



Full wwPDB EM Validation Report ⓘ

Jun 25, 2025 – 06:22 AM JST

PDB ID : 7WO5 / pdb_00007wo5
EMDB ID : EMD-32639
Title : SARS-CoV-2 Spike in complex with IgG 553-15 (S-553-15 trimer)
Authors : Zhan, W.Q.; Zhang, X.; Chen, Z.G.; Sun, L.
Deposited on : 2022-01-20
Resolution : 3.45 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:

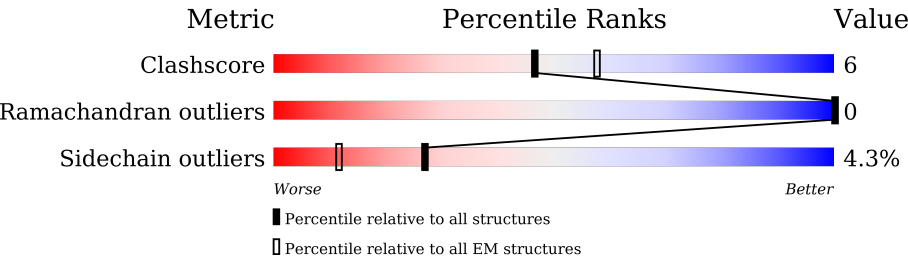
EMDB validation analysis : 0.0.1.dev118
Mogul : 1.8.5 (274361), CSD as541be (2020)
MolProbity : 4-5-2 with Phenix2.0rc1
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.44

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	1288	
1	B	1288	
1	C	1288	
2	D	225	
2	F	225	
2	H	225	
3	E	218	
3	G	218	

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
3	I	218	6% 75% 23% ..

2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 35604 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	1076	Total	C	N	O	S	0	0
			8338	5318	1396	1586	38		
1	B	1076	Total	C	N	O	S	0	0
			8338	5318	1396	1586	38		
1	C	1076	Total	C	N	O	S	0	0
			8338	5318	1396	1586	38		

There are 258 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	614	GLY	ASP	variant	UNP P0DTC2
A	682	GLY	ARG	conflict	UNP P0DTC2
A	683	SER	ARG	conflict	UNP P0DTC2
A	685	SER	ARG	conflict	UNP P0DTC2
A	986	PRO	LYS	conflict	UNP P0DTC2
A	987	PRO	VAL	conflict	UNP P0DTC2
A	1209	GLY	-	expression tag	UNP P0DTC2
A	1210	SER	-	expression tag	UNP P0DTC2
A	1211	GLY	-	expression tag	UNP P0DTC2
A	1212	TYR	-	expression tag	UNP P0DTC2
A	1213	ILE	-	expression tag	UNP P0DTC2
A	1214	PRO	-	expression tag	UNP P0DTC2
A	1215	GLU	-	expression tag	UNP P0DTC2
A	1216	ALA	-	expression tag	UNP P0DTC2
A	1217	PRO	-	expression tag	UNP P0DTC2
A	1218	ARG	-	expression tag	UNP P0DTC2
A	1219	ASP	-	expression tag	UNP P0DTC2
A	1220	GLY	-	expression tag	UNP P0DTC2
A	1221	GLN	-	expression tag	UNP P0DTC2
A	1222	ALA	-	expression tag	UNP P0DTC2
A	1223	TYR	-	expression tag	UNP P0DTC2
A	1224	VAL	-	expression tag	UNP P0DTC2
A	1225	ARG	-	expression tag	UNP P0DTC2
A	1226	LYS	-	expression tag	UNP P0DTC2

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
A	1227	ASP	-	expression tag	UNP P0DTC2
A	1228	GLY	-	expression tag	UNP P0DTC2
A	1229	GLU	-	expression tag	UNP P0DTC2
A	1230	TRP	-	expression tag	UNP P0DTC2
A	1231	VAL	-	expression tag	UNP P0DTC2
A	1232	PHE	-	expression tag	UNP P0DTC2
A	1233	LEU	-	expression tag	UNP P0DTC2
A	1234	SER	-	expression tag	UNP P0DTC2
A	1235	THR	-	expression tag	UNP P0DTC2
A	1236	PHE	-	expression tag	UNP P0DTC2
A	1237	LEU	-	expression tag	UNP P0DTC2
A	1238	SER	-	expression tag	UNP P0DTC2
A	1239	GLY	-	expression tag	UNP P0DTC2
A	1240	LEU	-	expression tag	UNP P0DTC2
A	1241	GLU	-	expression tag	UNP P0DTC2
A	1242	VAL	-	expression tag	UNP P0DTC2
A	1243	LEU	-	expression tag	UNP P0DTC2
A	1244	PHE	-	expression tag	UNP P0DTC2
A	1245	GLN	-	expression tag	UNP P0DTC2
A	1246	GLY	-	expression tag	UNP P0DTC2
A	1247	PRO	-	expression tag	UNP P0DTC2
A	1248	GLY	-	expression tag	UNP P0DTC2
A	1249	GLY	-	expression tag	UNP P0DTC2
A	1250	TRP	-	expression tag	UNP P0DTC2
A	1251	SER	-	expression tag	UNP P0DTC2
A	1252	HIS	-	expression tag	UNP P0DTC2
A	1253	PRO	-	expression tag	UNP P0DTC2
A	1254	GLN	-	expression tag	UNP P0DTC2
A	1255	PHE	-	expression tag	UNP P0DTC2
A	1256	GLU	-	expression tag	UNP P0DTC2
A	1257	LYS	-	expression tag	UNP P0DTC2
A	1258	GLY	-	expression tag	UNP P0DTC2
A	1259	GLY	-	expression tag	UNP P0DTC2
A	1260	GLY	-	expression tag	UNP P0DTC2
A	1261	SER	-	expression tag	UNP P0DTC2
A	1262	GLY	-	expression tag	UNP P0DTC2
A	1263	GLY	-	expression tag	UNP P0DTC2
A	1264	GLY	-	expression tag	UNP P0DTC2
A	1265	SER	-	expression tag	UNP P0DTC2
A	1266	GLY	-	expression tag	UNP P0DTC2
A	1267	GLY	-	expression tag	UNP P0DTC2
A	1268	SER	-	expression tag	UNP P0DTC2

