Report ⓘ

Nov 11, 2024 – 09:36 PM JST

PDB ID : 7Y42
EMDB ID : EMD-33600
Title : Cryo-EM structure of the SARS-CoV-2 spike glycoprotein in complex with all-trans retinoic acid
Authors : Xiang, Y.; Wang, L.
Deposited on : 2022-06-13
Resolution : 3.45 Å(reported)

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

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A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

EMDB validation analysis : 0.0.1.dev113
Mogul : 1.8.5 (274361), CSD as541be (2020)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.39

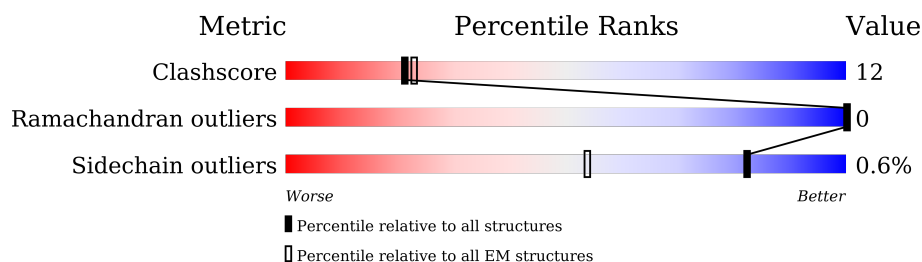
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.45 Å.

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



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

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

Mol	Chain	Length	Quality of chain
1	A	1121	 64% 22% 14%
1	B	1121	 64% 22% 14%
1	D	1121	 64% 22% 14%

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
3	REA	D	1310	-	-	X	-

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 23058 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 Spike glycoprotein.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	968	Total	C	N	O	S	0	0
			7538	4811	1251	1446	30		
1	B	968	Total	C	N	O	S	0	0
			7538	4811	1251	1446	30		
1	D	968	Total	C	N	O	S	0	0
			7538	4811	1251	1446	30		

There are 9 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	166	PHE	CYS	engineered mutation	UNP P0DTC2
A	986	PRO	LYS	engineered mutation	UNP P0DTC2
A	987	PRO	VAL	engineered mutation	UNP P0DTC2
B	166	PHE	CYS	engineered mutation	UNP P0DTC2
B	986	PRO	LYS	engineered mutation	UNP P0DTC2
B	987	PRO	VAL	engineered mutation	UNP P0DTC2
D	166	PHE	CYS	engineered mutation	UNP P0DTC2
D	986	PRO	LYS	engineered mutation	UNP P0DTC2
D	987	PRO	VAL	engineered mutation	UNP P0DTC2

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



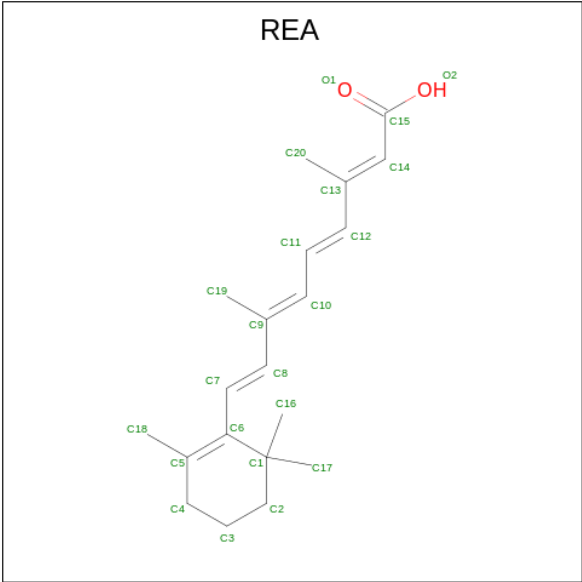
Mol	Chain	Residues	Atoms				AltConf
			Total	C	N	O	
2	A	1	14	8	1	5	0
2	A	1	14	8	1	5	0
2	A	1	14	8	1	5	0
2	A	1	14	8	1	5	0
2	A	1	14	8	1	5	0
2	A	1	14	8	1	5	0
2	A	1	14	8	1	5	0
2	A	1	14	8	1	5	0
2	A	1	14	8	1	5	0
2	B	1	14	8	1	5	0
2	B	1	14	8	1	5	0
2	B	1	14	8	1	5	0
2	B	1	14	8	1	5	0
2	B	1	14	8	1	5	0

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

- Molecule 3 is RETINOIC ACID (three-letter code: REA) (formula: C₂₀H₂₈O₂) (labeled as "Ligand of Interest" by depositor).

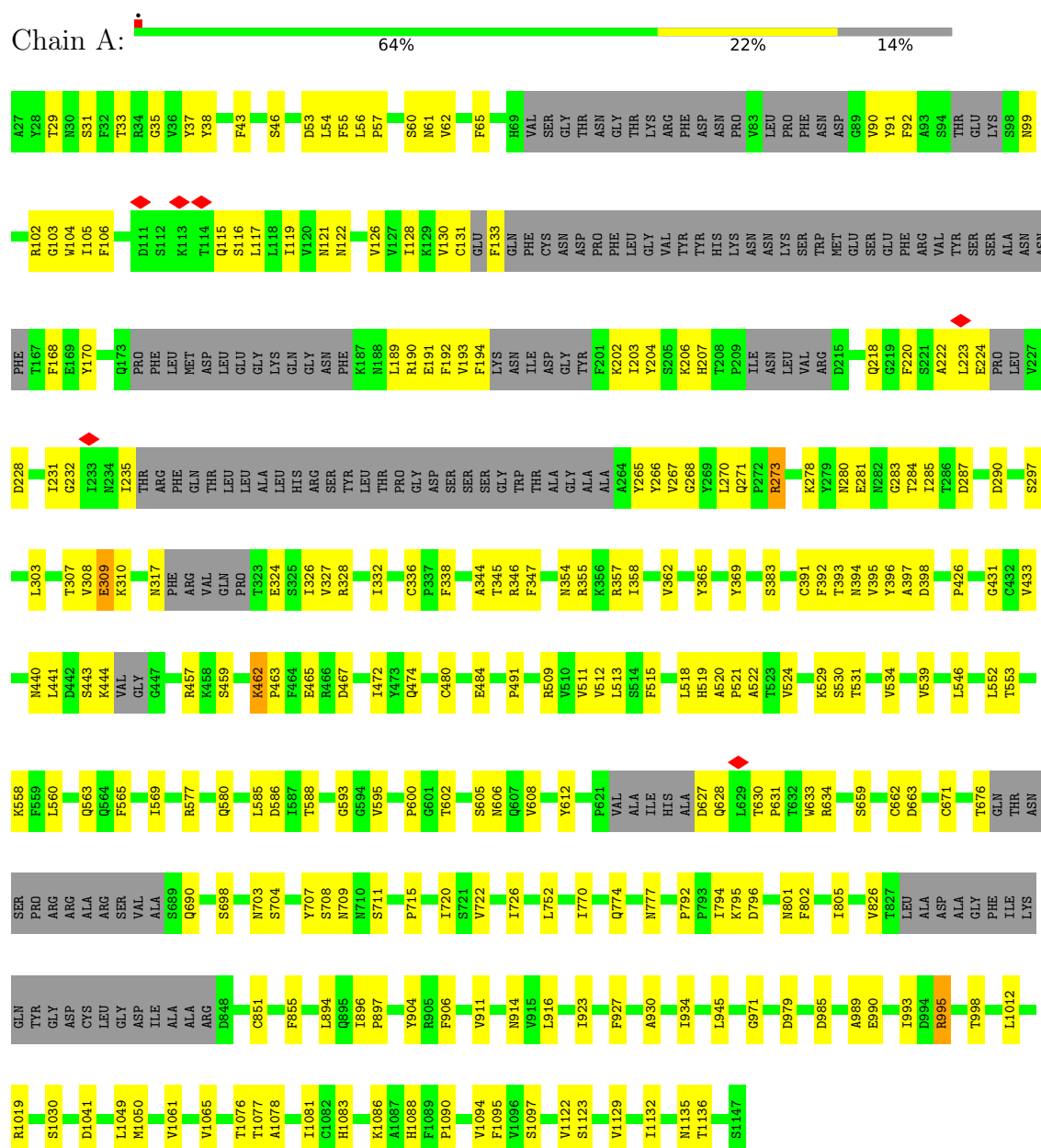


Mol	Chain	Residues	Atoms			AltConf
3	A	1	Total	C	O	0
			22	20	2	
3	B	1	Total	C	O	0
			22	20	2	
3	D	1	Total	C	O	0
			22	20	2	

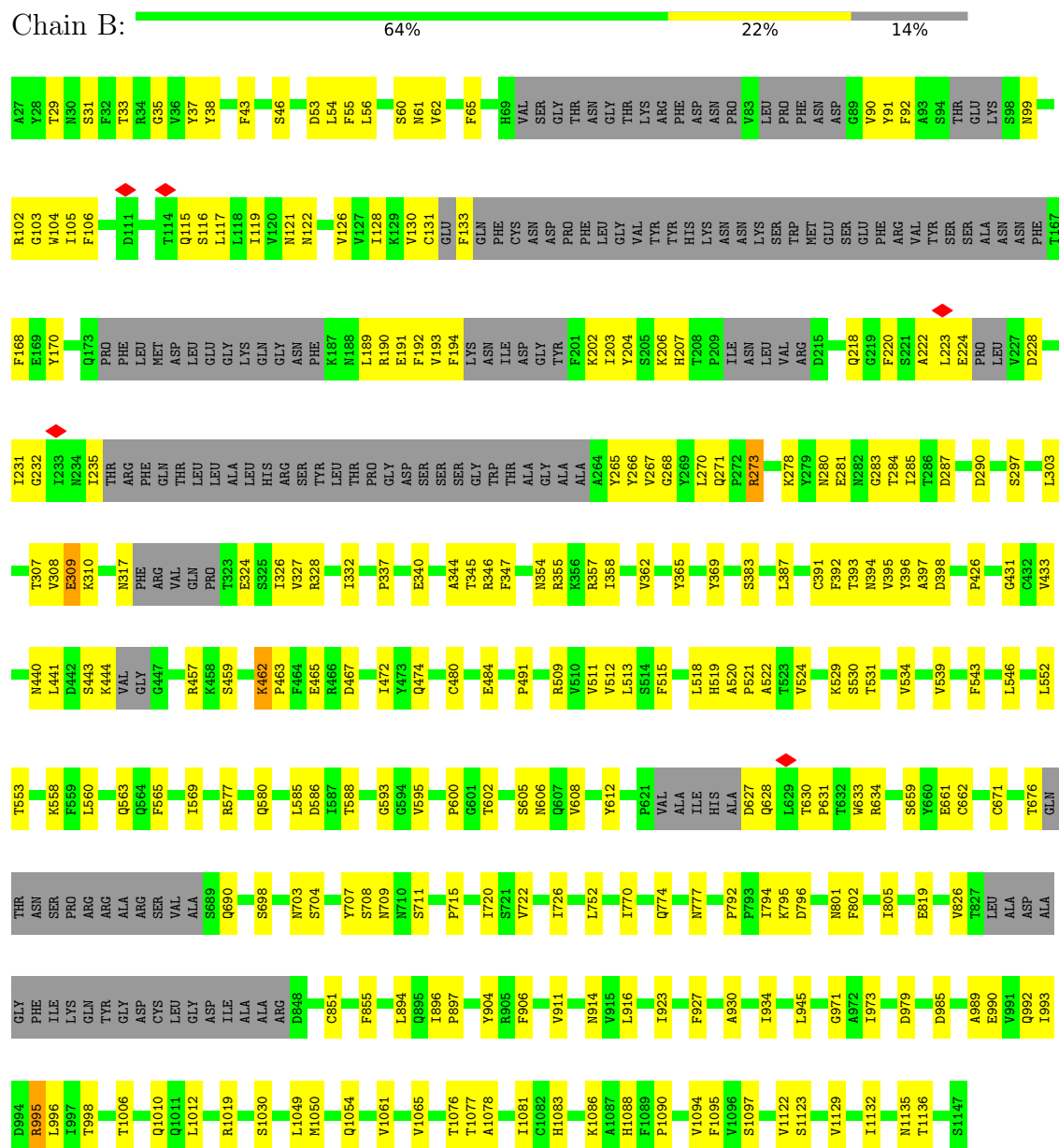
3 Residue-property plots

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.

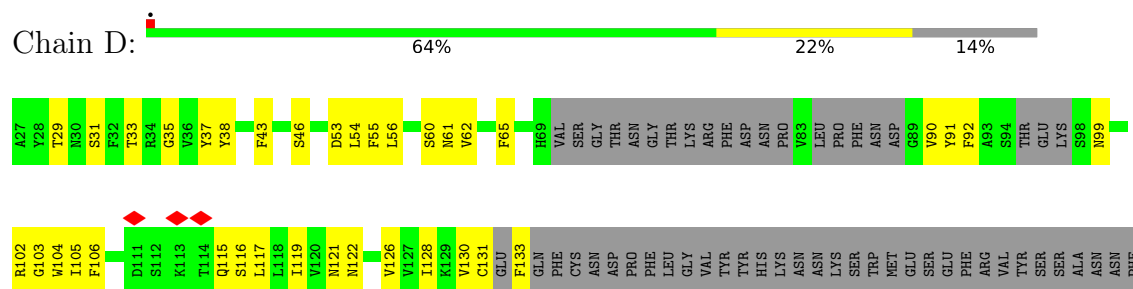
• Molecule 1: Spike glycoprotein



- Molecule 1: Spike glycoprotein



- Molecule 1: Spike glycoprotein



E990	GLY	THR	T553	N440	L303	I231	T167
V991	PHE	ASN	K558	L441	T307	G232	F168
Q992	ILE	SER	F559	S443	V308	I233	E169
I993	LYS	PRO	L560	D442	E309	I234	Y170
D994	GLN	ARG	Q563	K444	K310	I235	Q173
R995	TYR	ARG	Q564	VAL	N317	THR	PRO
T998	GLY	ALA	F565	GLY	PHE	PHE	PHE
L1012	CYS	SER	I569	G447	ARG	GLN	LEU
R1019	GLY	VAL	R577	K458	VAL	THR	MET
D1041	ASP	S689	Q690	S459	GLN	LEU	ASP
L1049	ALA	S698	Q580	K462	PRO	LEU	LEU
M1050	ARG	N703	L585	P463	T323	ALA	LYS
Q1054	D848	S704	D586	F464	E324	HIS	GLN
V1061	C851	Y707	I587	E465	V327	ARG	GLY
V1065	F855	S711	T588	R466	R328	ASN	ASN
T1076		P715	G600	D467	I332	THR	PHE
A1078	L894	I720	T602	C480	THR	THR	K187
I1081	Q895	S721	V608	E484	PRO	PRO	N188
C1082	P897	V722	Y612	Q474	GLY	GLY	L189
H1083	Y904	I726	Y621	I472	ASP	ASP	R190
K1086	R905	L752	P621	Y473	SER	SER	E191
A1087	F906	I770	VAL	G594	SER	SER	F192
F1088	V911		ALA	V595	GLY	GLY	V193
P1090	N914	Q774	ALA	P600	ALA	ALA	F194
V1094	V915	N777	ILE	T602	A264	A264	LYS
F1095	L916	P792	HIS	G601	Y265	Y265	ASN
V1096	I923	P793	ALA	T602	Y266	Y266	LYS
S1097		I794	ALA	G607	V267	V267	ASN
V1122	F927	D796	L629	V608	G268	G268	ILE
S1123	A930		K795	V612	Y269	Y269	ASN
V1129	I934		T630	S514	L270	L270	LEU
I1132	L945	N801	P631	F515	Q271	Q271	VAL
N1135		F802	T632	F515	P272	P272	ARG
T1136	G971	I805	R634	P521	R273	R273	D215
S1147	A972	E819	S659	A520	S383	S383	Q218
	I973	V826	Y660	H519	L368	L368	G219
	D979	T827	C662	A520	F377	F377	F220
	D985	LEU	E661	T523			S921
		ALA	C671	V524			A222
		ASP	T676	V524			L223
				V524			E224
				V524			PRO
				V524			LEU
				V524			V227

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	66436	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	1500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	1.723	Depositor
Minimum map value	-0.954	Depositor
Average map value	0.003	Depositor
Map value standard deviation	0.048	Depositor
Recommended contour level	0.175	Depositor
Map size (Å)	310.40002, 310.40002, 310.40002	wwPDB
Map dimensions	320, 320, 320	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.9700001, 0.9700001, 0.9700001	Depositor

5 Model quality

5.1 Standard geometry

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

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	0.35	0/7698	0.49	0/10466
1	B	0.35	0/7698	0.49	0/10466
1	D	0.35	0/7698	0.49	0/10466
All	All	0.35	0/23094	0.49	0/31398

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	7538	0	7342	185	0
1	B	7538	0	7342	189	0
1	D	7538	0	7342	190	0
2	A	126	0	117	1	0
2	B	126	0	117	1	0
2	D	126	0	117	1	0
3	A	22	0	27	5	0
3	B	22	0	27	7	0
3	D	22	0	27	9	0
All	All	23058	0	22458	530	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 12.