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
A	1269	ALA	-	expression tag	UNP P0DTC2
A	1270	TRP	-	expression tag	UNP P0DTC2
A	1271	SER	-	expression tag	UNP P0DTC2
A	1272	HIS	-	expression tag	UNP P0DTC2
A	1273	PRO	-	expression tag	UNP P0DTC2
A	1274	GLN	-	expression tag	UNP P0DTC2
A	1275	PHE	-	expression tag	UNP P0DTC2
A	1276	GLU	-	expression tag	UNP P0DTC2
A	1277	LYS	-	expression tag	UNP P0DTC2
A	1278	GLY	-	expression tag	UNP P0DTC2
A	1279	GLY	-	expression tag	UNP P0DTC2
A	1280	SER	-	expression tag	UNP P0DTC2
A	1281	HIS	-	expression tag	UNP P0DTC2
A	1282	HIS	-	expression tag	UNP P0DTC2
A	1283	HIS	-	expression tag	UNP P0DTC2
A	1284	HIS	-	expression tag	UNP P0DTC2
A	1285	HIS	-	expression tag	UNP P0DTC2
A	1286	HIS	-	expression tag	UNP P0DTC2
A	1287	HIS	-	expression tag	UNP P0DTC2
A	1288	HIS	-	expression tag	UNP P0DTC2
B	614	GLY	ASP	variant	UNP P0DTC2
B	682	GLY	ARG	conflict	UNP P0DTC2
B	683	SER	ARG	conflict	UNP P0DTC2
B	685	SER	ARG	conflict	UNP P0DTC2
B	986	PRO	LYS	conflict	UNP P0DTC2
B	987	PRO	VAL	conflict	UNP P0DTC2
B	1209	GLY	-	expression tag	UNP P0DTC2
B	1210	SER	-	expression tag	UNP P0DTC2
B	1211	GLY	-	expression tag	UNP P0DTC2
B	1212	TYR	-	expression tag	UNP P0DTC2
B	1213	ILE	-	expression tag	UNP P0DTC2
B	1214	PRO	-	expression tag	UNP P0DTC2
B	1215	GLU	-	expression tag	UNP P0DTC2
B	1216	ALA	-	expression tag	UNP P0DTC2
B	1217	PRO	-	expression tag	UNP P0DTC2
B	1218	ARG	-	expression tag	UNP P0DTC2
B	1219	ASP	-	expression tag	UNP P0DTC2
B	1220	GLY	-	expression tag	UNP P0DTC2
B	1221	GLN	-	expression tag	UNP P0DTC2
B	1222	ALA	-	expression tag	UNP P0DTC2
B	1223	TYR	-	expression tag	UNP P0DTC2
B	1224	VAL	-	expression tag	UNP P0DTC2

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
B	1225	ARG	-	expression tag	UNP P0DTC2
B	1226	LYS	-	expression tag	UNP P0DTC2
B	1227	ASP	-	expression tag	UNP P0DTC2
B	1228	GLY	-	expression tag	UNP P0DTC2
B	1229	GLU	-	expression tag	UNP P0DTC2
B	1230	TRP	-	expression tag	UNP P0DTC2
B	1231	VAL	-	expression tag	UNP P0DTC2
B	1232	PHE	-	expression tag	UNP P0DTC2
B	1233	LEU	-	expression tag	UNP P0DTC2
B	1234	SER	-	expression tag	UNP P0DTC2
B	1235	THR	-	expression tag	UNP P0DTC2
B	1236	PHE	-	expression tag	UNP P0DTC2
B	1237	LEU	-	expression tag	UNP P0DTC2
B	1238	SER	-	expression tag	UNP P0DTC2
B	1239	GLY	-	expression tag	UNP P0DTC2
B	1240	LEU	-	expression tag	UNP P0DTC2
B	1241	GLU	-	expression tag	UNP P0DTC2
B	1242	VAL	-	expression tag	UNP P0DTC2
B	1243	LEU	-	expression tag	UNP P0DTC2
B	1244	PHE	-	expression tag	UNP P0DTC2
B	1245	GLN	-	expression tag	UNP P0DTC2
B	1246	GLY	-	expression tag	UNP P0DTC2
B	1247	PRO	-	expression tag	UNP P0DTC2
B	1248	GLY	-	expression tag	UNP P0DTC2
B	1249	GLY	-	expression tag	UNP P0DTC2
B	1250	TRP	-	expression tag	UNP P0DTC2
B	1251	SER	-	expression tag	UNP P0DTC2
B	1252	HIS	-	expression tag	UNP P0DTC2
B	1253	PRO	-	expression tag	UNP P0DTC2
B	1254	GLN	-	expression tag	UNP P0DTC2
B	1255	PHE	-	expression tag	UNP P0DTC2
B	1256	GLU	-	expression tag	UNP P0DTC2
B	1257	LYS	-	expression tag	UNP P0DTC2
B	1258	GLY	-	expression tag	UNP P0DTC2
B	1259	GLY	-	expression tag	UNP P0DTC2
B	1260	GLY	-	expression tag	UNP P0DTC2
B	1261	SER	-	expression tag	UNP P0DTC2
B	1262	GLY	-	expression tag	UNP P0DTC2
B	1263	GLY	-	expression tag	UNP P0DTC2
B	1264	GLY	-	expression tag	UNP P0DTC2
B	1265	SER	-	expression tag	UNP P0DTC2
B	1266	GLY	-	expression tag	UNP P0DTC2

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
B	1267	GLY	-	expression tag	UNP P0DTC2
B	1268	SER	-	expression tag	UNP P0DTC2
B	1269	ALA	-	expression tag	UNP P0DTC2
B	1270	TRP	-	expression tag	UNP P0DTC2
B	1271	SER	-	expression tag	UNP P0DTC2
B	1272	HIS	-	expression tag	UNP P0DTC2
B	1273	PRO	-	expression tag	UNP P0DTC2
B	1274	GLN	-	expression tag	UNP P0DTC2
B	1275	PHE	-	expression tag	UNP P0DTC2
B	1276	GLU	-	expression tag	UNP P0DTC2
B	1277	LYS	-	expression tag	UNP P0DTC2
B	1278	GLY	-	expression tag	UNP P0DTC2
B	1279	GLY	-	expression tag	UNP P0DTC2
B	1280	SER	-	expression tag	UNP P0DTC2
B	1281	HIS	-	expression tag	UNP P0DTC2
B	1282	HIS	-	expression tag	UNP P0DTC2
B	1283	HIS	-	expression tag	UNP P0DTC2
B	1284	HIS	-	expression tag	UNP P0DTC2
B	1285	HIS	-	expression tag	UNP P0DTC2
B	1286	HIS	-	expression tag	UNP P0DTC2
B	1287	HIS	-	expression tag	UNP P0DTC2
B	1288	HIS	-	expression tag	UNP P0DTC2
C	614	GLY	ASP	variant	UNP P0DTC2
C	682	GLY	ARG	conflict	UNP P0DTC2
C	683	SER	ARG	conflict	UNP P0DTC2
C	685	SER	ARG	conflict	UNP P0DTC2
C	986	PRO	LYS	conflict	UNP P0DTC2
C	987	PRO	VAL	conflict	UNP P0DTC2
C	1209	GLY	-	expression tag	UNP P0DTC2
C	1210	SER	-	expression tag	UNP P0DTC2
C	1211	GLY	-	expression tag	UNP P0DTC2
C	1212	TYR	-	expression tag	UNP P0DTC2
C	1213	ILE	-	expression tag	UNP P0DTC2
C	1214	PRO	-	expression tag	UNP P0DTC2
C	1215	GLU	-	expression tag	UNP P0DTC2
C	1216	ALA	-	expression tag	UNP P0DTC2
C	1217	PRO	-	expression tag	UNP P0DTC2
C	1218	ARG	-	expression tag	UNP P0DTC2
C	1219	ASP	-	expression tag	UNP P0DTC2
C	1220	GLY	-	expression tag	UNP P0DTC2
C	1221	GLN	-	expression tag	UNP P0DTC2
C	1222	ALA	-	expression tag	UNP P0DTC2

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
C	1223	TYR	-	expression tag	UNP P0DTC2
C	1224	VAL	-	expression tag	UNP P0DTC2
C	1225	ARG	-	expression tag	UNP P0DTC2
C	1226	LYS	-	expression tag	UNP P0DTC2
C	1227	ASP	-	expression tag	UNP P0DTC2
C	1228	GLY	-	expression tag	UNP P0DTC2
C	1229	GLU	-	expression tag	UNP P0DTC2
C	1230	TRP	-	expression tag	UNP P0DTC2
C	1231	VAL	-	expression tag	UNP P0DTC2
C	1232	PHE	-	expression tag	UNP P0DTC2
C	1233	LEU	-	expression tag	UNP P0DTC2
C	1234	SER	-	expression tag	UNP P0DTC2
C	1235	THR	-	expression tag	UNP P0DTC2
C	1236	PHE	-	expression tag	UNP P0DTC2
C	1237	LEU	-	expression tag	UNP P0DTC2
C	1238	SER	-	expression tag	UNP P0DTC2
C	1239	GLY	-	expression tag	UNP P0DTC2
C	1240	LEU	-	expression tag	UNP P0DTC2
C	1241	GLU	-	expression tag	UNP P0DTC2
C	1242	VAL	-	expression tag	UNP P0DTC2
C	1243	LEU	-	expression tag	UNP P0DTC2
C	1244	PHE	-	expression tag	UNP P0DTC2
C	1245	GLN	-	expression tag	UNP P0DTC2
C	1246	GLY	-	expression tag	UNP P0DTC2
C	1247	PRO	-	expression tag	UNP P0DTC2
C	1248	GLY	-	expression tag	UNP P0DTC2
C	1249	GLY	-	expression tag	UNP P0DTC2
C	1250	TRP	-	expression tag	UNP P0DTC2
C	1251	SER	-	expression tag	UNP P0DTC2
C	1252	HIS	-	expression tag	UNP P0DTC2
C	1253	PRO	-	expression tag	UNP P0DTC2
C	1254	GLN	-	expression tag	UNP P0DTC2
C	1255	PHE	-	expression tag	UNP P0DTC2
C	1256	GLU	-	expression tag	UNP P0DTC2
C	1257	LYS	-	expression tag	UNP P0DTC2
C	1258	GLY	-	expression tag	UNP P0DTC2
C	1259	GLY	-	expression tag	UNP P0DTC2
C	1260	GLY	-	expression tag	UNP P0DTC2
C	1261	SER	-	expression tag	UNP P0DTC2
C	1262	GLY	-	expression tag	UNP P0DTC2
C	1263	GLY	-	expression tag	UNP P0DTC2
C	1264	GLY	-	expression tag	UNP P0DTC2

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
C	1265	SER	-	expression tag	UNP P0DTC2
C	1266	GLY	-	expression tag	UNP P0DTC2
C	1267	GLY	-	expression tag	UNP P0DTC2
C	1268	SER	-	expression tag	UNP P0DTC2
C	1269	ALA	-	expression tag	UNP P0DTC2
C	1270	TRP	-	expression tag	UNP P0DTC2
C	1271	SER	-	expression tag	UNP P0DTC2
C	1272	HIS	-	expression tag	UNP P0DTC2
C	1273	PRO	-	expression tag	UNP P0DTC2
C	1274	GLN	-	expression tag	UNP P0DTC2
C	1275	PHE	-	expression tag	UNP P0DTC2
C	1276	GLU	-	expression tag	UNP P0DTC2
C	1277	LYS	-	expression tag	UNP P0DTC2
C	1278	GLY	-	expression tag	UNP P0DTC2
C	1279	GLY	-	expression tag	UNP P0DTC2
C	1280	SER	-	expression tag	UNP P0DTC2
C	1281	HIS	-	expression tag	UNP P0DTC2
C	1282	HIS	-	expression tag	UNP P0DTC2
C	1283	HIS	-	expression tag	UNP P0DTC2
C	1284	HIS	-	expression tag	UNP P0DTC2
C	1285	HIS	-	expression tag	UNP P0DTC2
C	1286	HIS	-	expression tag	UNP P0DTC2
C	1287	HIS	-	expression tag	UNP P0DTC2
C	1288	HIS	-	expression tag	UNP P0DTC2

- Molecule 2 is a protein called mAb15 VH.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	D	225	Total	C	N	O	S	0	0
			1704	1077	289	331	7		
2	F	225	Total	C	N	O	S	0	0
			1704	1077	289	331	7		
2	H	225	Total	C	N	O	S	0	0
			1704	1077	289	331	7		

- Molecule 3 is a protein called mAb15 VL.

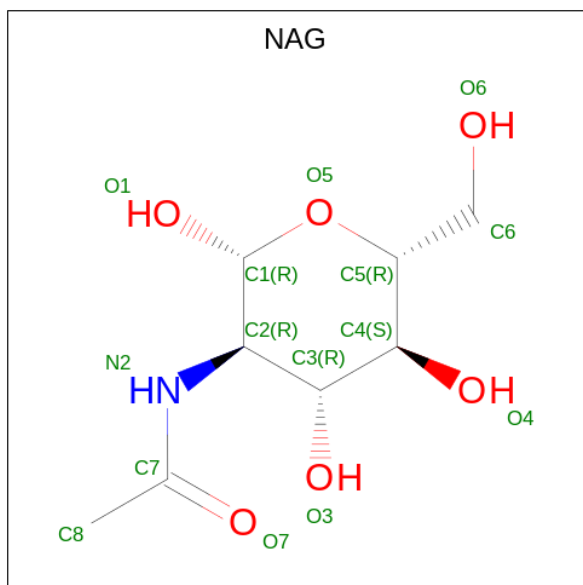
Mol	Chain	Residues	Atoms					AltConf	Trace
3	E	215	Total	C	N	O	S	0	0
			1616	999	270	342	5		
3	G	215	Total	C	N	O	S	0	0
			1616	999	270	342	5		

Continued on next page...

Continued from previous page...

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	I	215	1616	999	270	342	5	0	0

- Molecule 4 is 2-acetamido-2-deoxy-beta-D-glucopyranose (CCD ID: NAG) (formula: $C_8H_{15}NO_6$).



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

Continued on next page...

Continued from previous page...

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

Continued on next page...