The worst 5 of 530 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:D:368:LEU:HD23	3:D:1310:REA:H12	1.58	0.85
1:B:104:TRP:HE1	1:B:106:PHE:HE1	1.26	0.82
1:A:104:TRP:HE1	1:A:106:PHE:HE1	1.26	0.81
1:D:104:TRP:HE1	1:D:106:PHE:HE1	1.26	0.81
1:D:99:ASN:O	1:D:102:ARG:NH1	2.15	0.80

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	938/1121 (84%)	849 (90%)	89 (10%)	0	100	100
1	B	938/1121 (84%)	849 (90%)	89 (10%)	0	100	100
1	D	938/1121 (84%)	848 (90%)	90 (10%)	0	100	100
All	All	2814/3363 (84%)	2546 (90%)	268 (10%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	841/972 (86%)	836 (99%)	5 (1%)	84	91
1	B	841/972 (86%)	836 (99%)	5 (1%)	84	91
1	D	841/972 (86%)	836 (99%)	5 (1%)	84	91
All	All	2523/2916 (86%)	2508 (99%)	15 (1%)	82	91

5 of 15 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	462	LYS
1	D	995	ARG
1	B	995	ARG
1	D	1050	MET
1	D	309	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	A	474	GLN
1	B	474	GLN
1	D	474	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

30 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	D	1309	1	14,14,15	0.25	0	17,19,21	0.39	0
2	NAG	B	1305	1	14,14,15	0.18	0	17,19,21	0.44	0
3	REA	A	1310	-	22,22,22	2.66	5 (22%)	30,30,30	2.07	11 (36%)
2	NAG	B	1303	1	14,14,15	0.23	0	17,19,21	0.57	0
2	NAG	A	1309	1	14,14,15	0.25	0	17,19,21	0.39	0
2	NAG	B	1304	1	14,14,15	0.16	0	17,19,21	0.45	0
2	NAG	A	1307	1	14,14,15	0.29	0	17,19,21	0.47	0
2	NAG	B	1302	1	14,14,15	0.20	0	17,19,21	0.38	0
2	NAG	A	1305	1	14,14,15	0.18	0	17,19,21	0.45	0
2	NAG	A	1301	1	14,14,15	0.26	0	17,19,21	0.56	0
2	NAG	D	1303	1	14,14,15	0.23	0	17,19,21	0.56	0
2	NAG	D	1301	1	14,14,15	0.26	0	17,19,21	0.56	0
2	NAG	D	1306	1	14,14,15	0.20	0	17,19,21	0.47	0
2	NAG	A	1303	1	14,14,15	0.24	0	17,19,21	0.56	0
3	REA	D	1310	-	22,22,22	2.66	5 (22%)	30,30,30	2.07	11 (36%)
2	NAG	B	1306	1	14,14,15	0.21	0	17,19,21	0.46	0
2	NAG	A	1306	1	14,14,15	0.21	0	17,19,21	0.47	0
2	NAG	D	1308	1	14,14,15	0.24	0	17,19,21	0.44	0
3	REA	B	1310	-	22,22,22	2.67	5 (22%)	30,30,30	2.07	11 (36%)
2	NAG	B	1308	1	14,14,15	0.22	0	17,19,21	0.44	0
2	NAG	B	1309	1	14,14,15	0.25	0	17,19,21	0.39	0
2	NAG	B	1301	1	14,14,15	0.27	0	17,19,21	0.56	0
2	NAG	D	1302	1	14,14,15	0.19	0	17,19,21	0.37	0
2	NAG	D	1307	1	14,14,15	0.28	0	17,19,21	0.48	0
2	NAG	A	1302	1	14,14,15	0.20	0	17,19,21	0.38	0
2	NAG	B	1307	1	14,14,15	0.28	0	17,19,21	0.48	0
2	NAG	A	1304	1	14,14,15	0.16	0	17,19,21	0.45	0
2	NAG	D	1304	1	14,14,15	0.15	0	17,19,21	0.44	0
2	NAG	D	1305	1	14,14,15	0.17	0	17,19,21	0.45	0
2	NAG	A	1308	1	14,14,15	0.22	0	17,19,21	0.44	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	NAG	D	1309	1	-	1/6/23/26	0/1/1/1
2	NAG	B	1305	1	-	0/6/23/26	0/1/1/1
3	REA	A	1310	-	-	11/15/32/32	0/1/1/1
2	NAG	B	1303	1	-	0/6/23/26	0/1/1/1
2	NAG	A	1309	1	-	1/6/23/26	0/1/1/1
2	NAG	B	1304	1	-	2/6/23/26	0/1/1/1
2	NAG	A	1307	1	-	0/6/23/26	0/1/1/1
2	NAG	B	1302	1	-	4/6/23/26	0/1/1/1
2	NAG	A	1305	1	-	0/6/23/26	0/1/1/1
2	NAG	A	1301	1	-	1/6/23/26	0/1/1/1
2	NAG	D	1303	1	-	0/6/23/26	0/1/1/1
2	NAG	D	1301	1	-	1/6/23/26	0/1/1/1
2	NAG	D	1306	1	-	2/6/23/26	0/1/1/1
2	NAG	A	1303	1	-	0/6/23/26	0/1/1/1
3	REA	D	1310	-	-	11/15/32/32	0/1/1/1
2	NAG	B	1306	1	-	2/6/23/26	0/1/1/1
2	NAG	A	1306	1	-	2/6/23/26	0/1/1/1
2	NAG	D	1308	1	-	2/6/23/26	0/1/1/1
3	REA	B	1310	-	-	11/15/32/32	0/1/1/1
2	NAG	B	1308	1	-	2/6/23/26	0/1/1/1
2	NAG	B	1309	1	-	1/6/23/26	0/1/1/1
2	NAG	B	1301	1	-	1/6/23/26	0/1/1/1
2	NAG	D	1302	1	-	4/6/23/26	0/1/1/1
2	NAG	D	1307	1	-	0/6/23/26	0/1/1/1
2	NAG	A	1302	1	-	4/6/23/26	0/1/1/1
2	NAG	B	1307	1	-	0/6/23/26	0/1/1/1
2	NAG	A	1304	1	-	2/6/23/26	0/1/1/1
2	NAG	D	1304	1	-	2/6/23/26	0/1/1/1
2	NAG	D	1305	1	-	0/6/23/26	0/1/1/1
2	NAG	A	1308	1	-	2/6/23/26	0/1/1/1

The worst 5 of 15 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	1310	REA	C10-C9	8.37	1.46	1.35
3	A	1310	REA	C10-C9	8.35	1.46	1.35
3	D	1310	REA	C10-C9	8.35	1.46	1.35
3	D	1310	REA	C11-C12	5.08	1.47	1.34
3	A	1310	REA	C11-C12	5.08	1.47	1.34

The worst 5 of 33 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	1310	REA	C7-C8-C9	-4.06	120.11	126.23
3	A	1310	REA	C7-C8-C9	-4.03	120.14	126.23
3	D	1310	REA	C7-C8-C9	-4.02	120.16	126.23
3	D	1310	REA	C1-C6-C5	-3.92	117.10	122.61
3	B	1310	REA	C1-C6-C5	-3.91	117.10	122.61

There are no chirality outliers.

5 of 69 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	1310	REA	C6-C7-C8-C9
3	A	1310	REA	C11-C10-C9-C8
3	A	1310	REA	C11-C10-C9-C19
3	A	1310	REA	C12-C13-C14-C15
3	A	1310	REA	C20-C13-C14-C15

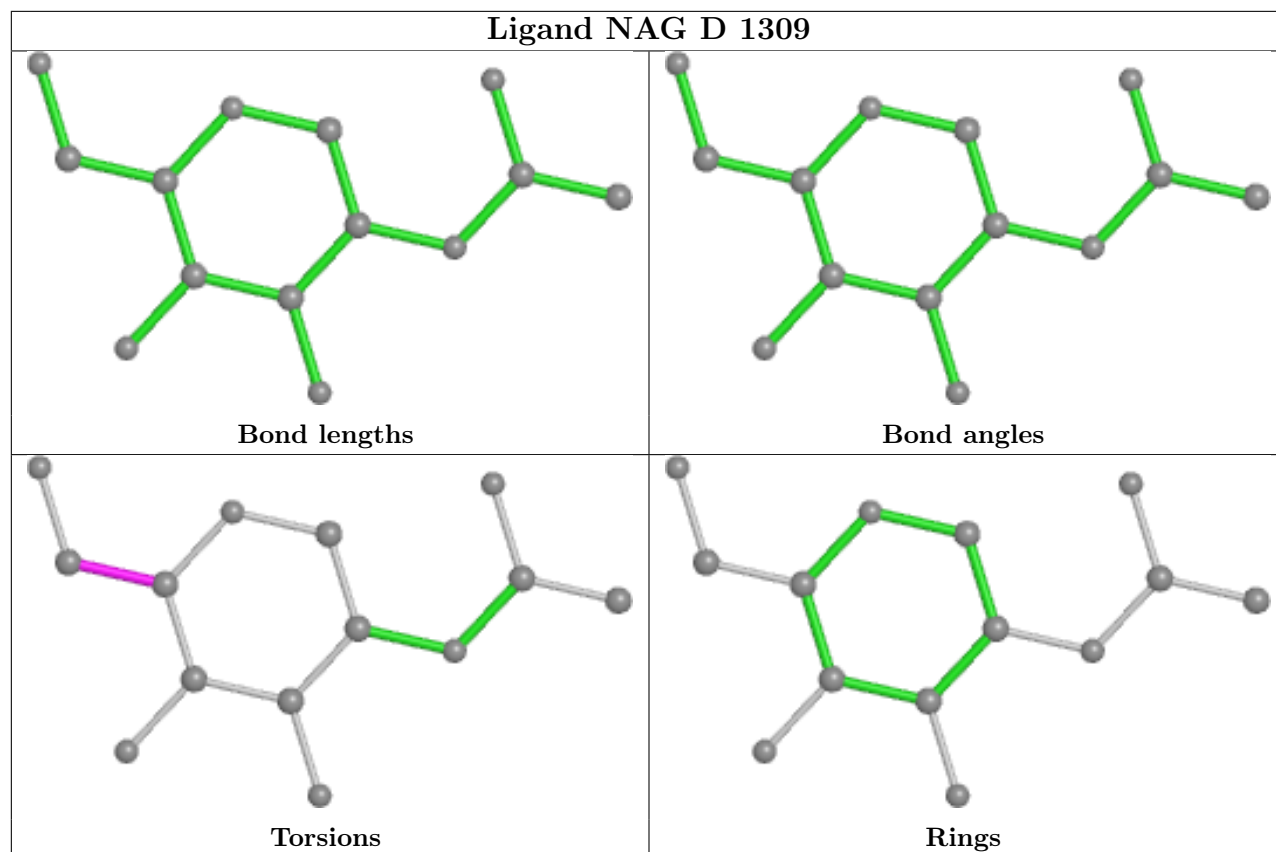
There are no ring outliers.

6 monomers are involved in 24 short contacts:

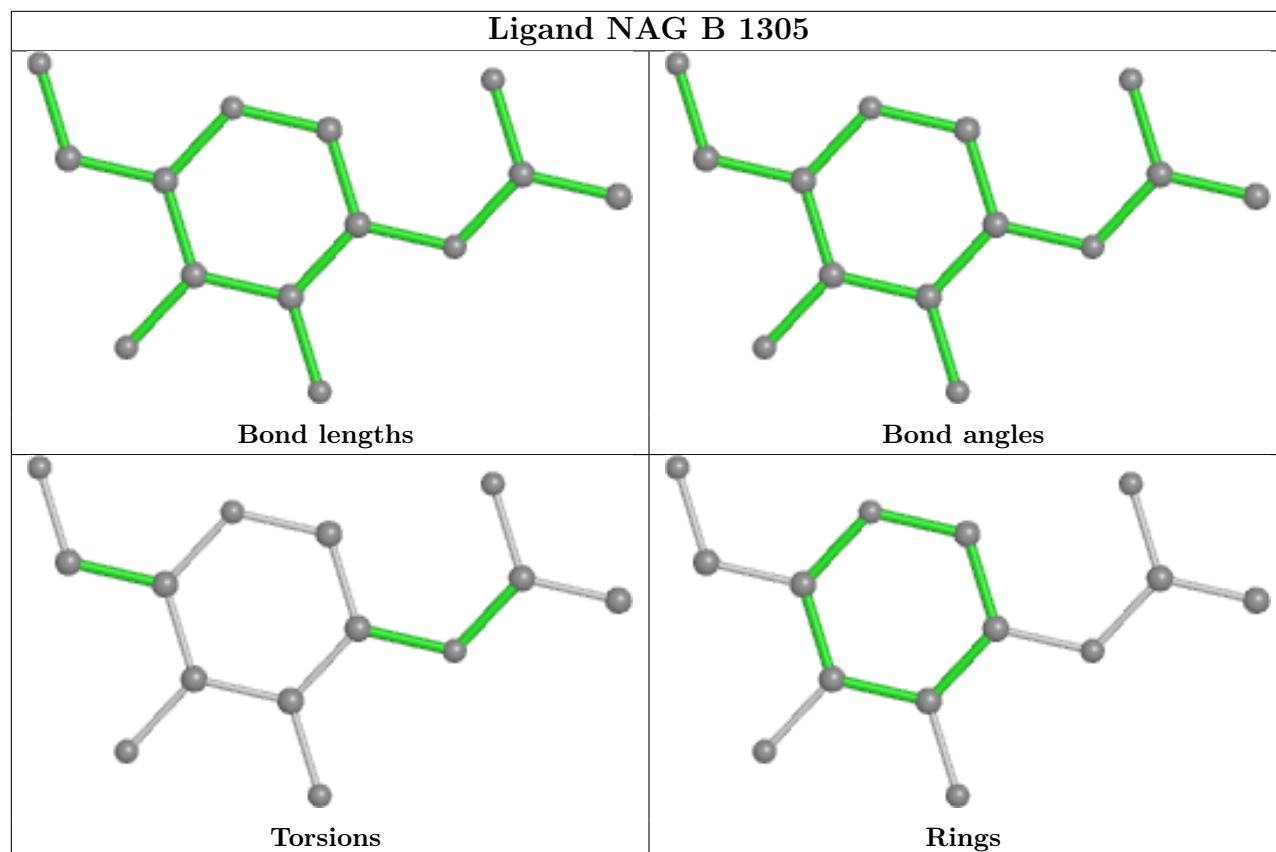
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	1310	REA	5	0
2	B	1303	NAG	1	0
2	D	1303	NAG	1	0
2	A	1303	NAG	1	0
3	D	1310	REA	9	0
3	B	1310	REA	7	0

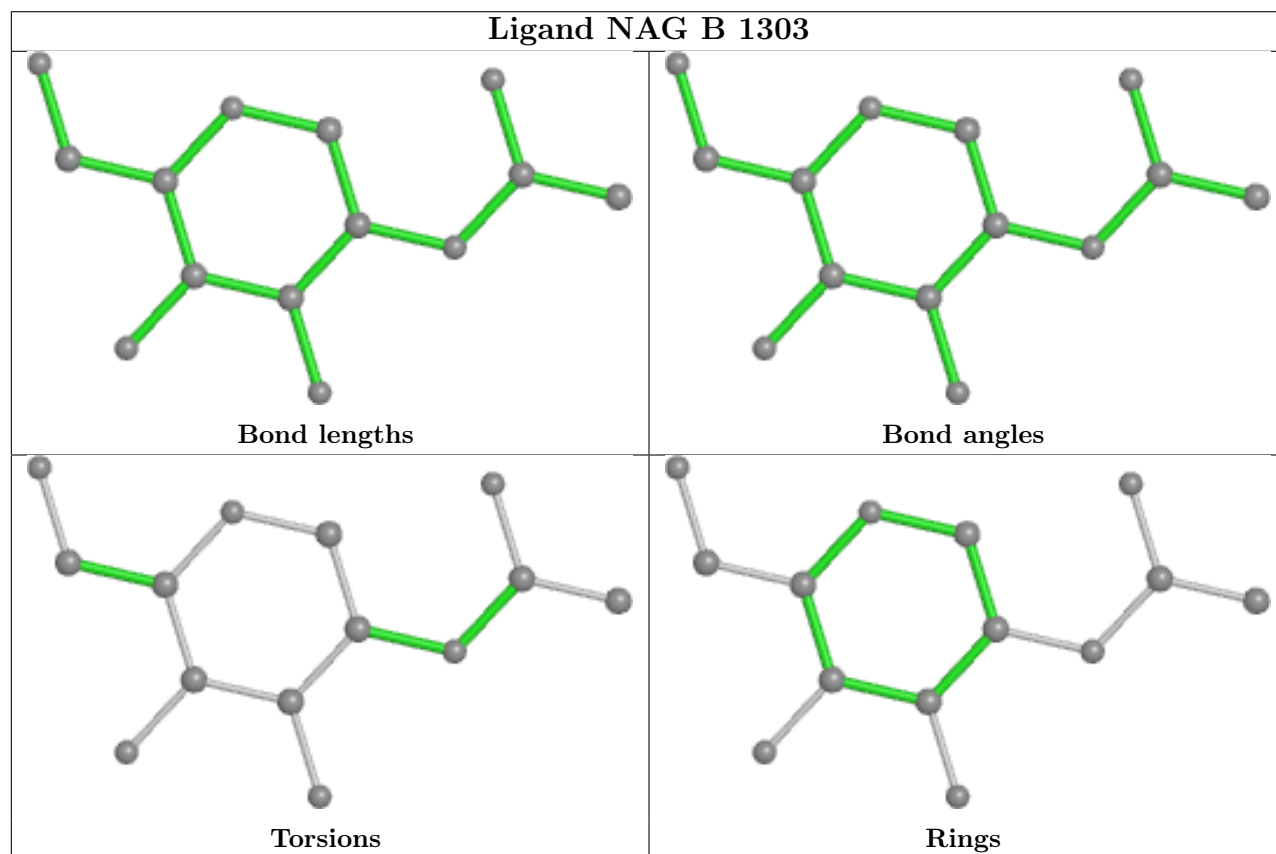
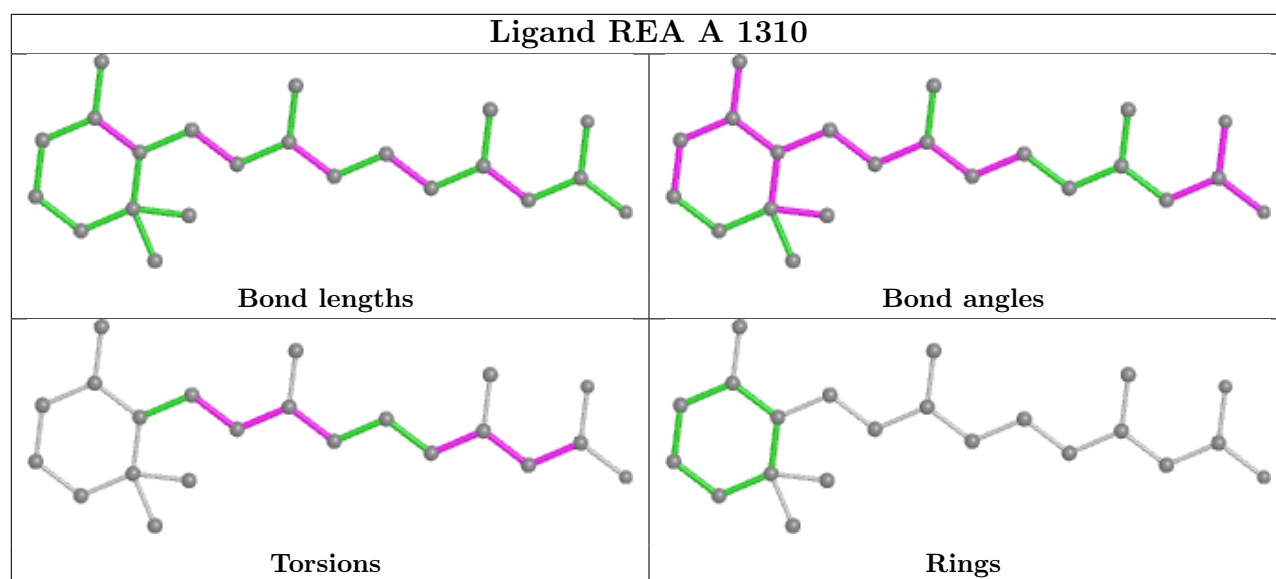
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. 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 NAG D 1309