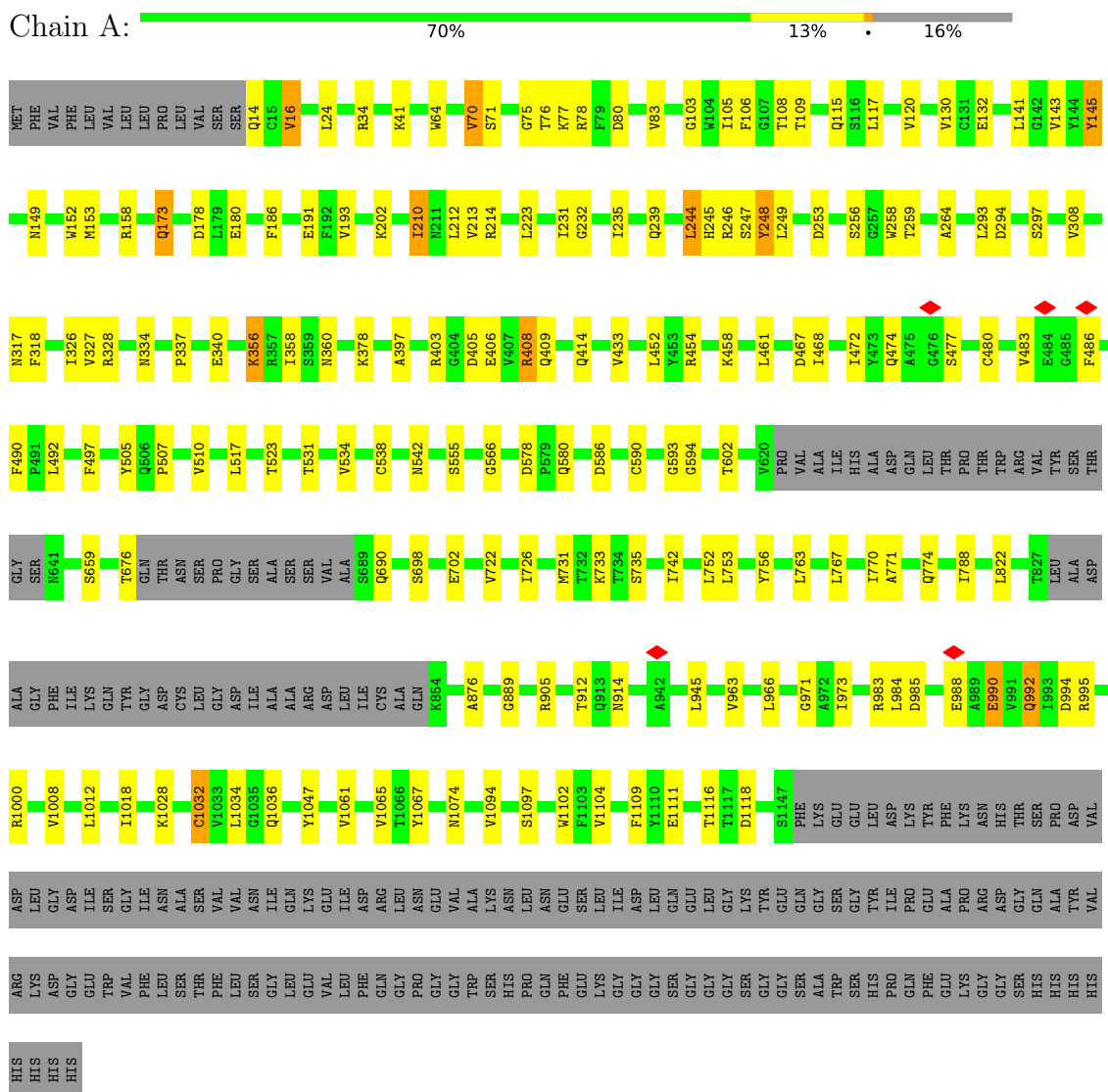
Continued from previous page...

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

3 Residue-property plots

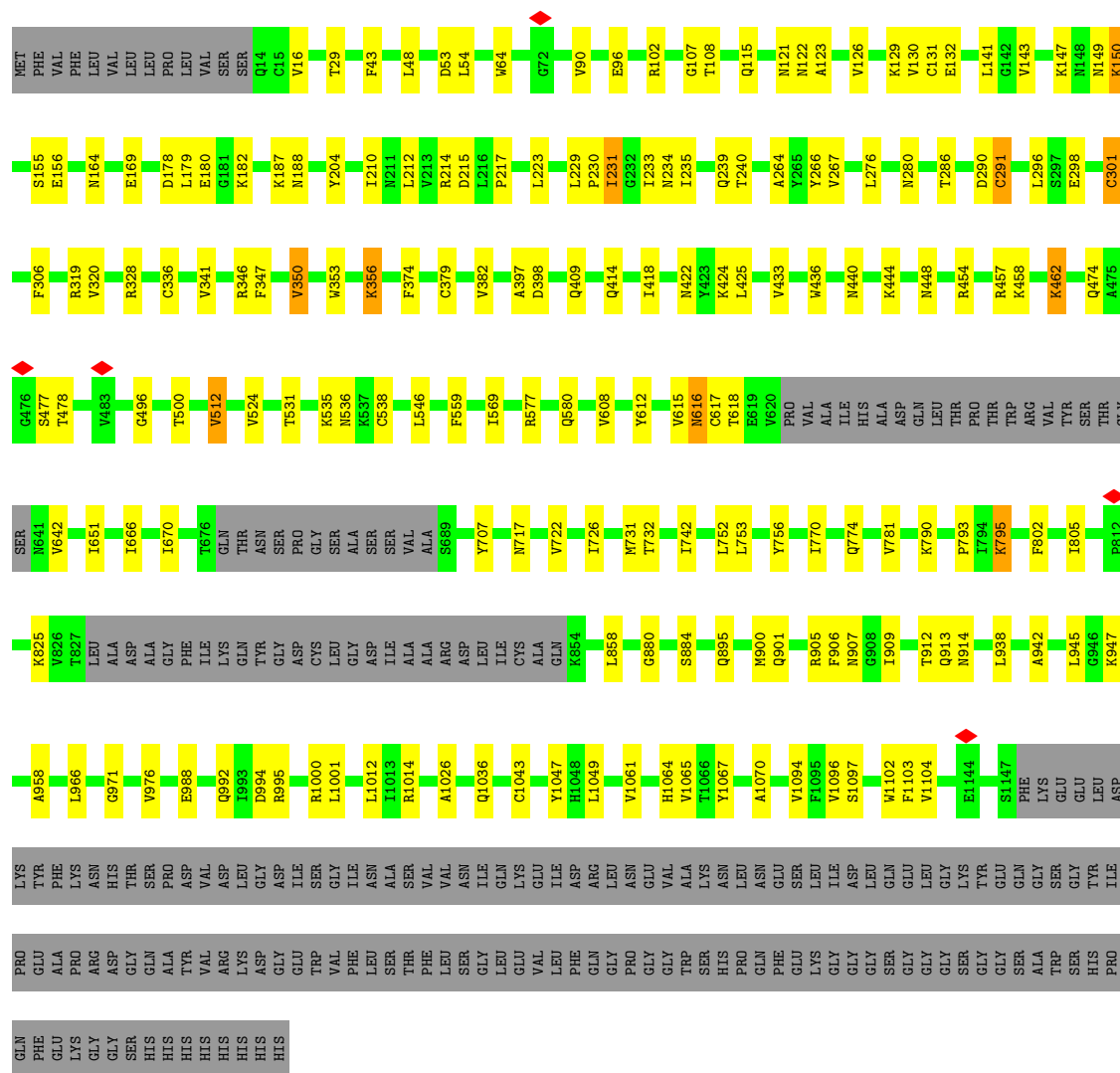
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion 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