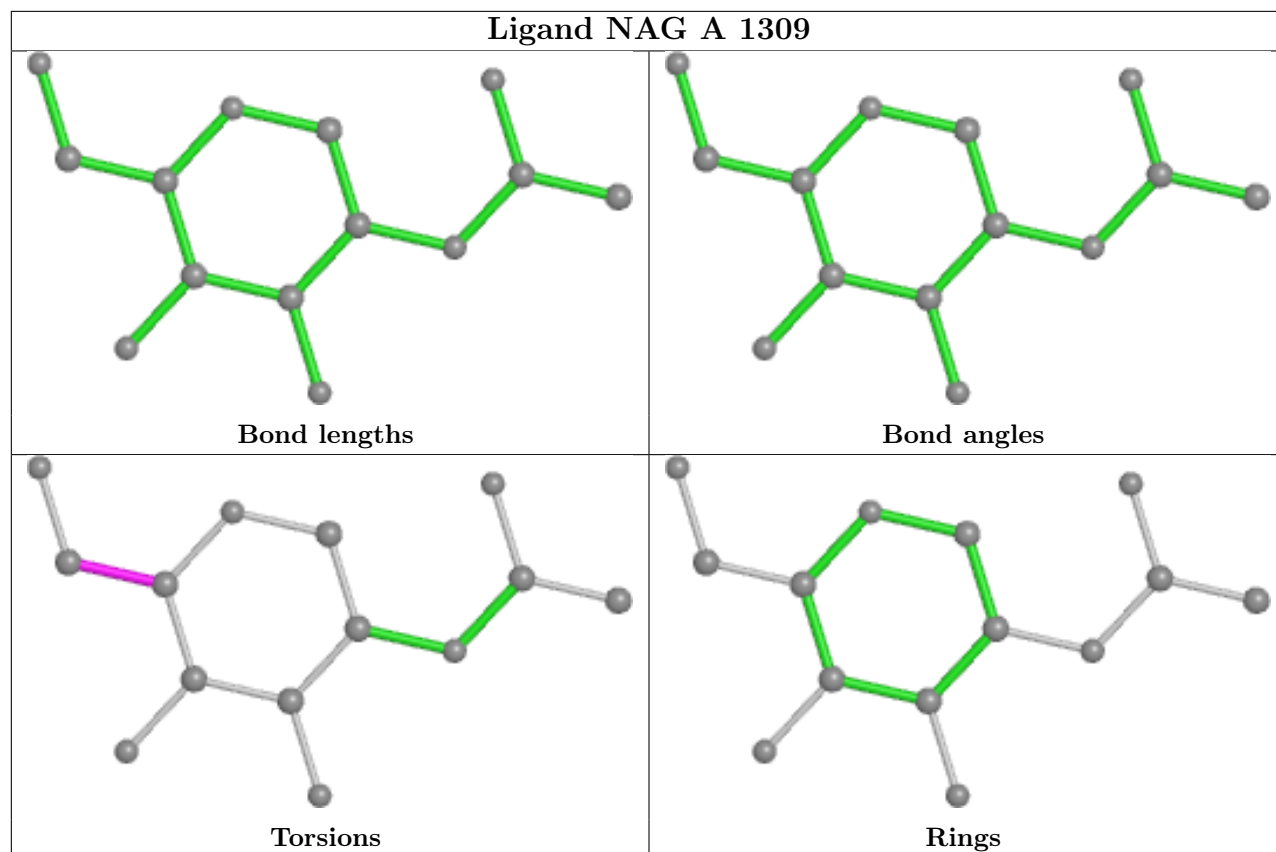


Ligand NAG B 1305

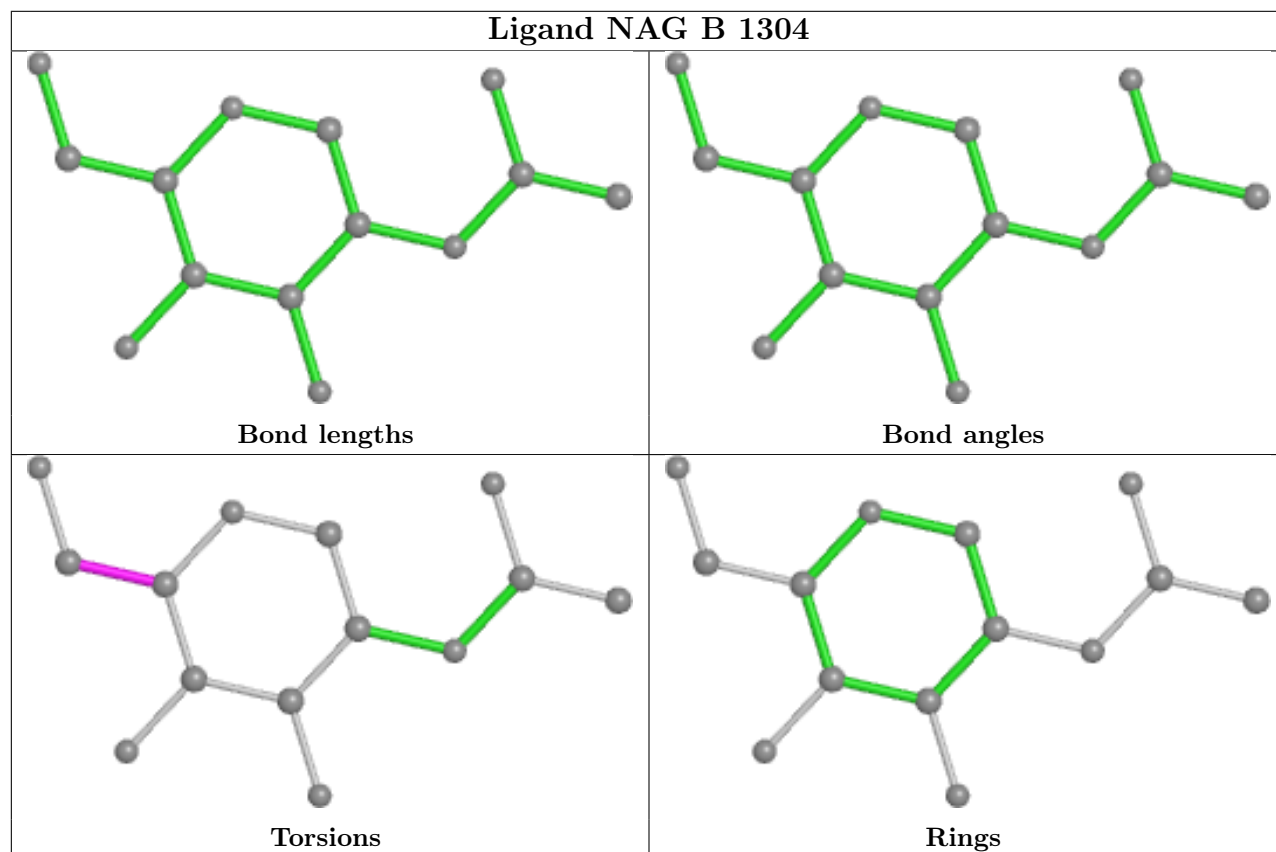


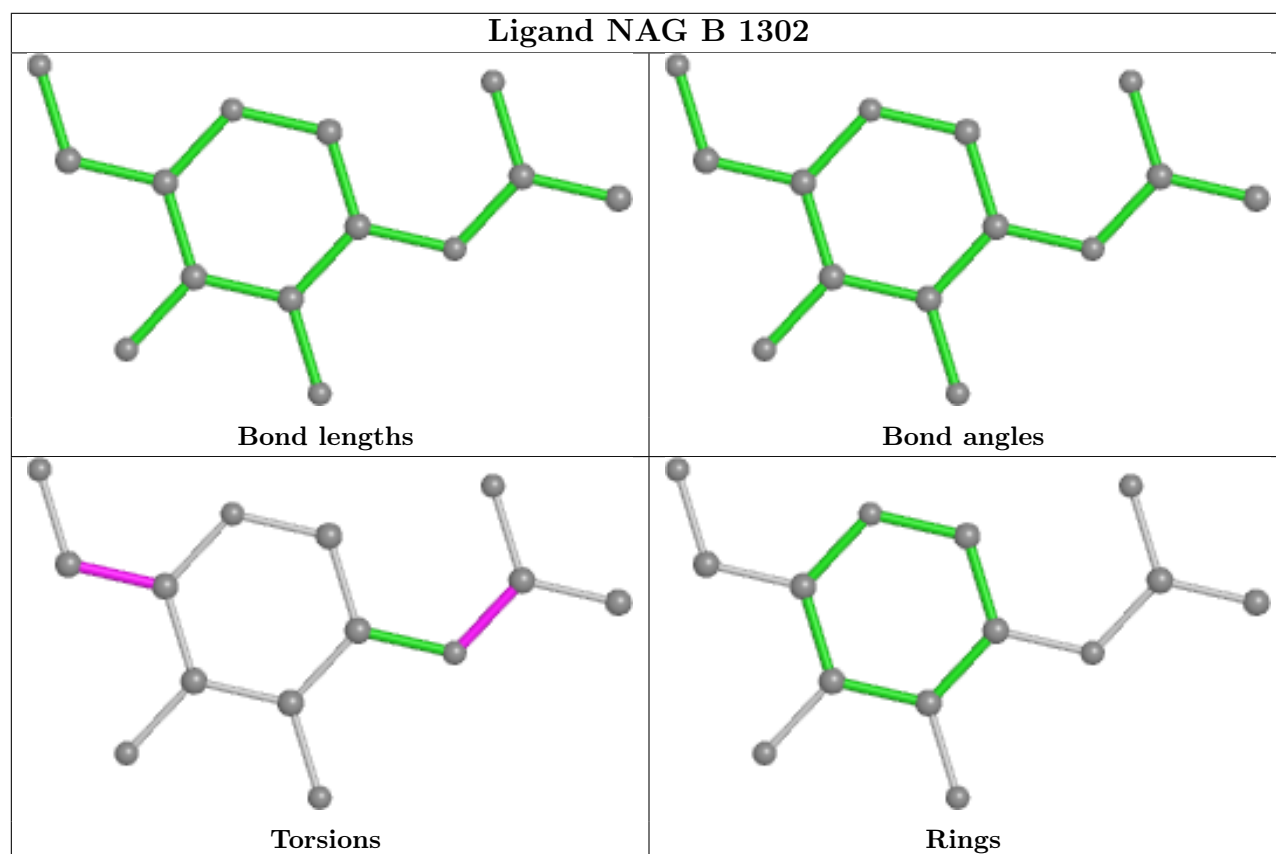
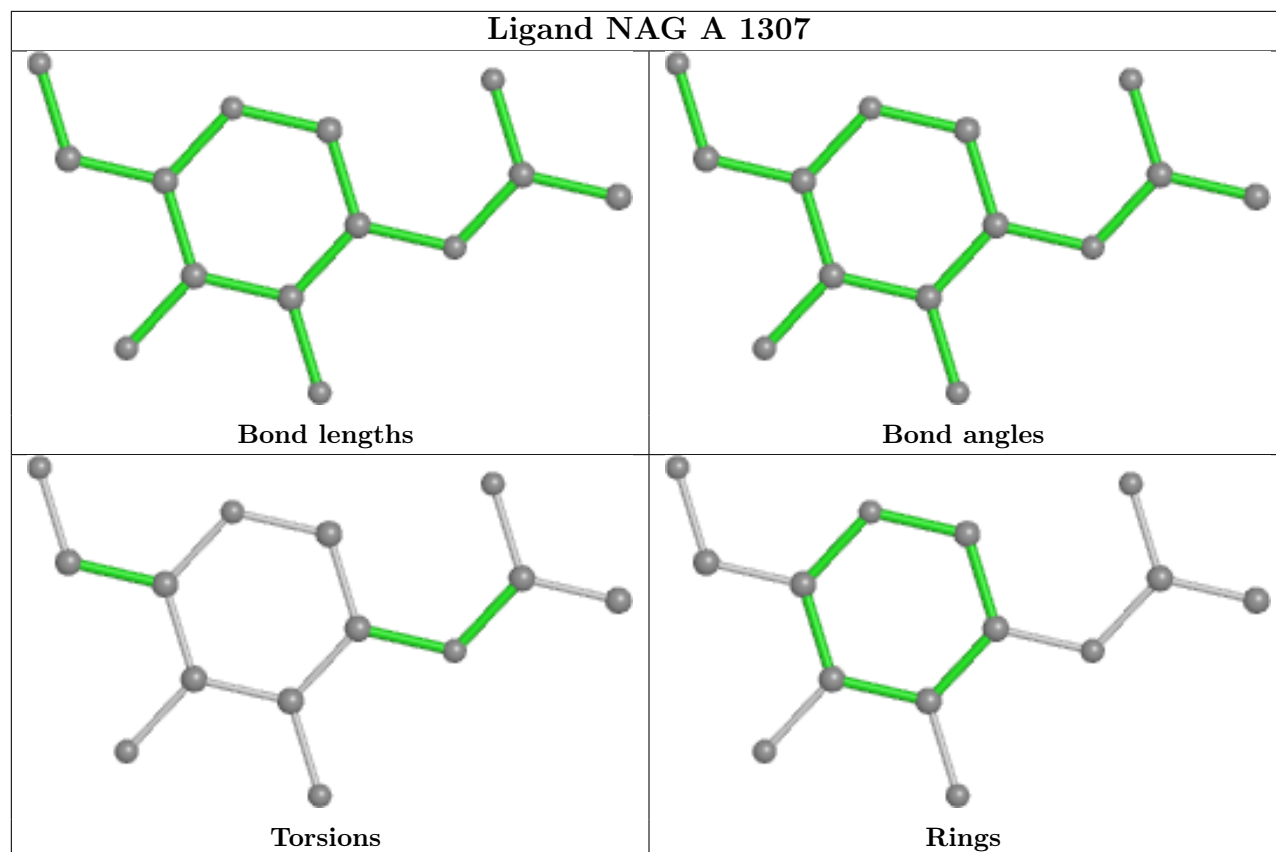


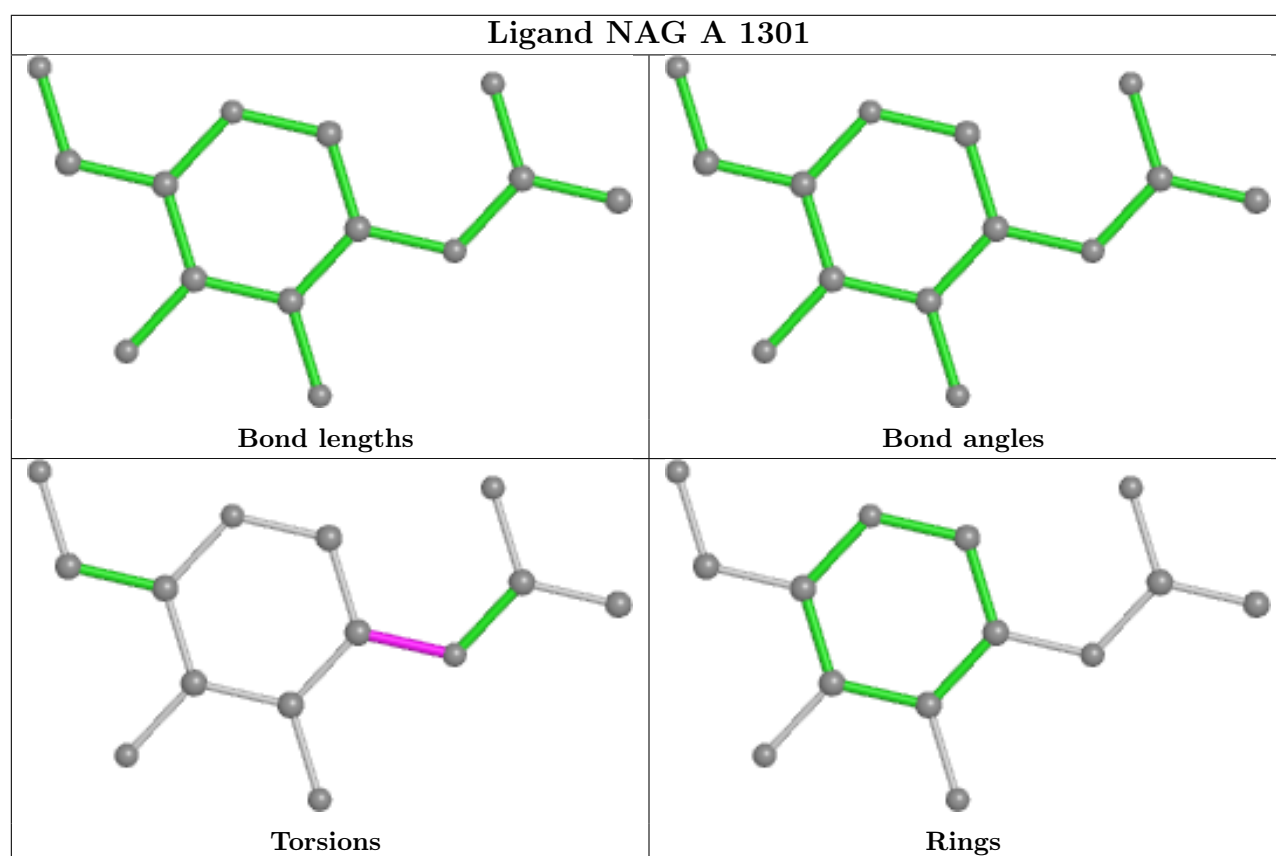
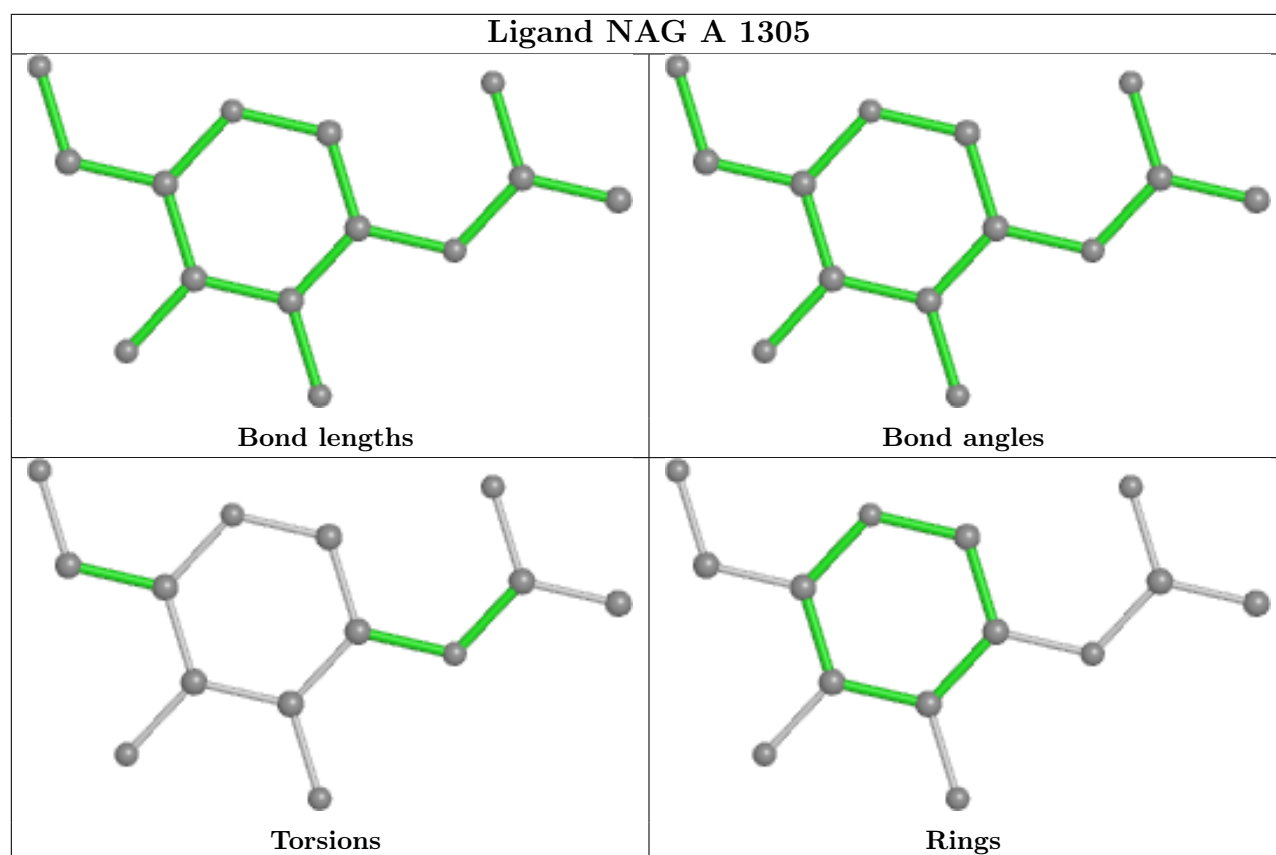
Ligand NAG A 1309

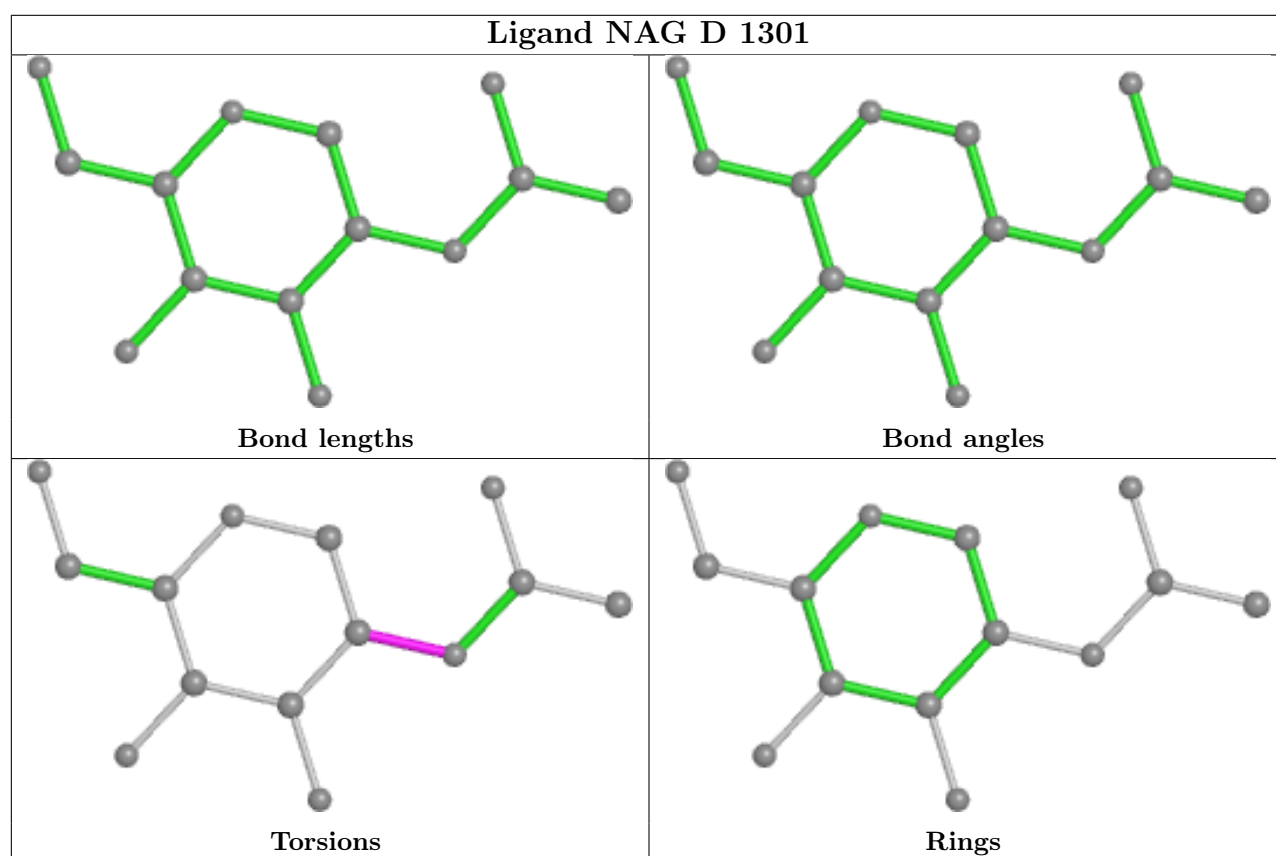
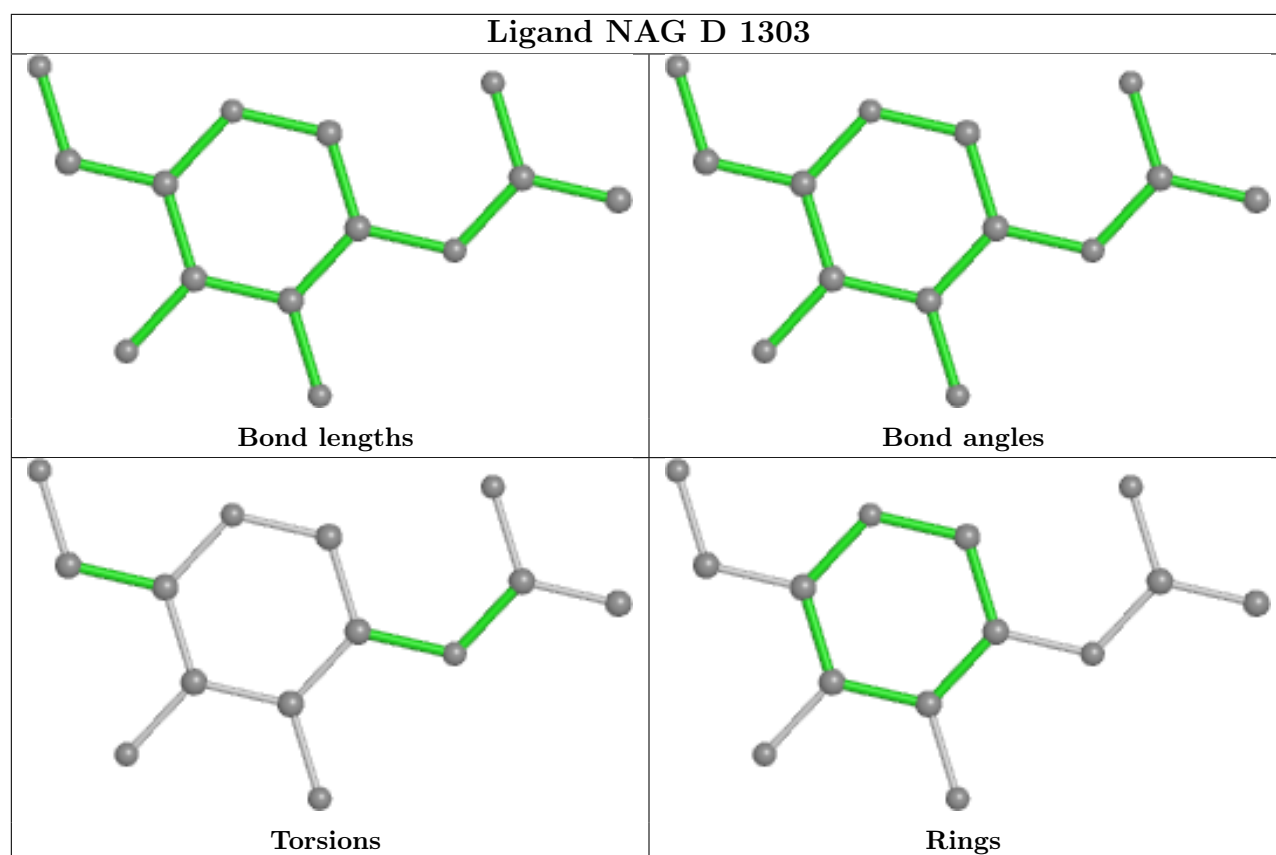


Ligand NAG B 1304

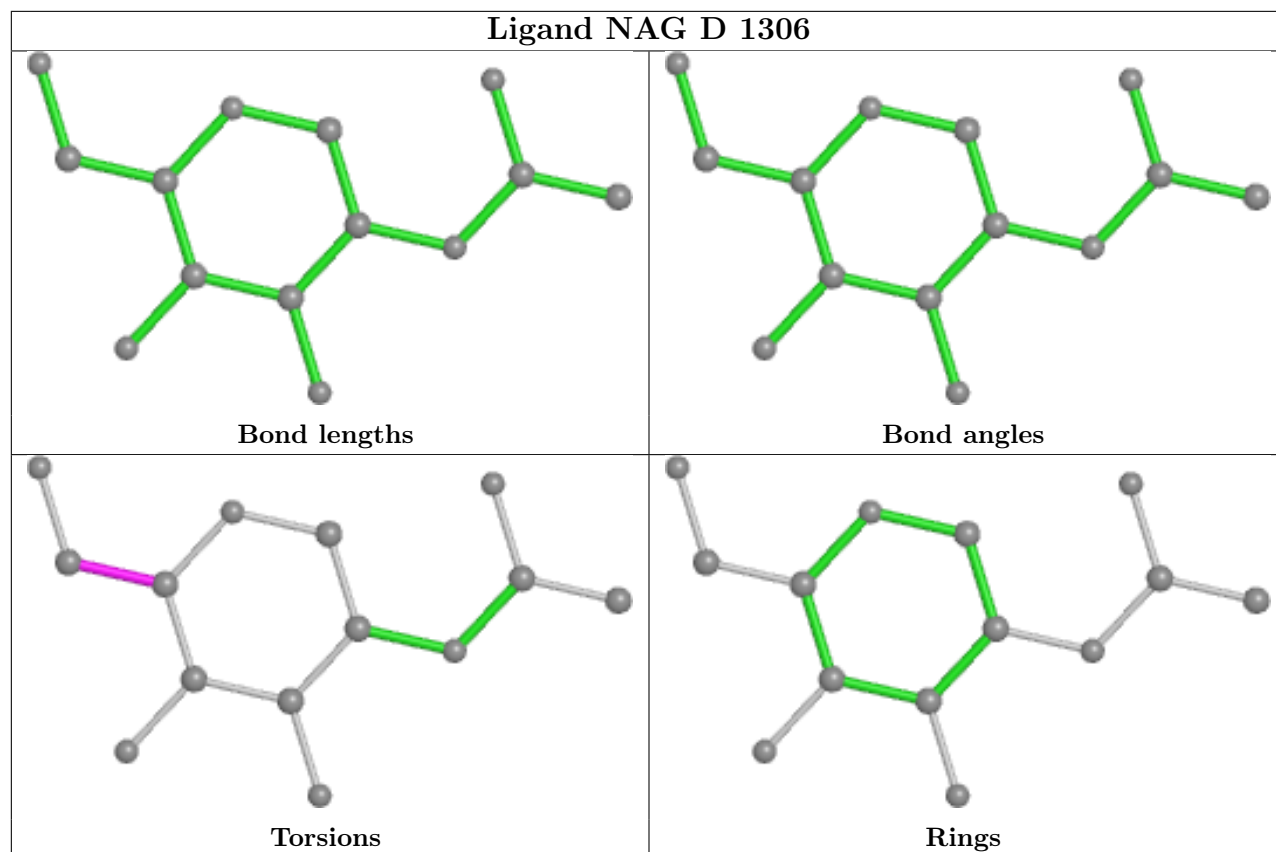




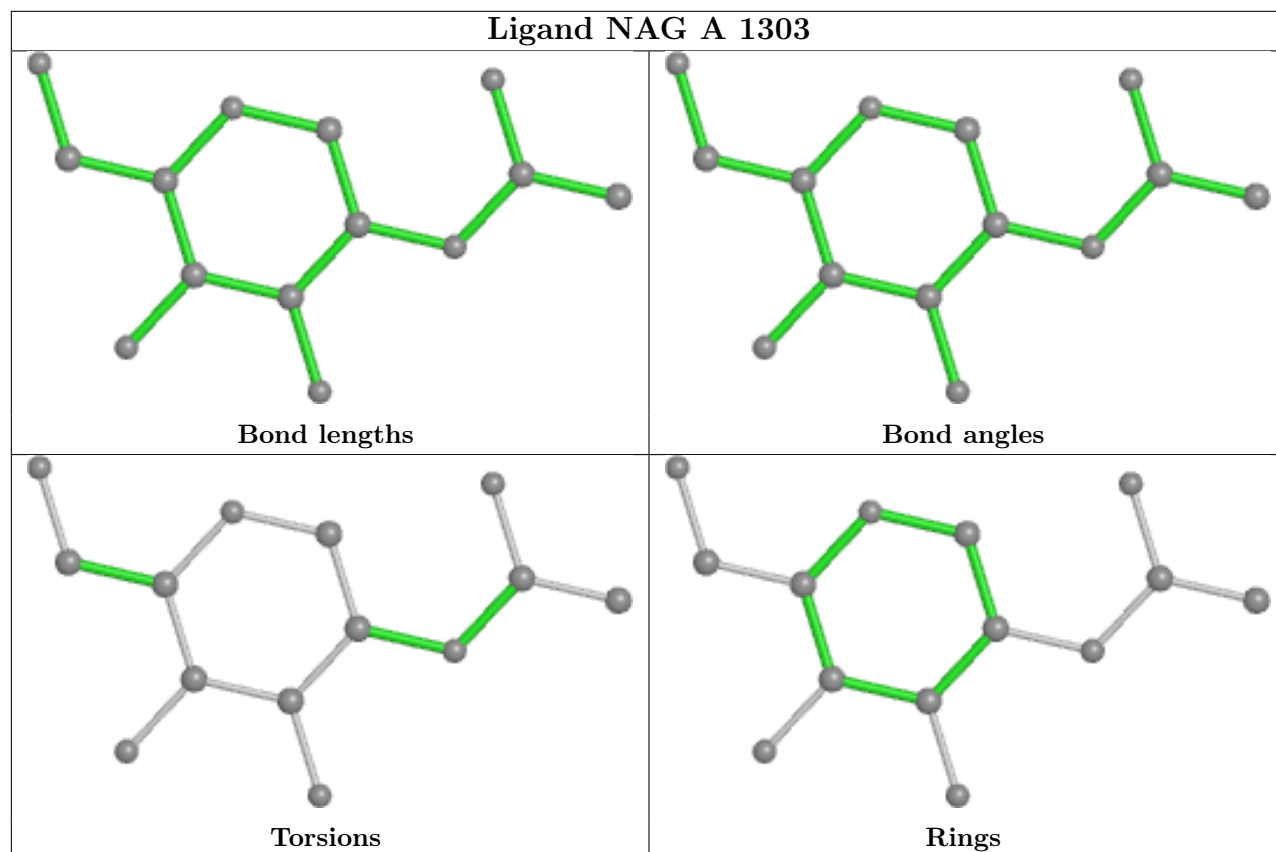


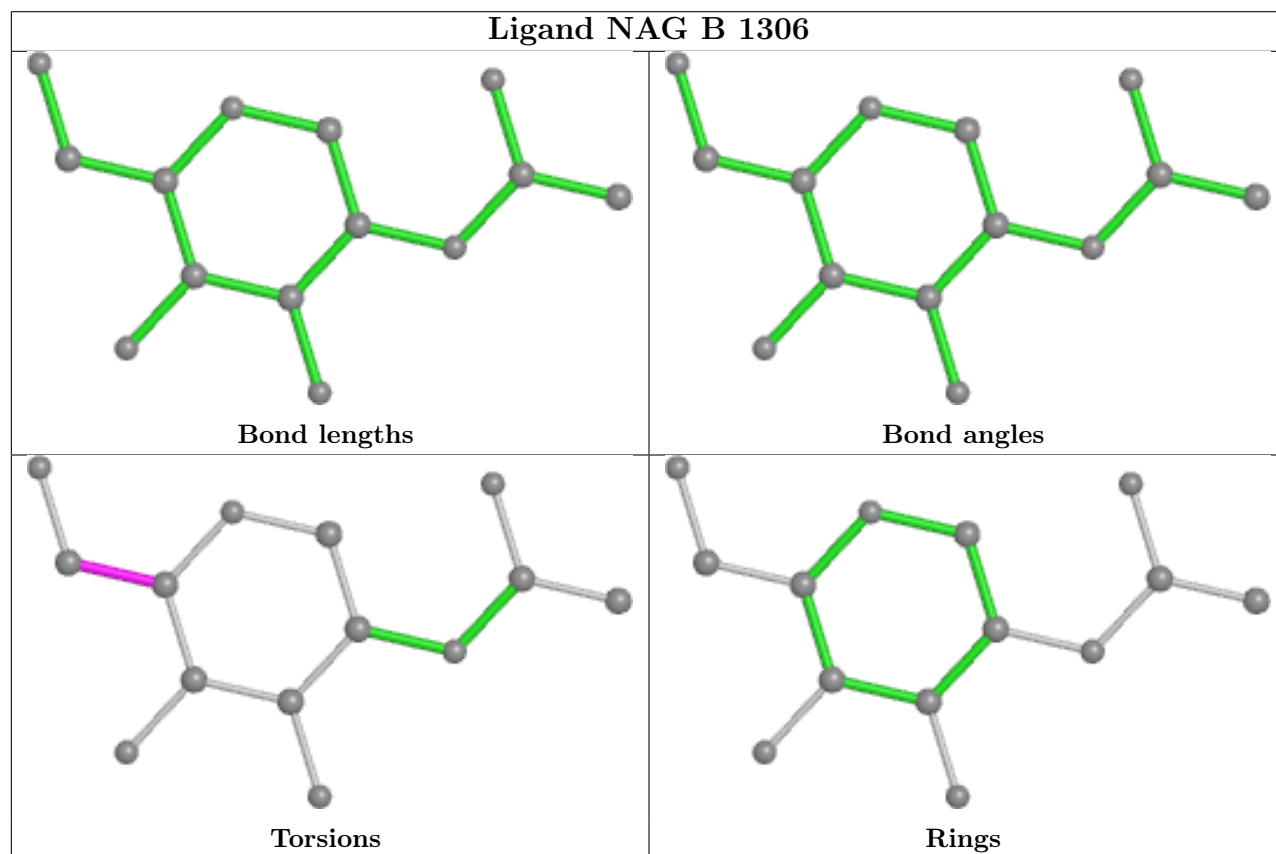
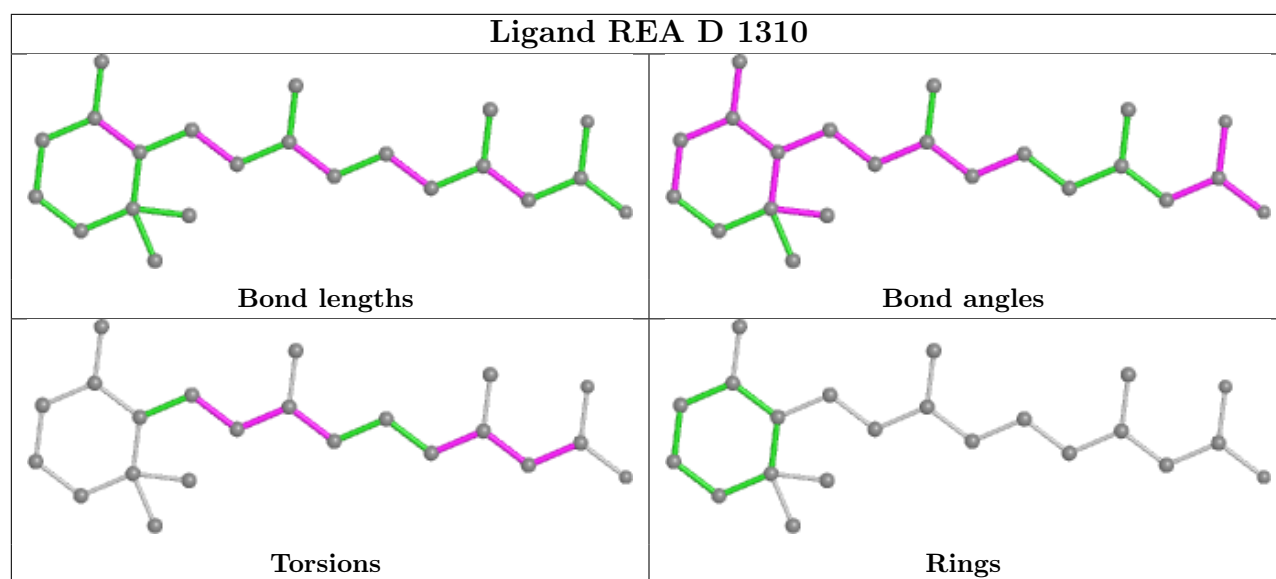