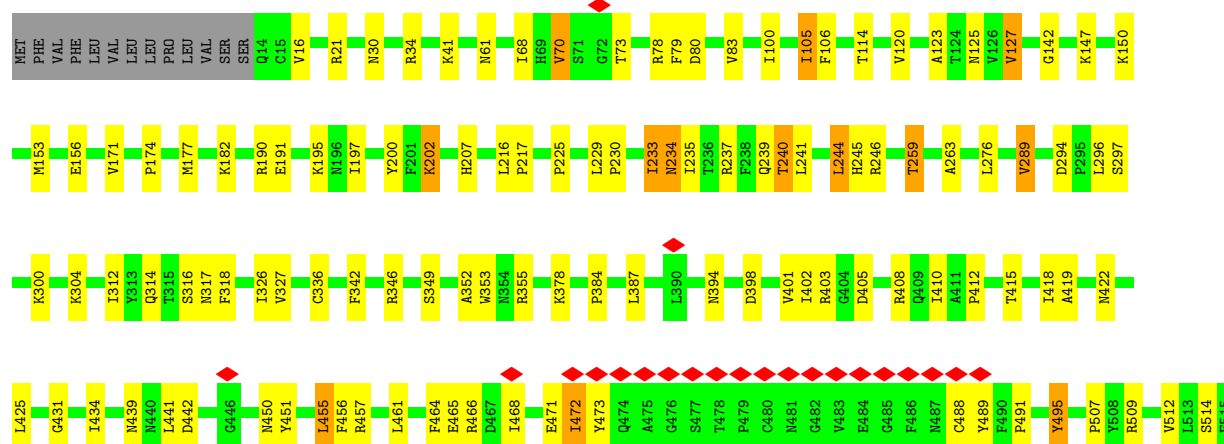
• Molecule 1: Spike glycoprotein

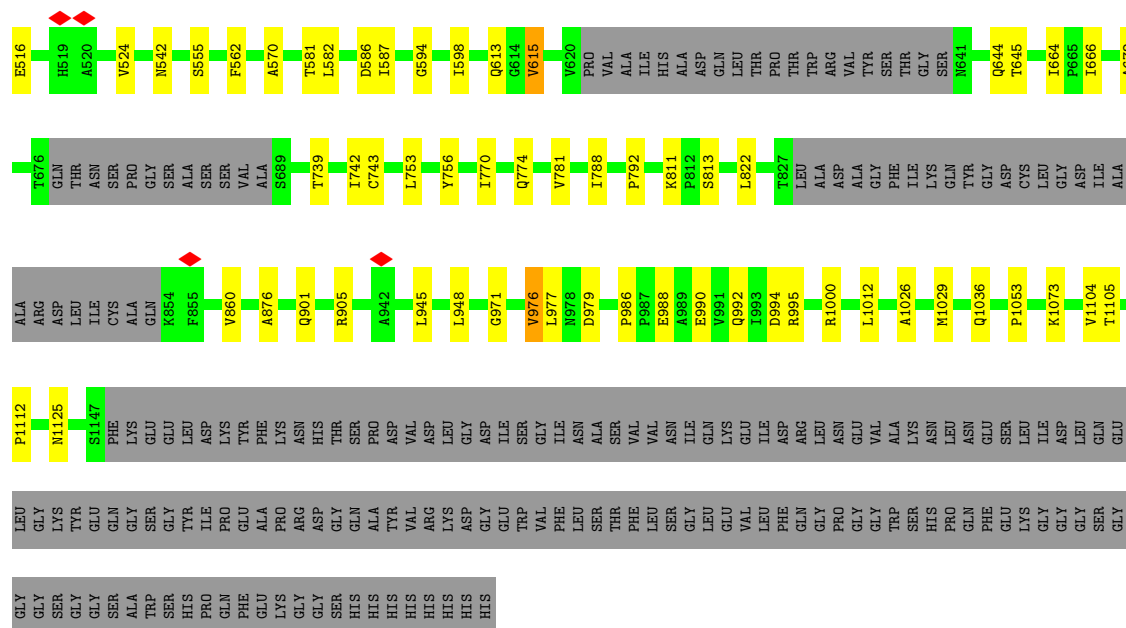




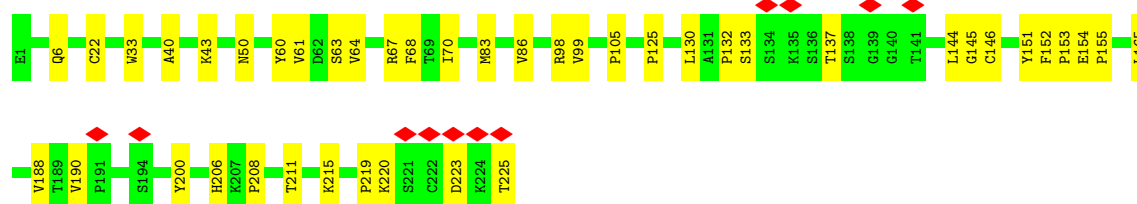
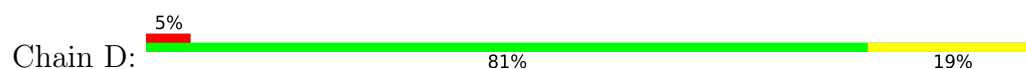
• Molecule 1: Spike glycoprotein

Chain C: 70% 13% 16%

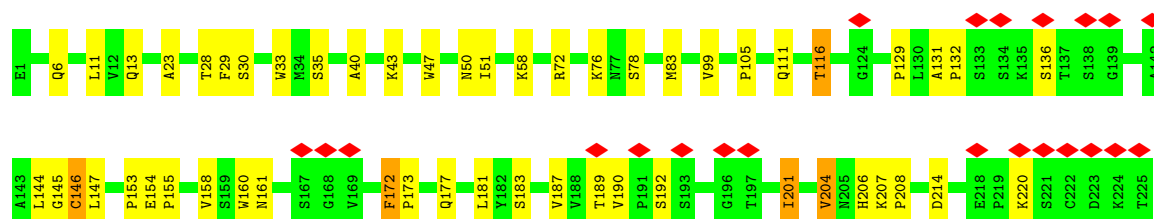
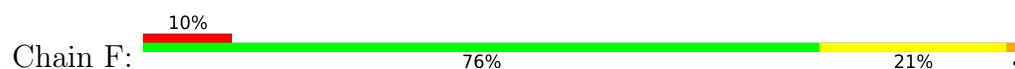




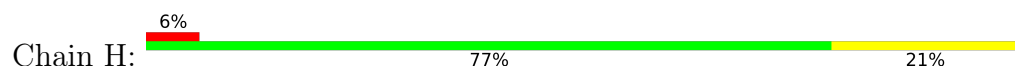
- Molecule 2: mAb15 VH



- Molecule 2: mAb15 VH

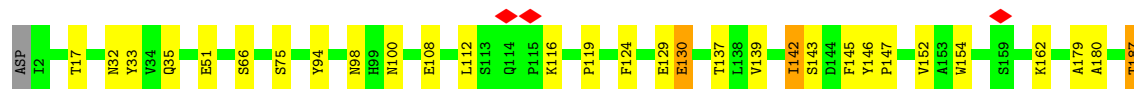
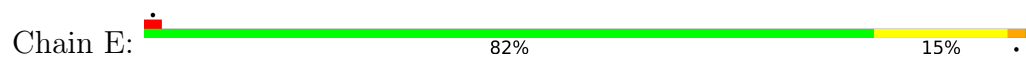


- Molecule 2: mAb15 VH

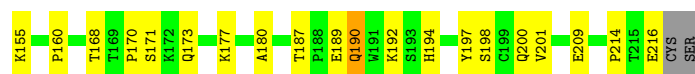
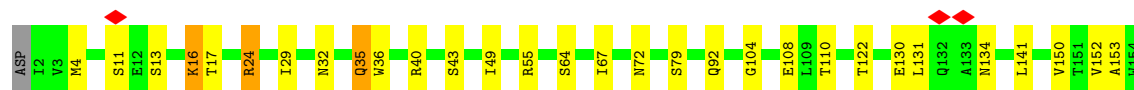
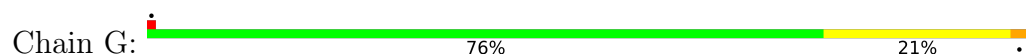