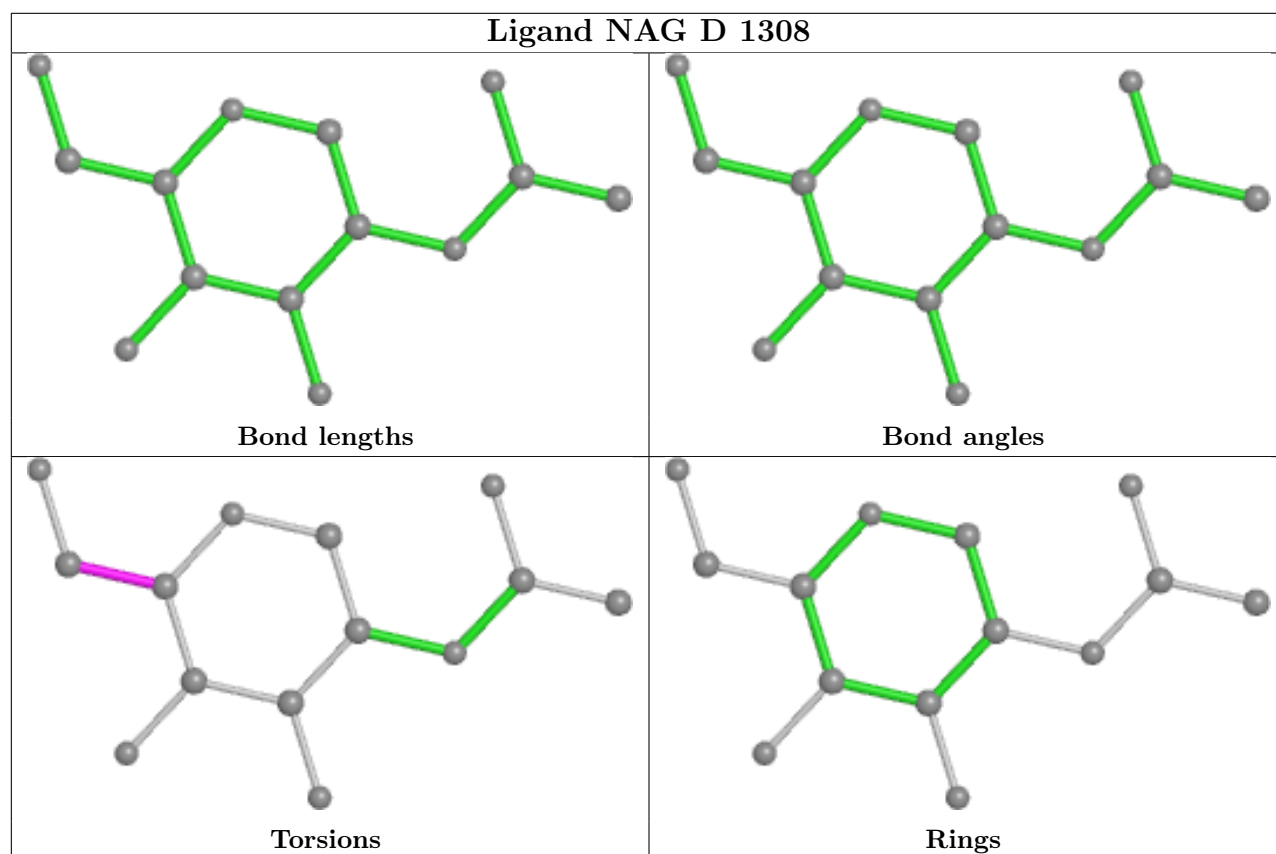
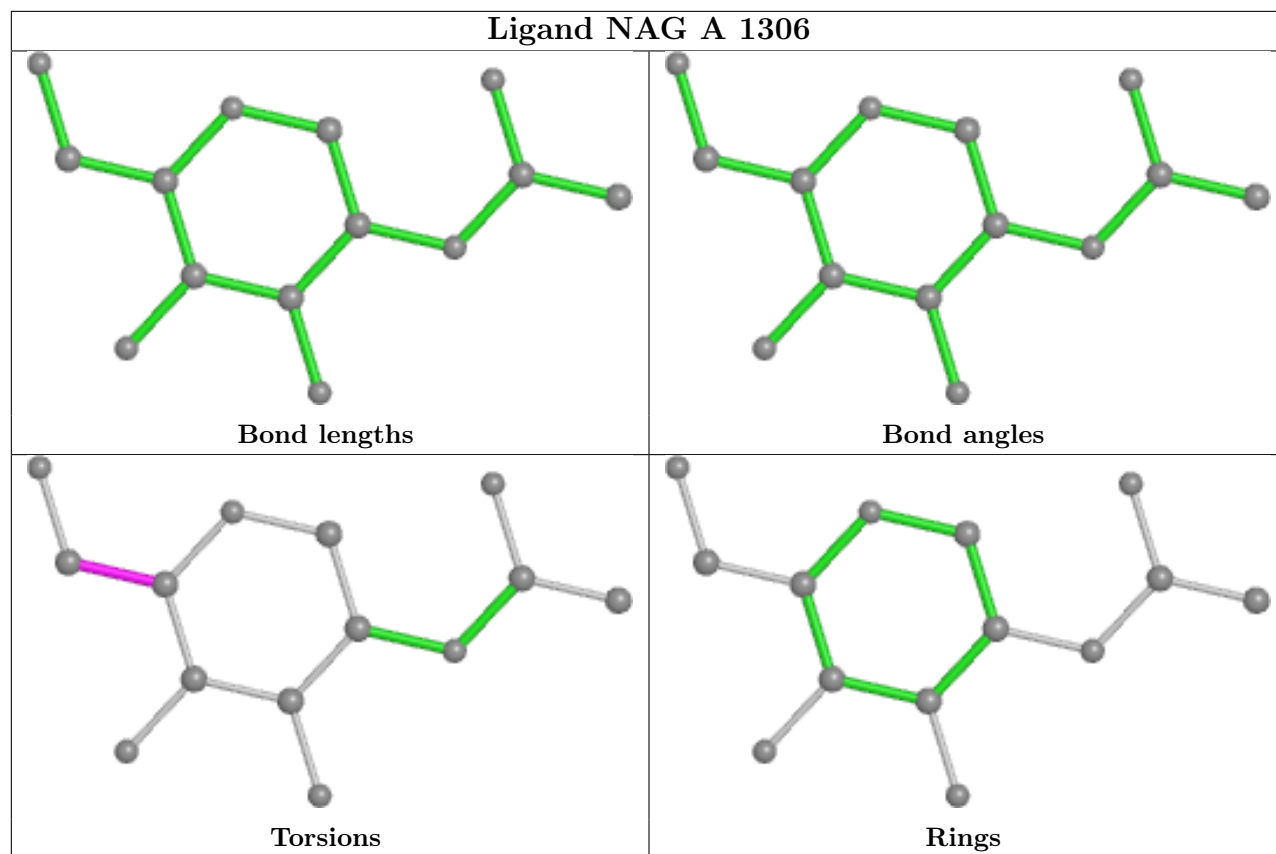
Ligand NAG D 1306

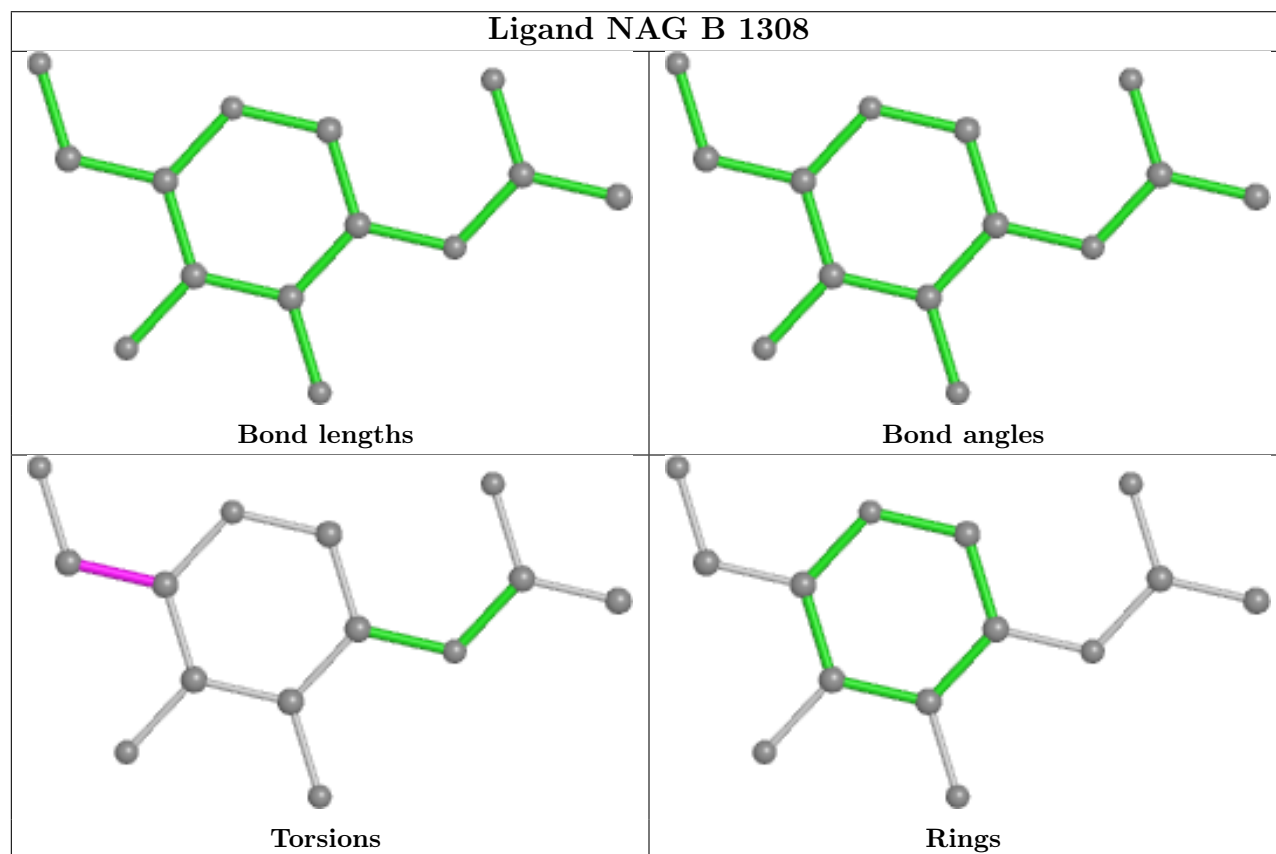
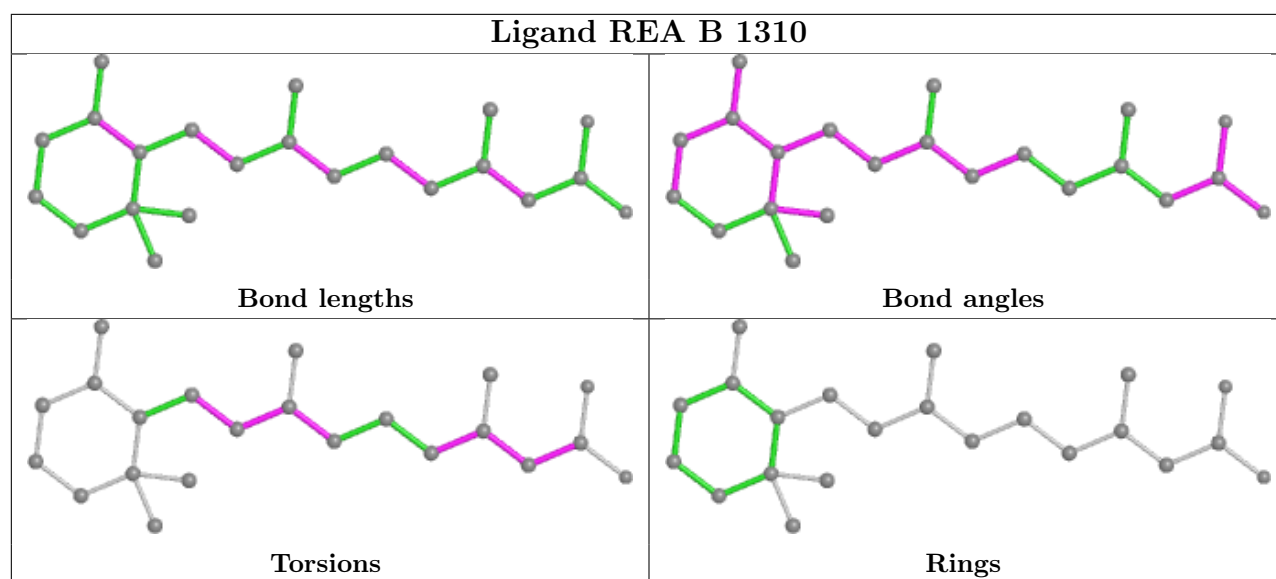


Ligand NAG A 1303

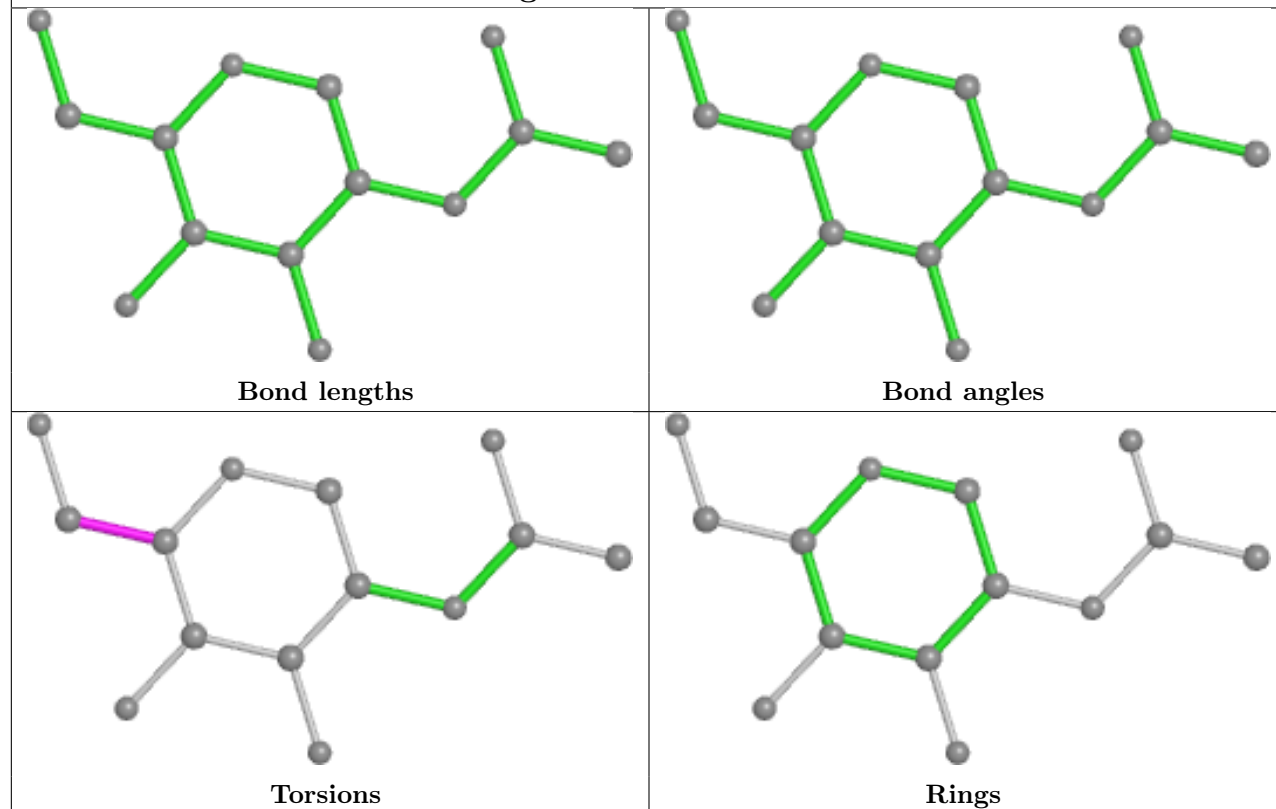




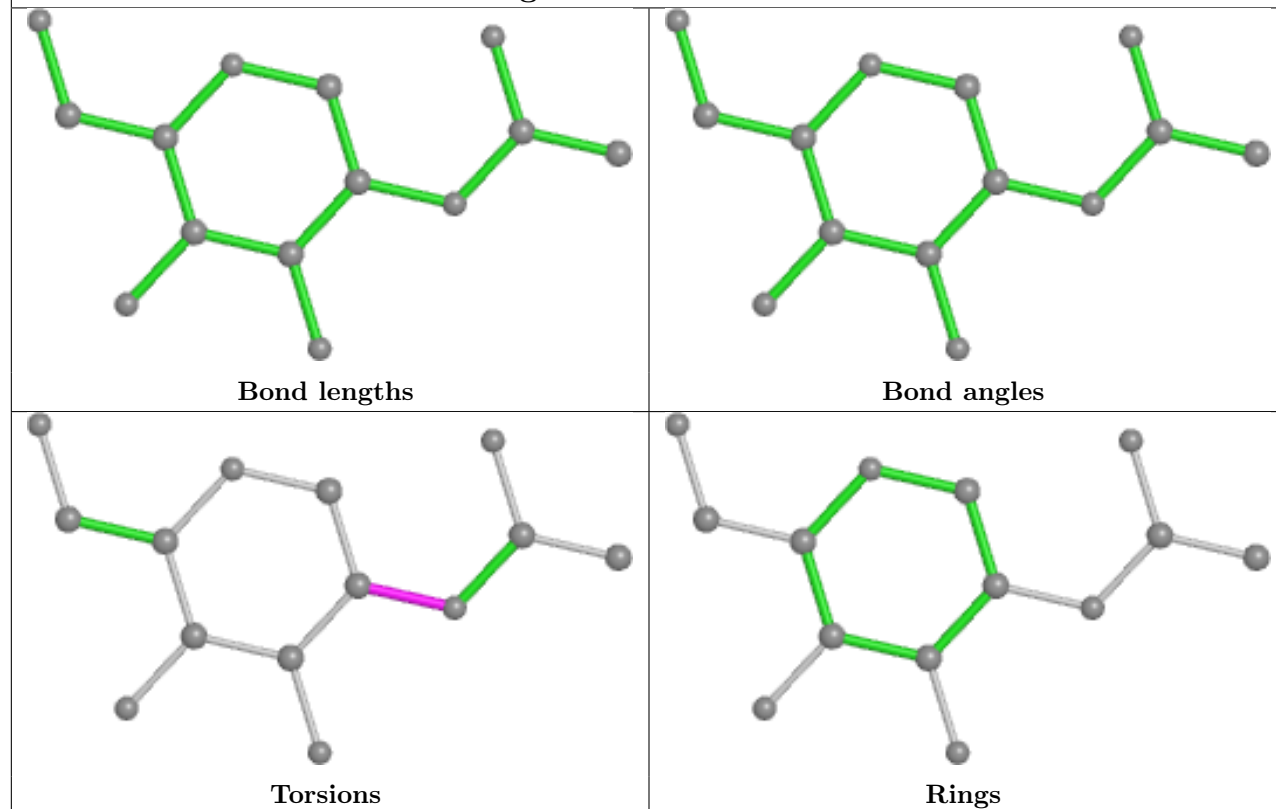


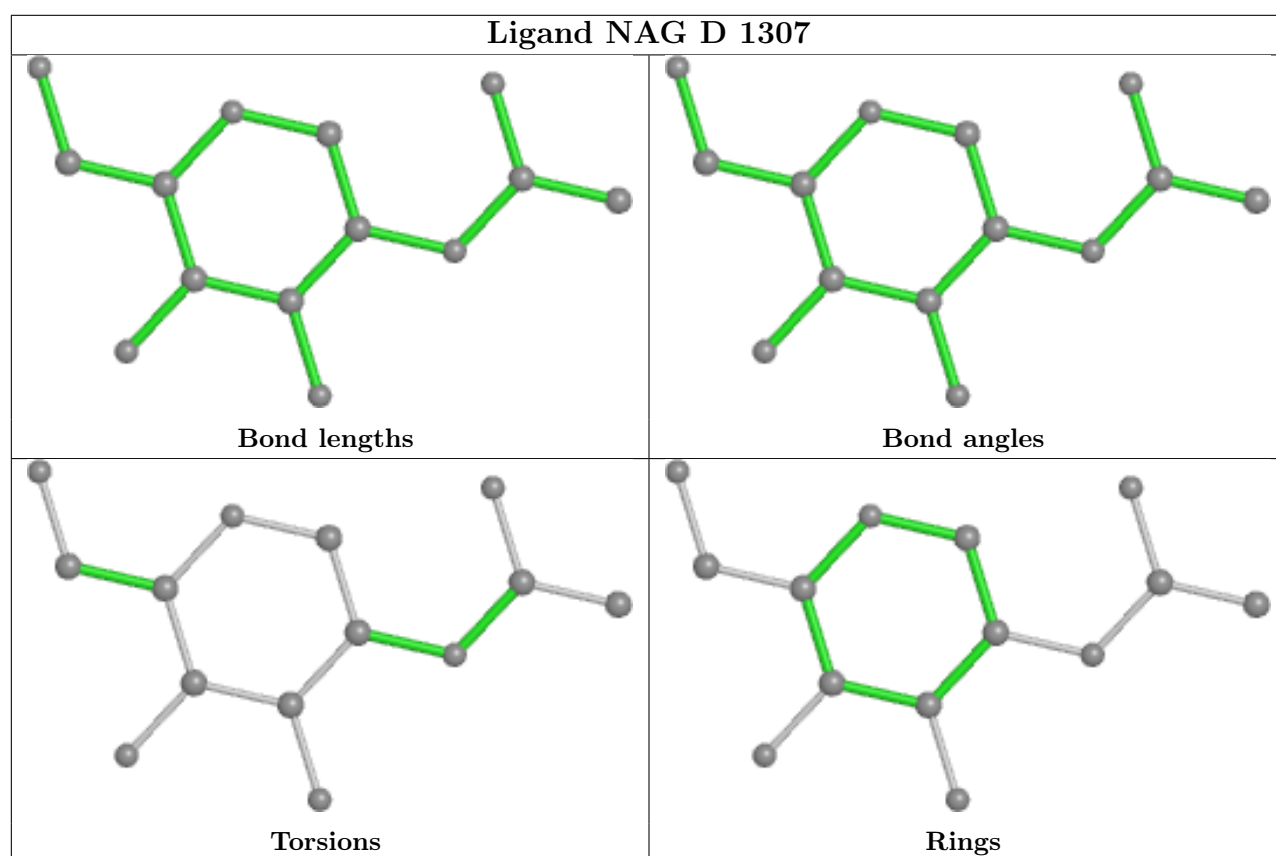
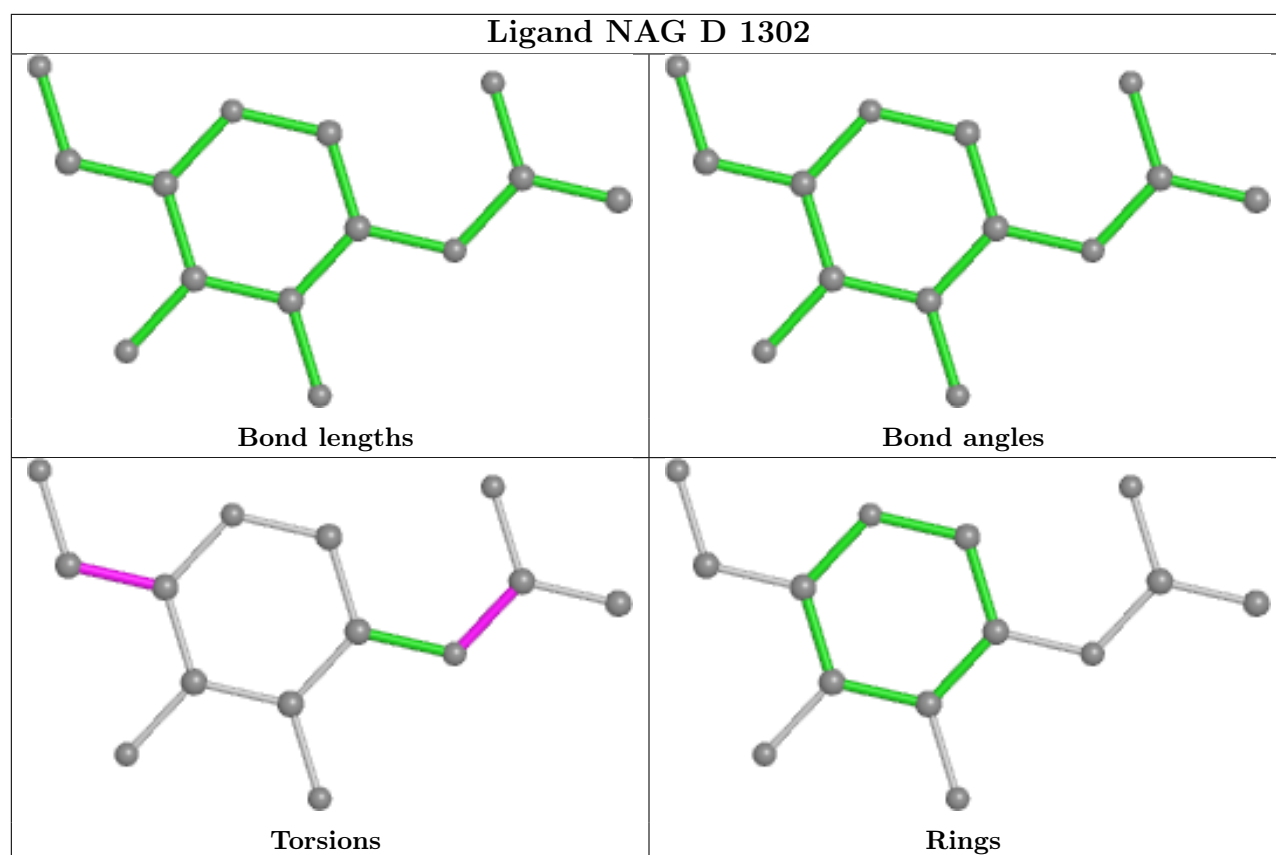


Ligand NAG B 1309

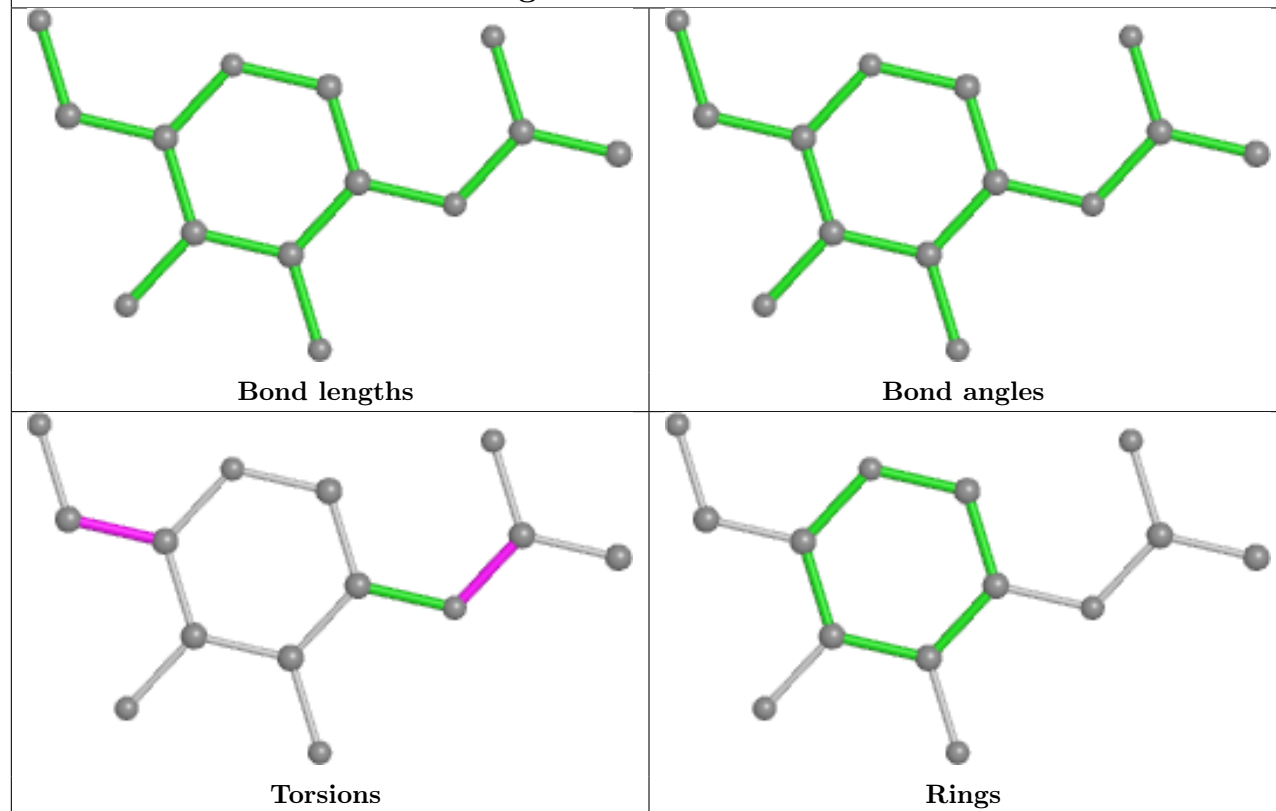


Ligand NAG B 1301

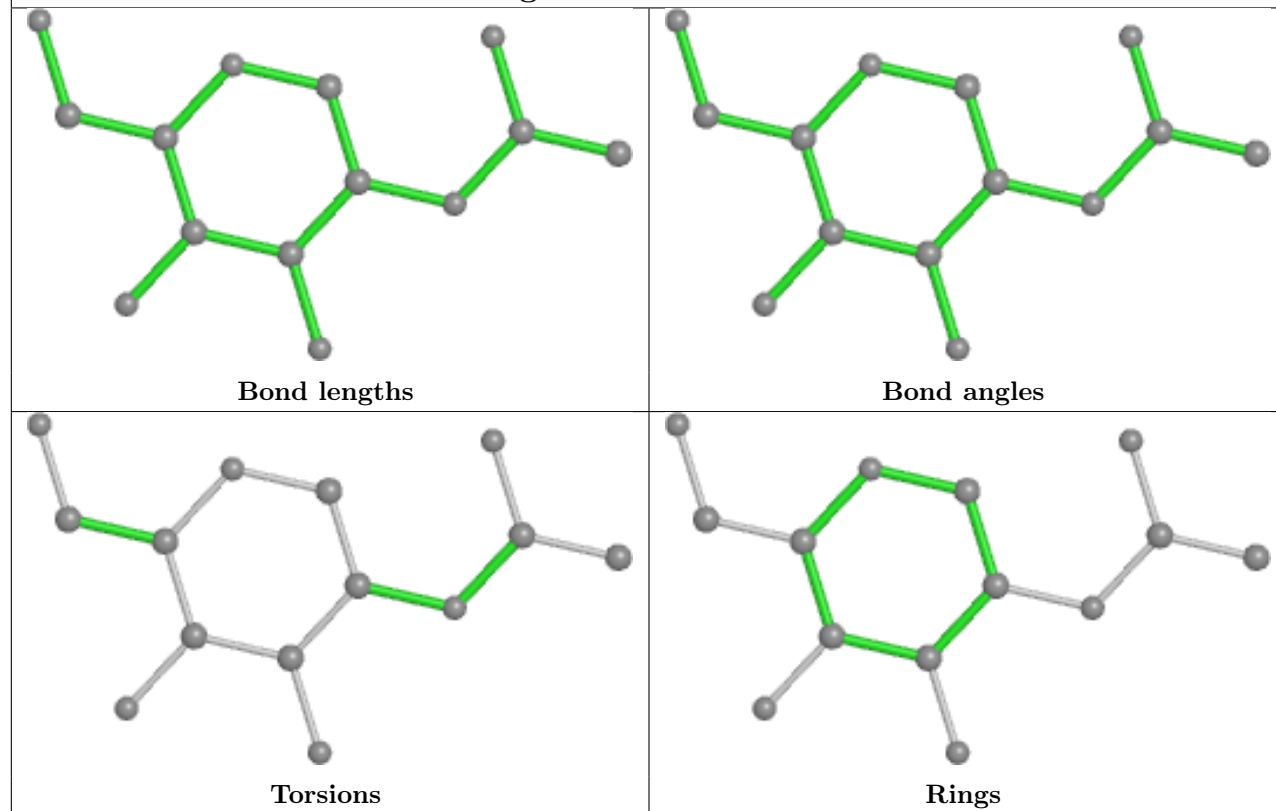




Ligand NAG A 1302



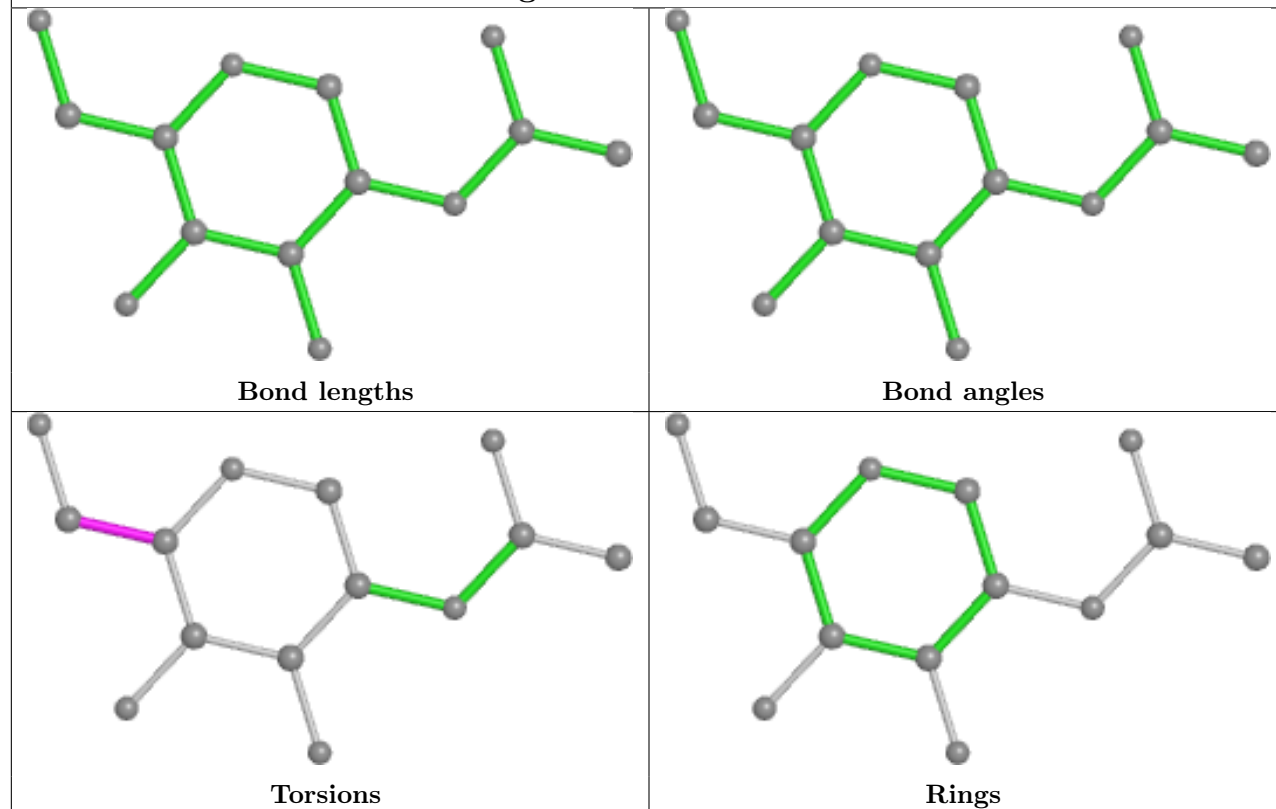
Ligand NAG B 1307

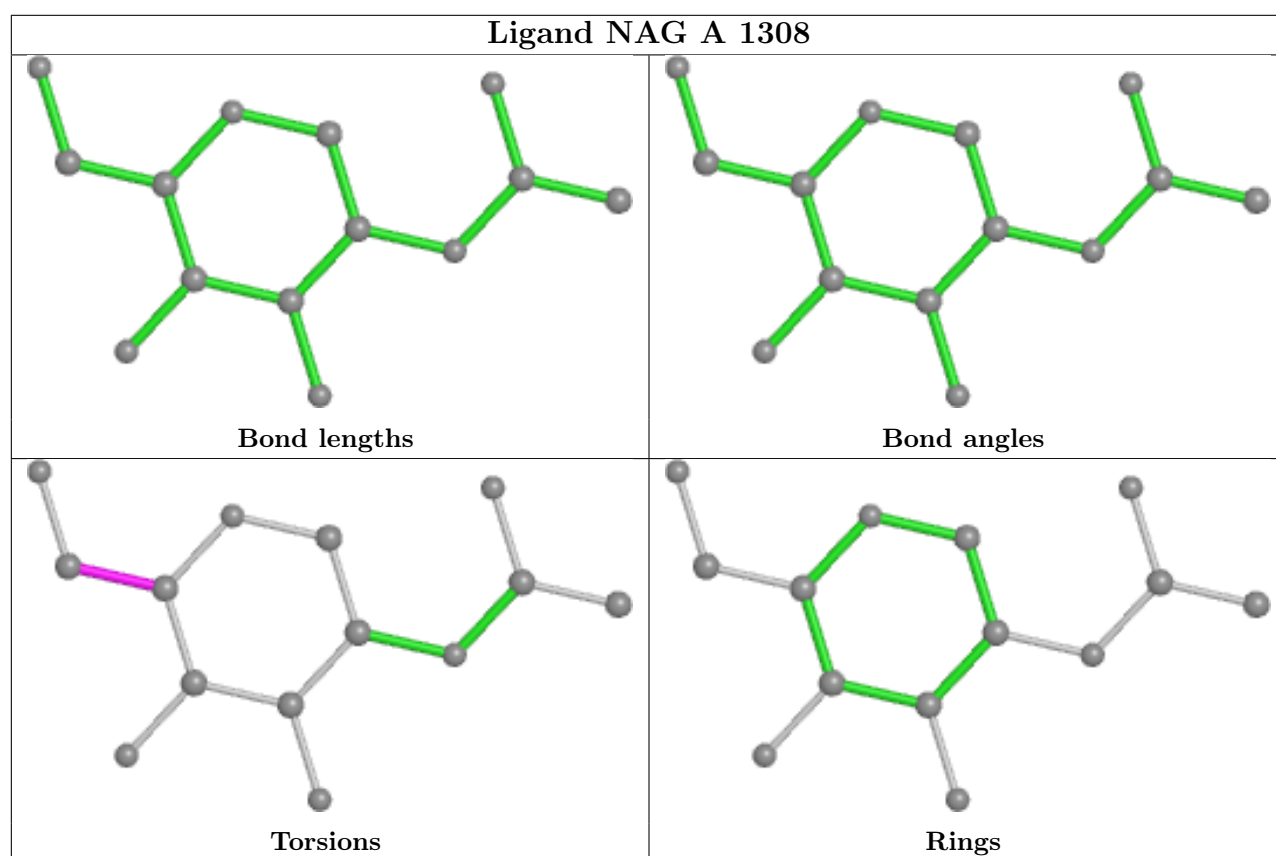
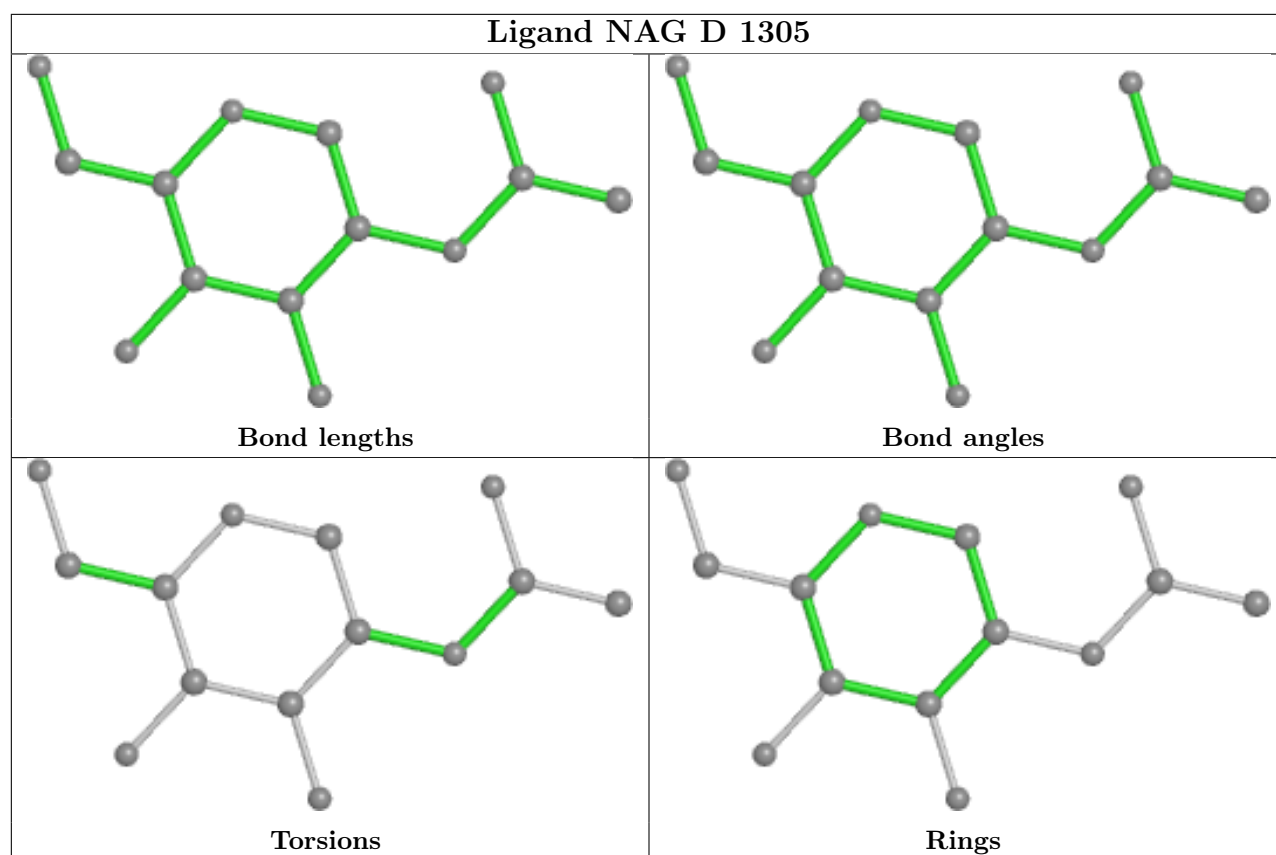


Ligand NAG A 1304



Ligand NAG D 1304





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.