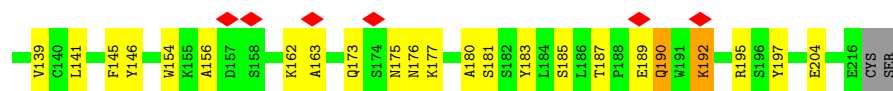
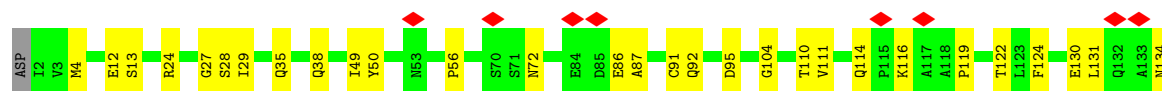
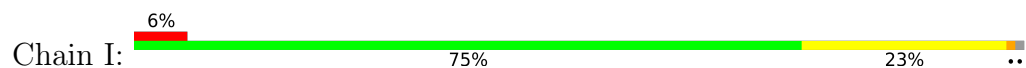
• Molecule 3: mAb15 VL



• Molecule 3: mAb15 VL



• Molecule 3: mAb15 VL



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	377884	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 ($e^-/\text{\AA}^2$)	61	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	0.103	Depositor
Minimum map value	0.000	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.001	Depositor
Recommended contour level	0.01	Depositor
Map size (Å)	513.60004, 513.60004, 513.60004	wwPDB
Map dimensions	480, 480, 480	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.07, 1.07, 1.07	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: 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	0.13	0/8534	0.36	0/11626
1	B	0.13	0/8534	0.35	0/11626
1	C	0.14	0/8534	0.36	1/11626 (0.0%)
2	D	0.12	0/1748	0.36	0/2379
2	F	0.11	0/1748	0.31	0/2379
2	H	0.09	0/1748	0.26	0/2379
3	E	0.09	0/1654	0.29	0/2260
3	G	0.09	0/1654	0.27	0/2260
3	I	0.08	0/1654	0.24	0/2260
All	All	0.13	0/35808	0.34	1/48795 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	613	GLN	N-CA-C	6.06	118.50	109.59

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	8338	0	8069	91	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	B	8338	0	8065	91	0
1	C	8338	0	8065	90	0
2	D	1704	0	1657	23	0
2	F	1704	0	1657	28	0
2	H	1704	0	1657	29	0
3	E	1616	0	1538	20	0
3	G	1616	0	1538	24	0
3	I	1616	0	1538	30	0
4	A	210	0	195	2	0
4	B	210	0	195	2	0
4	C	210	0	195	5	0
All	All	35604	0	34369	409	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 6.

All (409) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:11:LEU:HD13	2:F:116:THR:HG23	1.68	0.74
2:H:52:ASN:HD22	2:H:53:GLN:H	1.37	0.71
2:D:206:HIS:HB3	2:D:211:THR:HB	1.73	0.70
2:H:50:ASN:HD22	2:H:51:ILE:H	1.39	0.70
2:D:132:PRO:HD2	2:D:219:PRO:HB3	1.74	0.69
2:D:165:LEU:HD21	2:D:188:VAL:HG21	1.75	0.68
1:A:328:ARG:HH21	1:A:580:GLN:HB2	1.60	0.67
1:A:742:ILE:O	1:A:1000:ARG:NH1	2.29	0.66
1:A:988:GLU:O	1:A:992:GLN:NE2	2.28	0.66
3:E:119:PRO:HB3	3:E:145:PHE:HB3	1.77	0.66
2:H:52:ASN:HB2	2:H:57:GLU:H	1.60	0.66
2:F:177:GLN:HB2	2:F:181:LEU:HB2	1.78	0.66
2:H:105:PRO:HB3	3:I:35:GLN:HG2	1.77	0.65
2:D:61:VAL:HG12	2:D:64:VAL:HG22	1.77	0.65
1:A:71:SER:HA	1:A:75:GLY:HA2	1.80	0.64
2:F:201:ILE:HB	2:F:214:ASP:HB3	1.78	0.64
1:B:742:ILE:O	1:B:1000:ARG:NH1	2.31	0.64
1:C:742:ILE:O	1:C:1000:ARG:NH1	2.32	0.63
3:G:187:THR:HB	3:G:190:GLN:HB2	1.81	0.63
3:E:98:ASN:OD1	3:E:100:ASN:ND2	2.32	0.63
2:D:125:PRO:HB3	2:D:151:TYR:HB3	1.81	0.62
3:G:13:SER:O	3:G:16:LYS:NZ	2.32	0.62

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:403:ARG:HE	1:C:405:ASP:HB2	1.64	0.62
1:A:408:ARG:O	1:A:414:GLN:NE2	2.33	0.62
3:I:86:GLU:HG3	3:I:110:THR:HA	1.81	0.62
1:C:153:MET:HE1	4:C:1312:NAG:HN2	1.64	0.62
1:A:971:GLY:HA3	1:A:995:ARG:HH21	1.63	0.62
1:A:115:GLN:HA	1:A:132:GLU:HG2	1.82	0.61
1:A:145:TYR:HB2	1:A:248:TYR:HB2	1.83	0.61
3:G:153:ALA:HB3	3:G:200:GLN:HB2	1.81	0.61
1:A:555:SER:HB3	1:A:586:ASP:HB2	1.83	0.61
1:B:793:PRO:O	1:B:795:LYS:NZ	2.34	0.61
1:A:327:VAL:HG22	1:A:542:ASN:HB3	1.82	0.61
2:F:33:TRP:HB2	2:F:99:VAL:HB	1.83	0.61
1:B:409:GLN:HA	1:B:414:GLN:HG2	1.83	0.60
1:B:409:GLN:HE22	1:B:418:ILE:H	1.49	0.60
1:B:121:ASN:HB2	1:B:126:VAL:HG22	1.84	0.60
1:A:193:VAL:HG23	1:A:223:LEU:HD22	1.84	0.60
1:A:253:ASP:H	1:A:256:SER:HB3	1.66	0.59
2:H:190:VAL:HG22	2:H:192:SER:H	1.67	0.59
2:D:152:PHE:HB3	2:D:153:PRO:HD3	1.84	0.59
2:H:177:GLN:HB2	2:H:181:LEU:HB2	1.85	0.59
1:B:280:ASN:ND2	1:B:286:THR:OG1	2.36	0.59
1:A:1028:LYS:O	1:A:1032:CYS:HB2	2.03	0.59
1:B:474:GLN:NE2	1:B:477:SER:OG	2.35	0.59
1:A:244:LEU:HD22	1:A:246:ARG:HB2	1.85	0.59
1:C:555:SER:HB3	1:C:586:ASP:HB2	1.84	0.59
1:A:145:TYR:HA	1:A:247:SER:HA	1.85	0.58
2:F:153:PRO:HB2	2:F:155:PRO:HD3	1.84	0.58
1:C:123:ALA:HA	1:C:177:MET:HE1	1.84	0.58
1:C:971:GLY:HA3	1:C:995:ARG:HH21	1.68	0.58
2:F:28:THR:HG22	2:F:30:SER:H	1.67	0.58
1:C:318:PHE:CZ	1:C:615:VAL:HG11	2.38	0.58
1:C:455:LEU:HD13	1:C:456:PHE:H	1.68	0.58
1:A:64:TRP:HE1	1:A:264:ALA:HB1	1.68	0.58
1:C:811:LYS:NZ	1:C:813:SER:OG	2.36	0.58
3:E:154:TRP:O	3:E:162:LYS:NZ	2.36	0.57
1:C:431:GLY:HA3	1:C:514:SER:HA	1.85	0.57
1:C:1105:THR:HG22	1:C:1112:PRO:HA	1.85	0.57
2:F:29:PHE:O	2:F:72:ARG:NH2	2.37	0.57
3:G:35:GLN:NE2	3:G:92:GLN:OE1	2.36	0.57
1:B:346:ARG:NH2	1:B:347:PHE:O	2.37	0.57
1:B:825:LYS:NZ	1:B:938:LEU:O	2.37	0.57