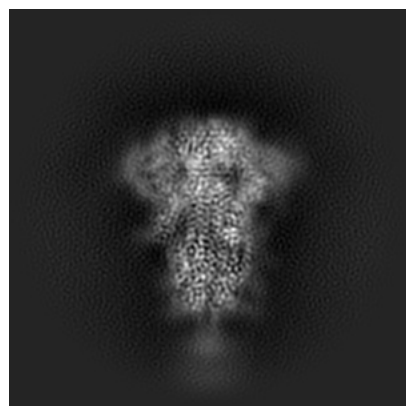
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-33600. These allow visual inspection of the internal detail of the map and identification of artifacts.

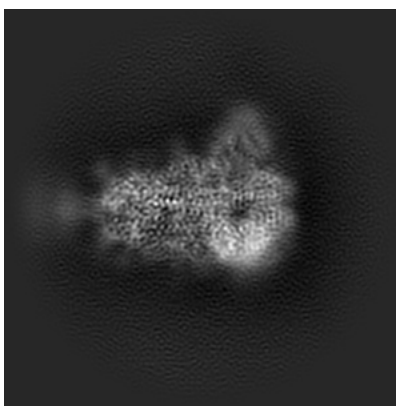
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

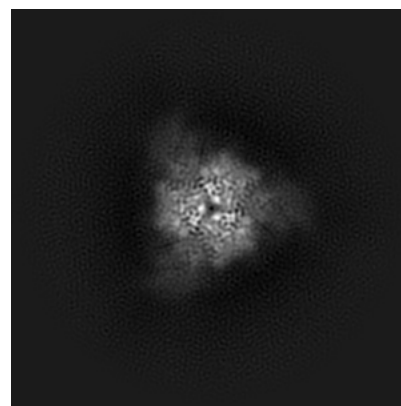
6.1.1 Primary map



X

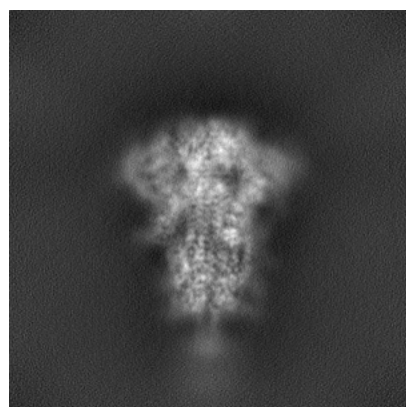


Y

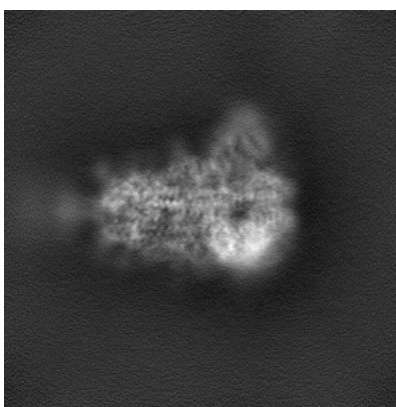


Z

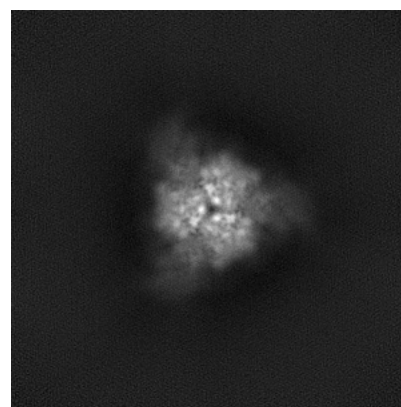
6.1.2 Raw map



X



Y

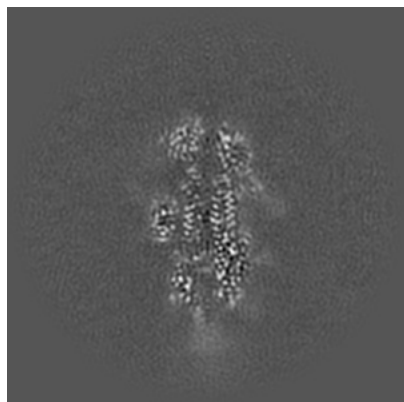


Z

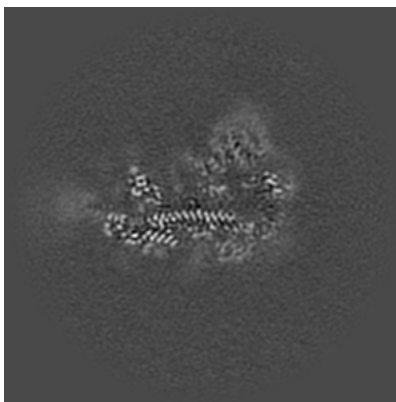
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

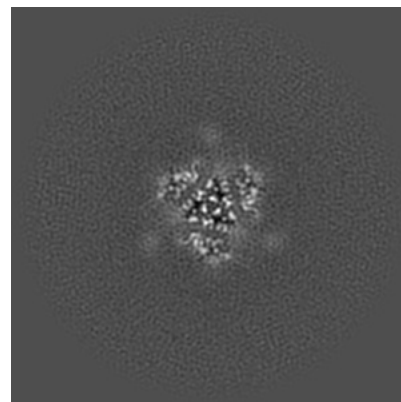
6.2.1 Primary map



X Index: 160

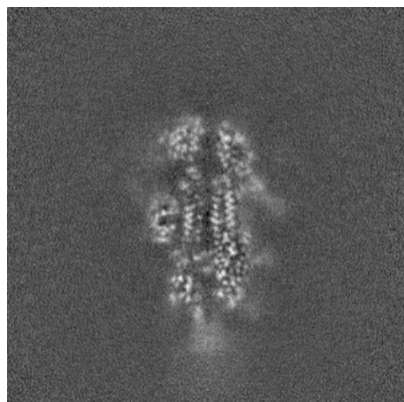


Y Index: 160

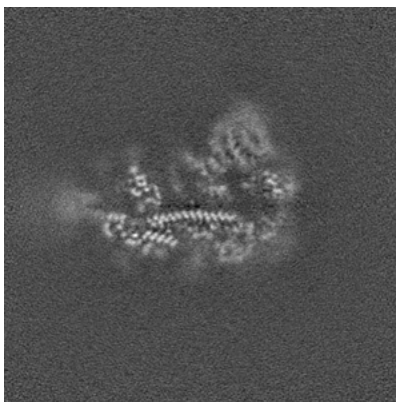


Z Index: 160

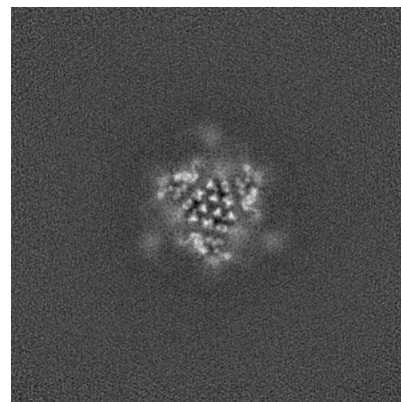
6.2.2 Raw map



X Index: 160



Y Index: 160

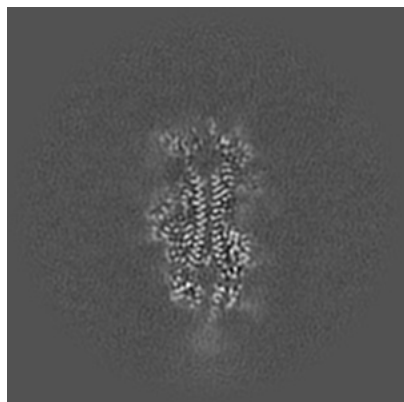


Z Index: 160

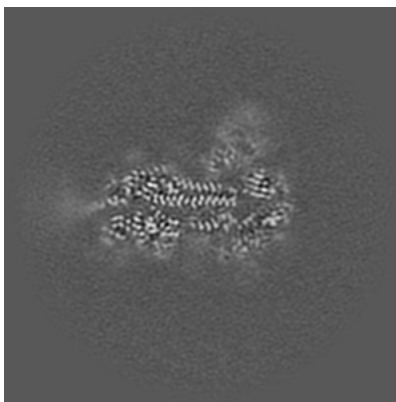
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

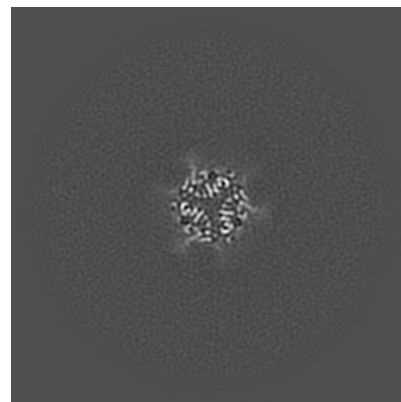
6.3.1 Primary map



X Index: 165

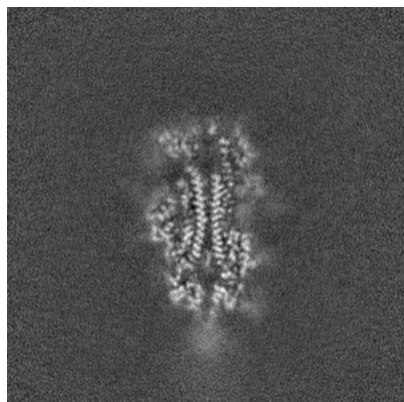


Y Index: 153

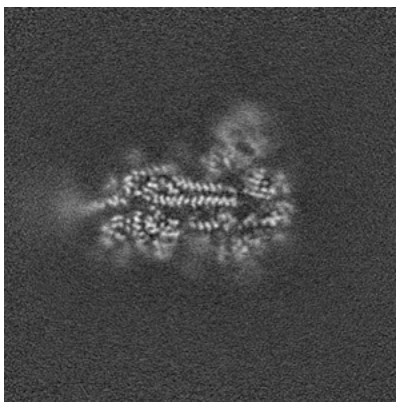


Z Index: 105

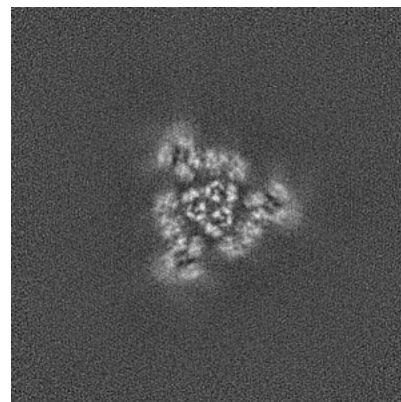
6.3.2 Raw map



X Index: 164



Y Index: 153

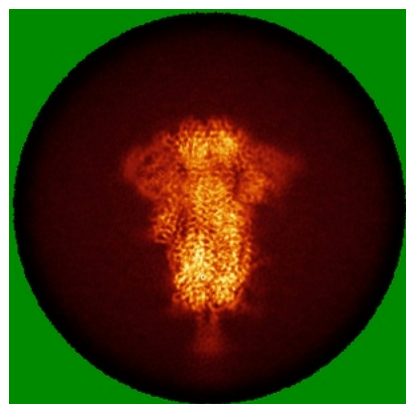


Z Index: 177

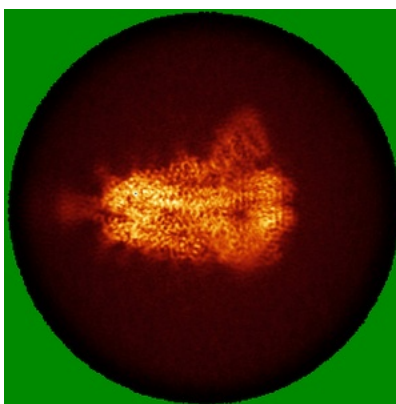
The images above show the largest variance slices of the map in three orthogonal directions.

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

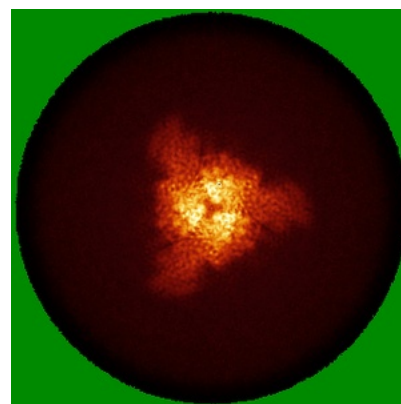
6.4.1 Primary map



X

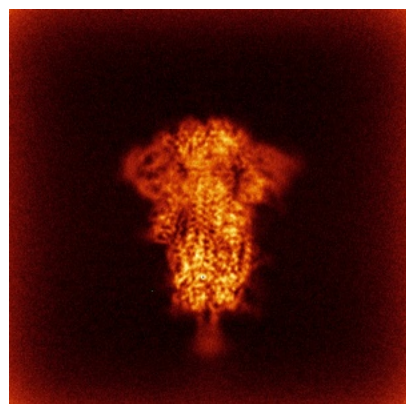


Y

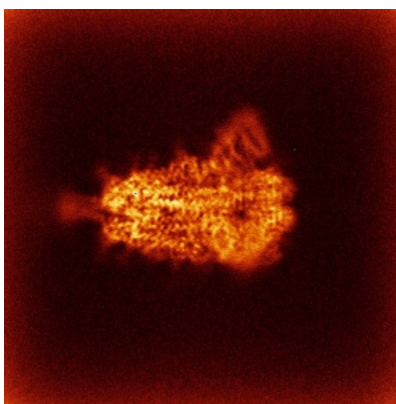


Z

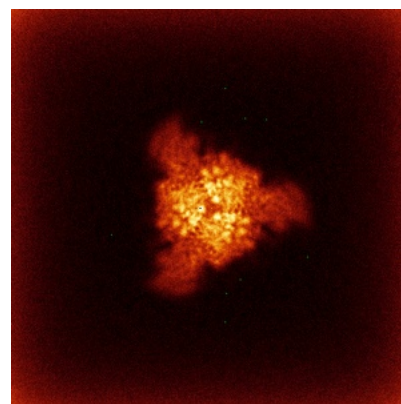
6.4.2 Raw map



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 0.175. 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.

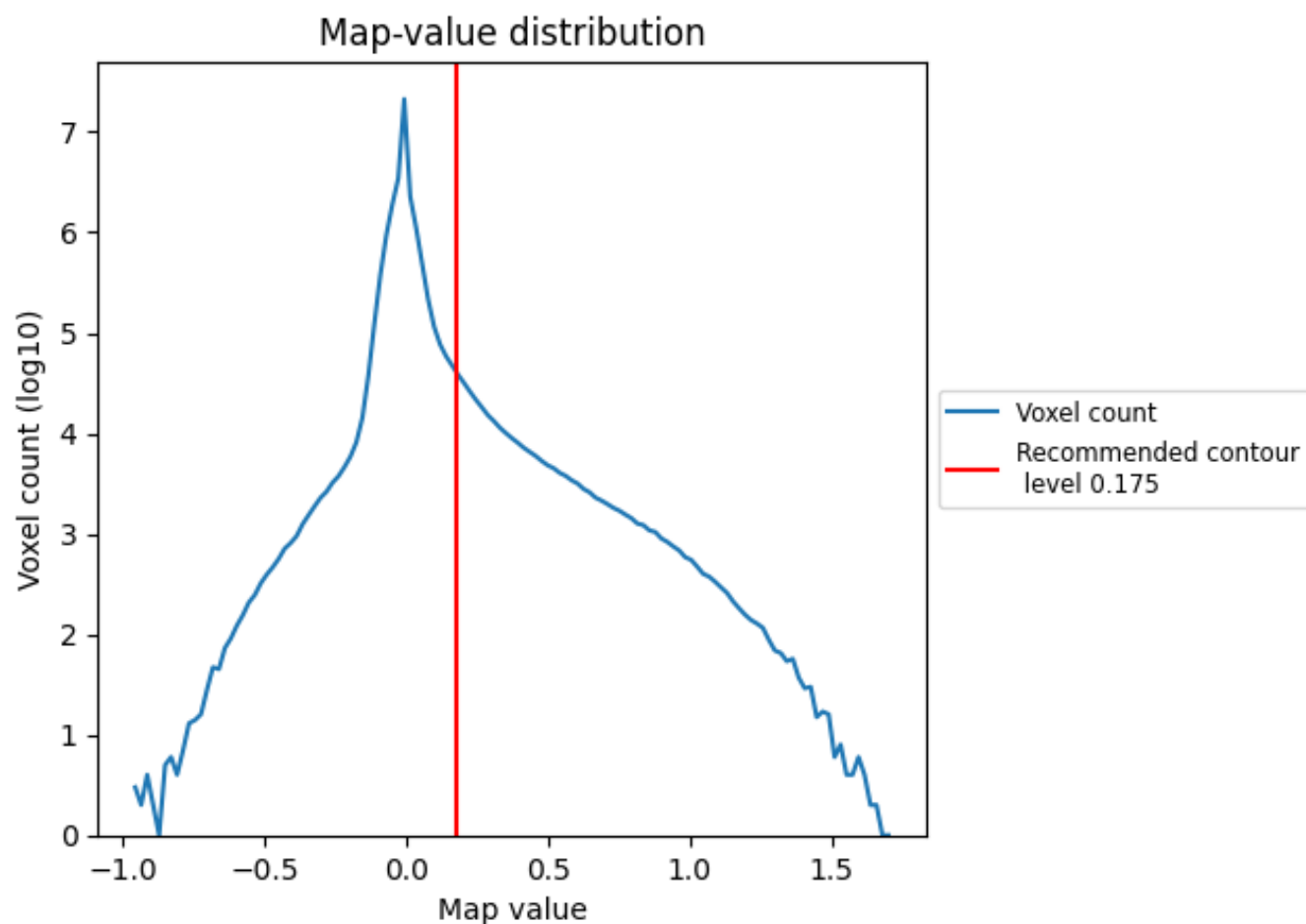
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

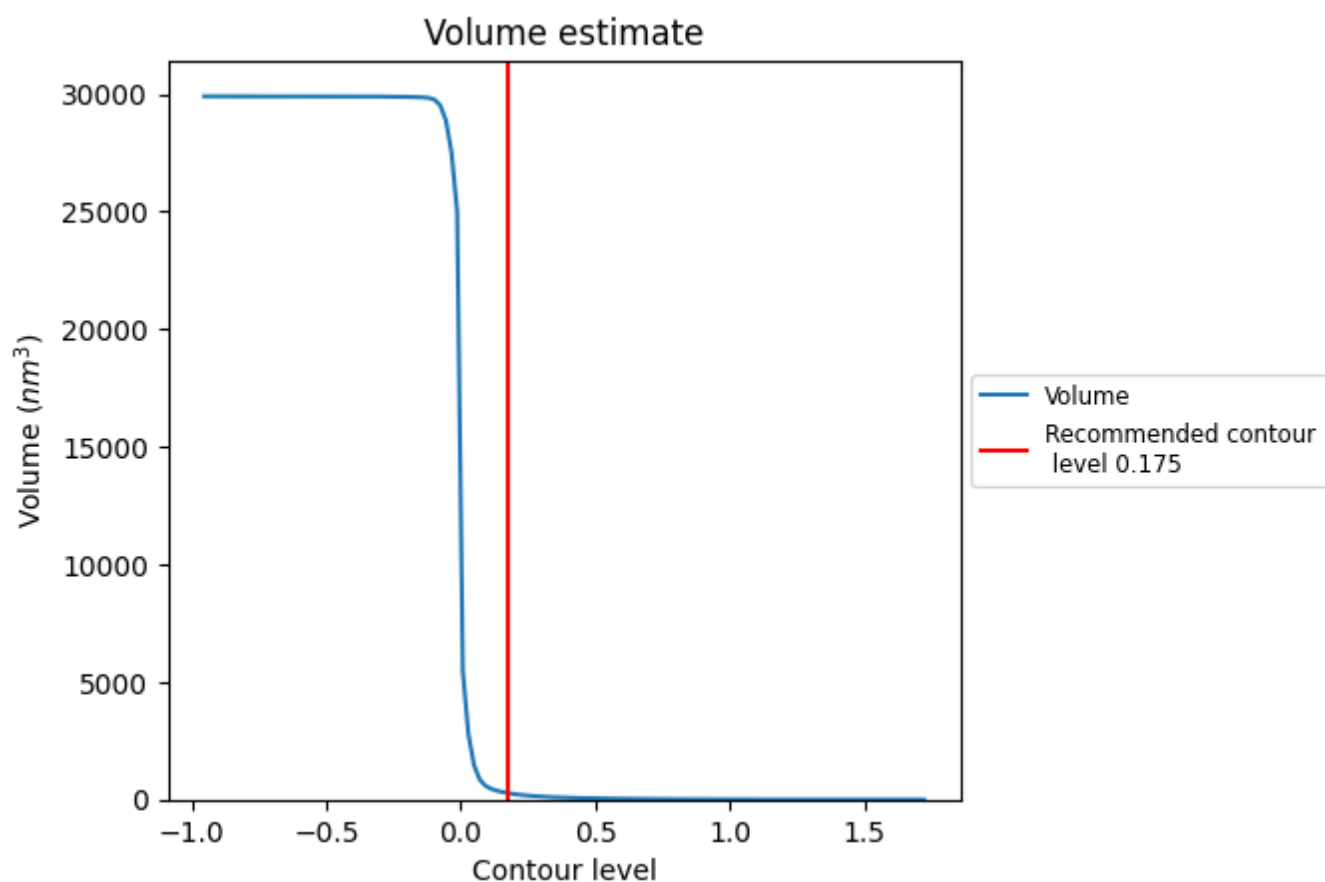
This section contains the results of statistical analysis of the map.

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.

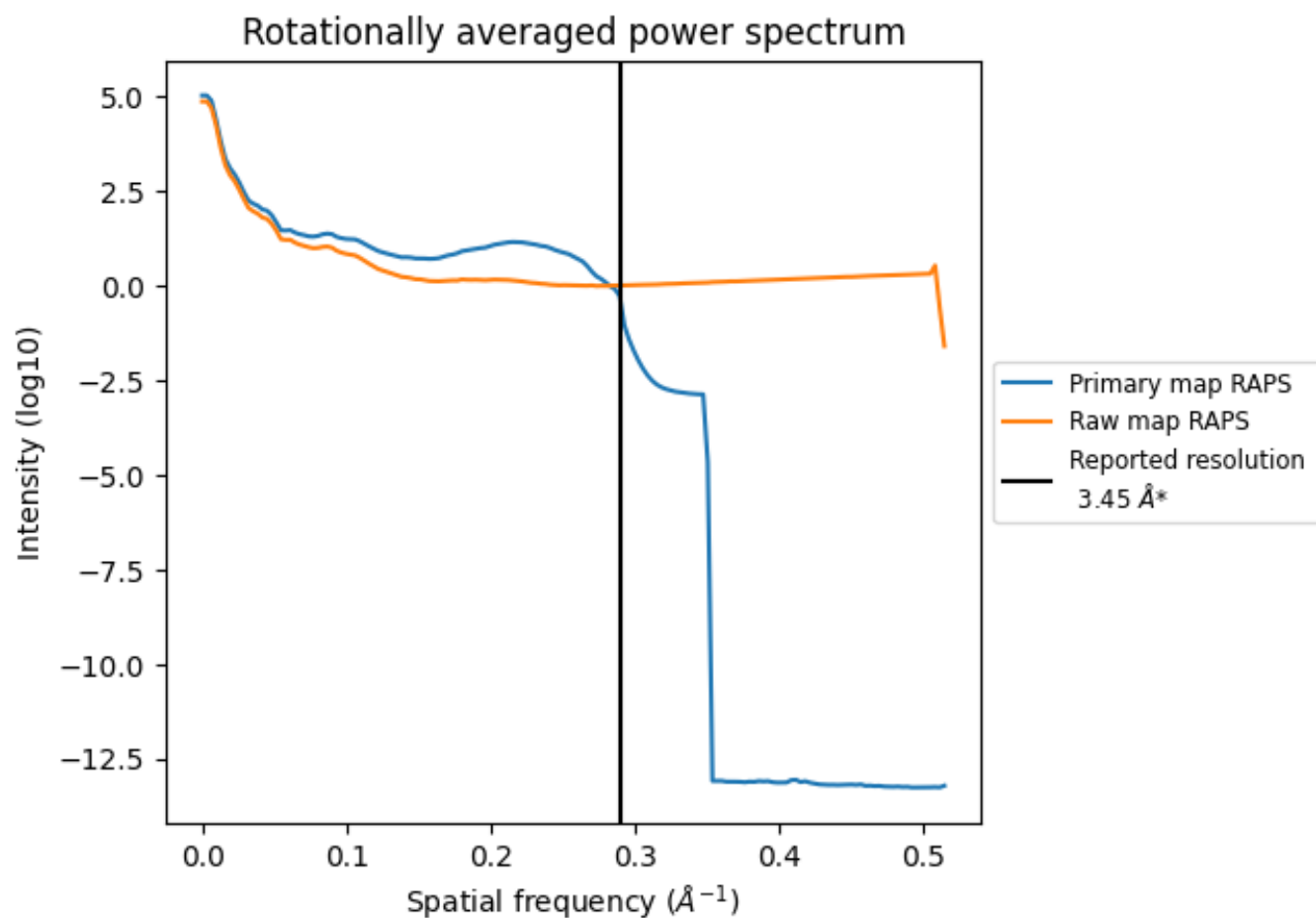
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 275 nm³; this corresponds to an approximate mass of 248 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 ⓘ

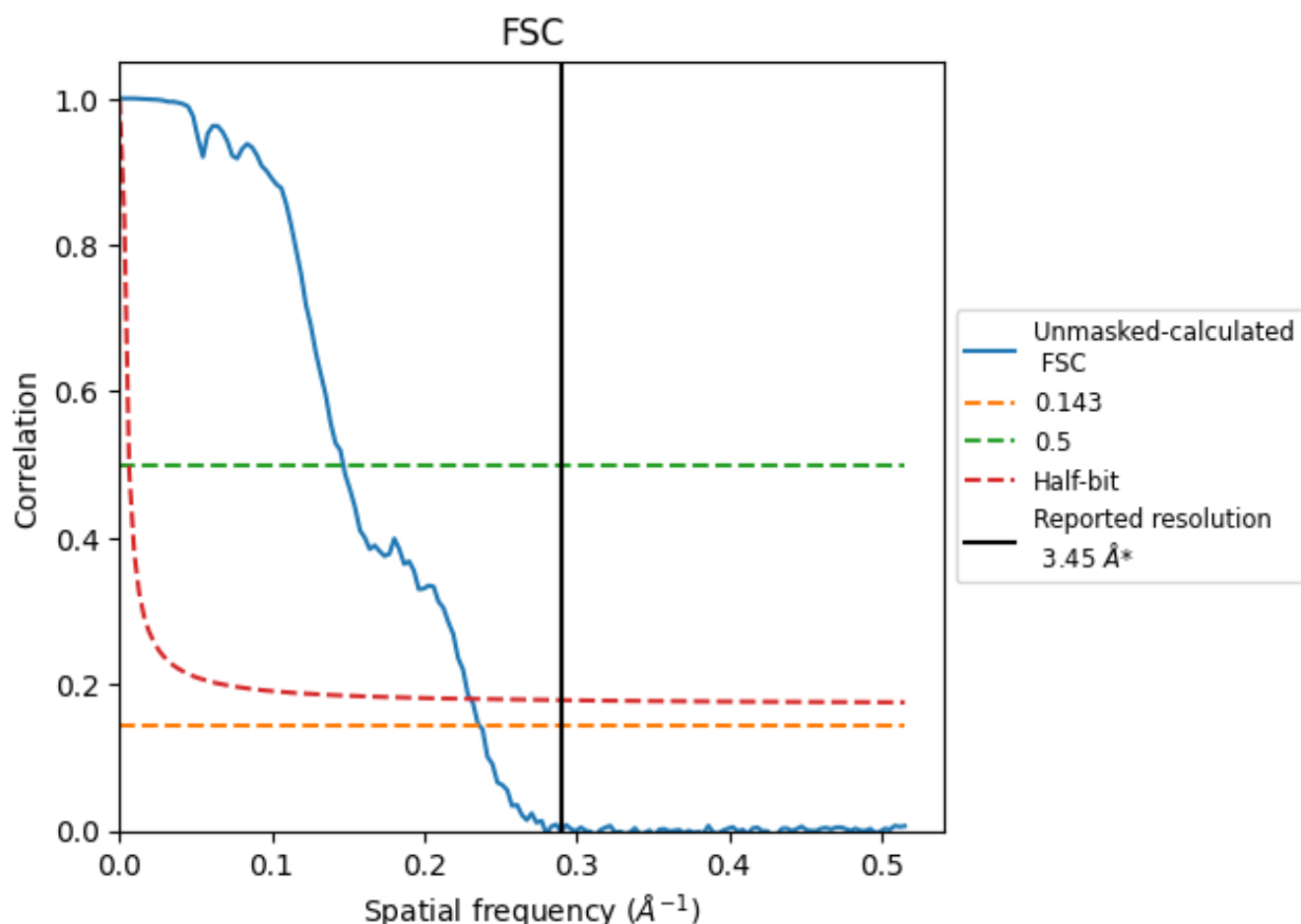


*Reported resolution corresponds to spatial frequency of 0.290 \AA^{-1}

8 Fourier-Shell correlation [i](#)

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

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of 0.290 Å⁻¹

8.2 Resolution estimates [i](#)

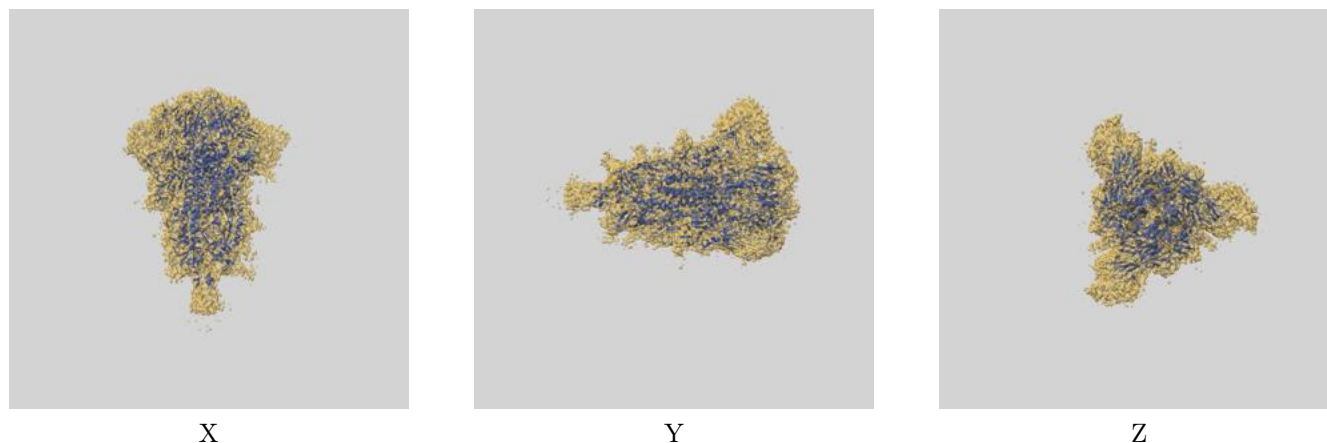
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.45	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	4.23	6.81	4.34

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 4.23 differs from the reported value 3.45 by more than 10 %

9 Map-model fit [i](#)

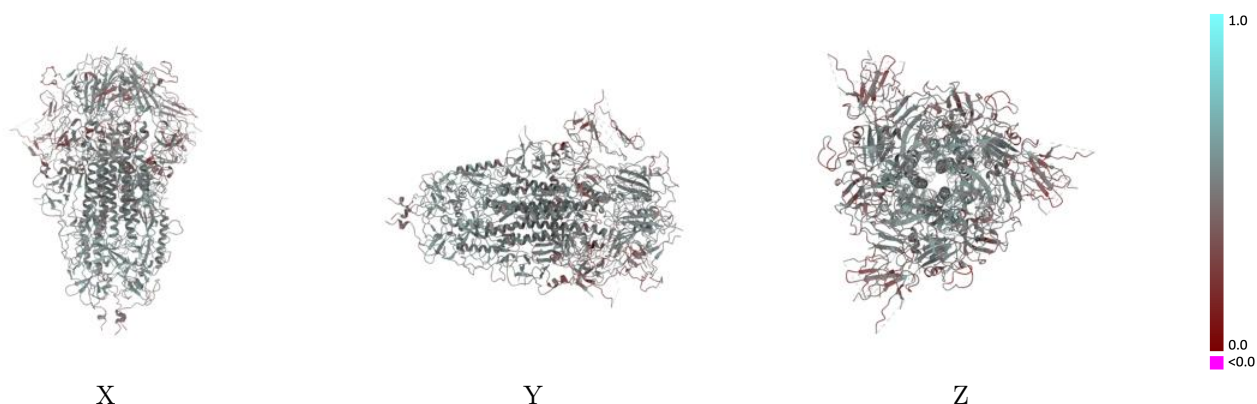
This section contains information regarding the fit between EMDB map EMD-33600 and PDB model 7Y42. Per-residue inclusion information can be found in [section 3](#) on [page 7](#).

9.1 Map-model overlay [i](#)



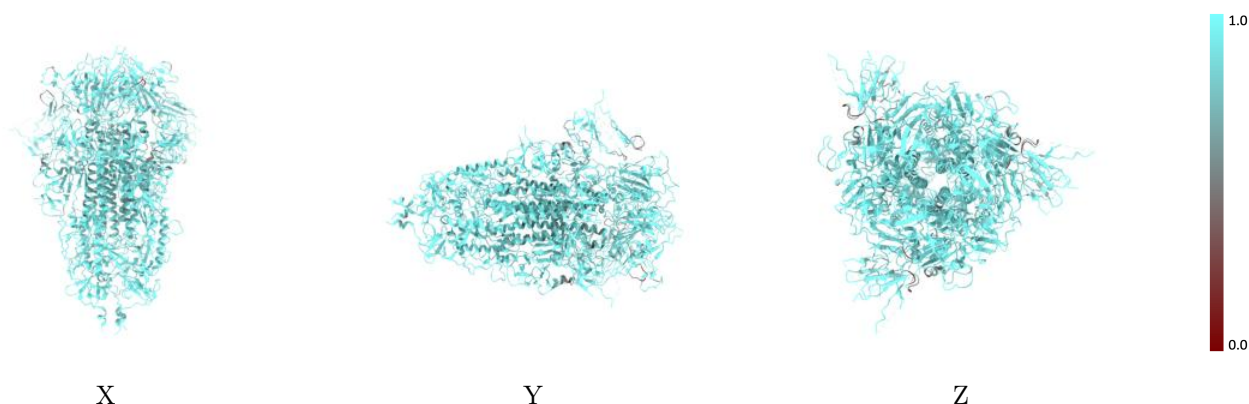
The images above show the 3D surface view of the map at the recommended contour level 0.175 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



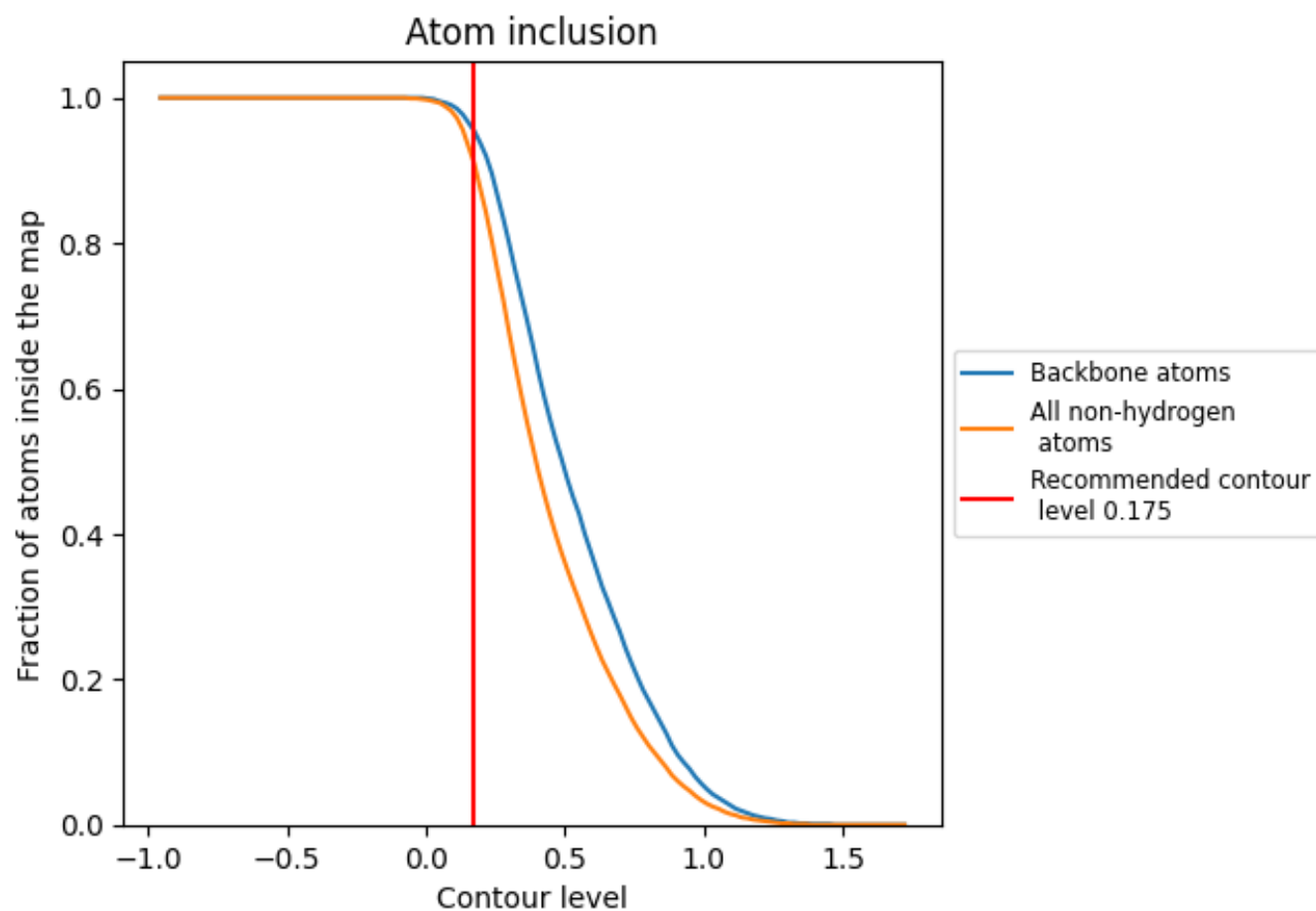
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.175).

9.4 Atom inclusion [i](#)



At the recommended contour level, 95% of all backbone atoms, 91% 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 (0.175) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	<div></div> 0.9090	<div></div> 0.4730
A	<div></div> 0.9100	<div></div> 0.4730
B	<div></div> 0.9090	<div></div> 0.4730
D	<div></div> 0.9080	<div></div> 0.4720