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:401:VAL:HG22	1:C:509:ARG:HG2	1.86	0.57
3:E:124:PHE:HB2	3:E:139:VAL:HB	1.86	0.57
2:F:145:GLY:HA2	2:F:160:TRP:HZ2	1.70	0.57
3:I:35:GLN:NE2	3:I:92:GLN:OE1	2.34	0.57
2:D:133:SER:OG	2:D:223:ASP:OD2	2.21	0.57
1:C:142:GLY:HA3	1:C:156:GLU:HB2	1.85	0.57
1:A:106:PHE:HB3	1:A:235:ILE:HD13	1.86	0.56
2:F:40:ALA:HB3	2:F:43:LYS:HB2	1.87	0.56
2:F:190:VAL:HG22	2:F:192:SER:H	1.70	0.56
1:B:150:LYS:NZ	1:B:180:GLU:OE2	2.37	0.56
1:C:473:TYR:HB3	1:C:489:TYR:HB2	1.87	0.56
2:D:153:PRO:HB2	2:D:155:PRO:HD3	1.88	0.56
3:G:170:PRO:HB3	3:G:180:ALA:HB2	1.86	0.56
3:I:187:THR:HB	3:I:190:GLN:HB2	1.88	0.56
4:C:1315:NAG:H3	4:C:1315:NAG:H83	1.88	0.56
2:H:157:THR:O	2:H:205:ASN:ND2	2.38	0.56
1:B:474:GLN:NE2	1:B:478:THR:O	2.39	0.56
1:A:210:ILE:HG23	1:A:212:LEU:H	1.70	0.56
1:A:676:THR:OG1	1:A:690:GLN:NE2	2.39	0.56
1:C:945:LEU:HD23	1:C:948:LEU:HD12	1.87	0.55
2:H:19:ARG:HD3	2:H:80:PHE:HB3	1.88	0.55
1:C:244:LEU:HD13	1:C:246:ARG:HG3	1.88	0.55
1:B:291:CYS:SG	1:B:298:GLU:HA	2.47	0.55
1:C:442:ASP:OD2	1:C:509:ARG:NH2	2.40	0.55
1:B:102:ARG:HG3	1:B:141:LEU:HD12	1.89	0.55
1:A:24:LEU:O	1:A:78:ARG:NH2	2.39	0.55
3:E:119:PRO:HG2	3:E:206:SER:HB3	1.89	0.55
1:A:474:GLN:NE2	1:A:477:SER:OG	2.40	0.54
3:I:187:THR:HB	3:I:190:GLN:HE21	1.71	0.54
1:C:394:ASN:HB2	1:C:516:GLU:HB3	1.89	0.54
3:I:154:TRP:O	3:I:162:LYS:NZ	2.40	0.54
1:A:356:LYS:HB2	1:A:397:ALA:HB3	1.88	0.54
1:A:105:ILE:HD11	1:A:239:GLN:HB3	1.90	0.54
1:C:349:SER:HB3	1:C:352:ALA:HB3	1.90	0.54
1:A:308:VAL:HG22	1:A:602:THR:HG23	1.90	0.54
1:A:566:GLY:HA2	1:B:43:PHE:H	1.73	0.54
3:I:50:TYR:HE1	3:I:56:PRO:HB3	1.73	0.54
3:I:116:LYS:NZ	3:I:204:GLU:O	2.40	0.53
1:A:406:GLU:OE1	1:A:409:GLN:NE2	2.41	0.53
1:B:214:ARG:NH1	1:B:215:ASP:OD2	2.42	0.53
1:A:752:LEU:HD11	1:A:990:GLU:HG3	1.89	0.53

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:963:VAL:HG11	1:C:570:ALA:HB1	1.90	0.53
1:C:346:ARG:HH22	1:C:450:ASN:HD22	1.55	0.53
1:C:78:ARG:NH1	1:C:80:ASP:OD1	2.42	0.53
1:B:907:ASN:HD22	1:B:913:GLN:HE21	1.55	0.53
3:I:163:ALA:O	3:I:185:SER:OG	2.27	0.53
3:G:173:GLN:HB2	3:G:177:LYS:HB2	1.91	0.53
2:F:6:GLN:H	2:F:111:GLN:HE21	1.56	0.53
2:F:153:PRO:HG2	2:F:208:PRO:HG2	1.90	0.53
1:B:448:ASN:H	1:B:496:GLY:HA2	1.73	0.52
1:B:971:GLY:HA3	1:B:995:ARG:HH21	1.74	0.52
1:C:457:ARG:NH2	1:C:471:GLU:O	2.41	0.52
1:B:231:ILE:HD13	1:B:233:ILE:HG12	1.91	0.52
1:A:337:PRO:HD2	1:A:358:ILE:HG12	1.92	0.52
1:C:457:ARG:HH12	1:C:471:GLU:HB3	1.73	0.52
1:C:988:GLU:O	1:C:992:GLN:NE2	2.43	0.52
1:C:977:LEU:HD23	1:C:977:LEU:H	1.74	0.52
2:D:132:PRO:HG3	2:D:144:LEU:HB3	1.90	0.52
1:A:210:ILE:HD12	1:A:212:LEU:HD23	1.91	0.52
3:G:155:LYS:O	3:G:198:SER:OG	2.25	0.52
1:B:356:LYS:HB2	1:B:397:ALA:HB3	1.91	0.52
1:C:355:ARG:HH22	1:C:464:PHE:HB3	1.75	0.52
1:B:129:LYS:HG2	1:B:169:GLU:HG2	1.90	0.52
1:A:726:ILE:HG12	1:A:1061:VAL:HG22	1.92	0.52
1:C:318:PHE:HZ	1:C:615:VAL:HG11	1.73	0.52
2:D:130:LEU:HB2	2:D:145:GLY:H	1.74	0.52
3:E:152:VAL:HA	3:E:201:VAL:HG22	1.91	0.52
2:F:220:LYS:NZ	3:G:216:GLU:OE1	2.43	0.52
1:A:763:LEU:HD22	1:A:1008:VAL:HG21	1.92	0.51
3:I:111:VAL:O	3:I:146:TYR:OH	2.28	0.51
1:B:210:ILE:HG12	1:B:212:LEU:H	1.76	0.51
1:C:216:LEU:HD12	1:C:217:PRO:HD2	1.93	0.51
3:I:114:GLN:HE21	3:I:176:ASN:HB2	1.75	0.51
1:C:127:VAL:HG12	1:C:171:VAL:HG12	1.92	0.51
1:C:439:ASN:HD22	1:C:507:PRO:HD2	1.76	0.51
1:A:103:GLY:HA3	1:A:120:VAL:HA	1.93	0.51
2:H:33:TRP:HB2	2:H:99:VAL:HB	1.91	0.51
1:A:1047:TYR:HB2	1:A:1067:TYR:HB3	1.93	0.51
1:C:34:ARG:NH1	1:C:191:GLU:OE2	2.43	0.51
3:G:24:ARG:HB3	3:G:72:ASN:HB3	1.92	0.51
1:B:102:ARG:NH1	1:B:122:ASN:O	2.43	0.51
2:H:47:TRP:HZ2	2:H:50:ASN:HB2	1.76	0.51

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:I:38:GLN:HE21	3:I:87:ALA:HB3	1.75	0.51
2:D:33:TRP:HB2	2:D:99:VAL:HB	1.93	0.50
1:C:276:LEU:HB3	1:C:289:VAL:HG12	1.92	0.50
3:G:36:TRP:HB2	3:G:49:ILE:HG22	1.94	0.50
1:A:178:ASP:HB2	1:A:180:GLU:HG2	1.93	0.50
1:B:942:ALA:HB1	1:B:945:LEU:HD12	1.93	0.50
1:B:781:VAL:HG22	1:B:1026:ALA:HB2	1.93	0.50
1:A:360:ASN:ND2	1:A:523:THR:OG1	2.45	0.50
1:C:822:LEU:HD22	1:C:945:LEU:HD21	1.94	0.50
1:C:901:GLN:O	1:C:905:ARG:HG2	2.11	0.50
2:H:6:GLN:O	2:H:111:GLN:NE2	2.38	0.50
1:A:822:LEU:HD22	1:A:945:LEU:HD21	1.94	0.50
1:B:1103:PHE:HZ	4:B:1302:NAG:H62	1.76	0.50
1:B:707:TYR:HB3	1:C:792:PRO:HG3	1.92	0.50
2:H:153:PRO:HB2	2:H:155:PRO:HD3	1.93	0.50
1:A:143:VAL:HG21	1:A:152:TRP:HD1	1.77	0.49
2:H:206:HIS:CD2	2:H:208:PRO:HD2	2.46	0.49
3:I:124:PHE:HB2	3:I:139:VAL:HB	1.93	0.49
3:E:66:SER:OG	3:E:75:SER:OG	2.29	0.49
1:A:735:SER:HA	1:A:767:LEU:HD13	1.95	0.49
2:F:47:TRP:NE1	2:F:50:ASN:OD1	2.37	0.49
1:B:155:SER:OG	1:B:156:GLU:OE1	2.24	0.49
1:C:105:ILE:HG23	1:C:241:LEU:HD11	1.95	0.49
3:E:187:THR:OG1	3:E:190:GLN:OE1	2.30	0.49
1:C:233:ILE:HG22	1:C:234:ASN:H	1.78	0.49
2:F:131:ALA:HB1	2:F:220:LYS:HE3	1.94	0.49
2:H:19:ARG:HE	2:H:82:GLN:HB2	1.78	0.49
3:I:4:MET:HB2	3:I:104:GLY:HA2	1.95	0.49
1:B:642:VAL:HA	1:B:651:ILE:HG22	1.95	0.48
1:C:402:ILE:HD13	1:C:410:ILE:HD12	1.95	0.48
3:E:142:ILE:HG23	3:E:180:ALA:HB3	1.95	0.48
3:I:122:THR:OG1	3:I:141:LEU:O	2.30	0.48
1:A:41:LYS:NZ	1:C:562:PHE:O	2.34	0.48
1:B:1097:SER:HB3	1:B:1102:TRP:CD2	2.49	0.48
1:A:327:VAL:H	1:A:531:THR:HB	1.78	0.48
1:B:454:ARG:HD3	1:B:457:ARG:HB2	1.96	0.48
1:A:770:ILE:O	1:A:774:GLN:HG2	2.13	0.48
3:I:192:LYS:HA	3:I:195:ARG:HH21	1.77	0.48
1:A:108:THR:HG22	1:A:109:THR:HG23	1.94	0.48
1:A:1116:THR:HG23	1:A:1118:ASP:H	1.77	0.48
1:B:398:ASP:HB2	1:B:512:VAL:HB	1.96	0.48

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:472:ILE:HA	1:C:491:PRO:HD3	1.96	0.48
1:C:1073:LYS:HA	4:C:1307:NAG:H82	1.96	0.48
3:I:189:GLU:O	3:I:192:LYS:NZ	2.46	0.48
1:A:34:ARG:NH1	1:A:191:GLU:OE2	2.46	0.48
1:B:276:LEU:HD22	1:B:301:CYS:HA	1.95	0.48
1:C:781:VAL:HG22	1:C:1026:ALA:HB2	1.95	0.48
1:A:733:LYS:HE3	1:A:771:ALA:HB1	1.95	0.48
1:B:350:VAL:HG12	1:B:422:ASN:HB3	1.96	0.48
1:B:756:TYR:OH	1:B:994:ASP:OD1	2.25	0.48
1:B:880:GLY:O	1:B:884:SER:OG	2.26	0.47
1:C:294:ASP:OD1	1:C:297:SER:N	2.44	0.47
2:D:151:TYR:HE2	2:D:154:GLU:HG2	1.79	0.47
2:F:154:GLU:N	2:F:155:PRO:HD3	2.29	0.47
3:I:145:PHE:HZ	3:I:180:ALA:H	1.62	0.47
1:B:107:GLY:H	1:B:235:ILE:HG23	1.79	0.47
1:A:77:LYS:HG2	1:A:258:TRP:CH2	2.49	0.47
1:A:244:LEU:HD11	1:A:246:ARG:HH21	1.79	0.47
1:B:374:PHE:HA	1:B:436:TRP:HB3	1.96	0.47
1:C:245:HIS:HB2	1:C:259:THR:HB	1.95	0.47
3:I:27:GLY:O	3:I:72:ASN:ND2	2.48	0.47
1:A:756:TYR:OH	1:A:994:ASP:OD1	2.24	0.47
1:B:418:ILE:HA	1:B:422:ASN:HD22	1.79	0.47
1:C:418:ILE:HG23	1:C:422:ASN:HB2	1.96	0.47
2:H:19:ARG:HA	2:H:82:GLN:HA	1.95	0.47
1:C:317:ASN:HA	1:C:594:GLY:HA2	1.97	0.47
1:C:30:ASN:HA	1:C:61:ASN:HA	1.95	0.47
2:H:4:LEU:HD21	2:H:27:PHE:HE1	1.79	0.47
1:A:1074:ASN:OD1	1:B:895:GLN:NE2	2.48	0.47
3:G:122:THR:OG1	3:G:141:LEU:O	2.32	0.47
2:H:91:THR:HG23	2:H:116:THR:HA	1.97	0.47
1:C:70:VAL:O	1:C:73:THR:OG1	2.30	0.46
3:E:116:LYS:NZ	3:E:204:GLU:O	2.48	0.46
1:A:454:ARG:NH1	1:A:467:ASP:O	2.48	0.46
1:A:702:GLU:HB3	1:B:790:LYS:HZ2	1.79	0.46
1:B:424:LYS:NZ	1:B:425:LEU:O	2.46	0.46
3:E:143:SER:HA	3:E:179:ALA:HA	1.96	0.46
2:F:132:PRO:HG3	2:F:144:LEU:HB3	1.97	0.46
1:C:123:ALA:HB3	4:C:1314:NAG:H82	1.97	0.46
2:F:105:PRO:HB3	3:G:35:GLN:HG2	1.98	0.46
2:H:154:GLU:N	2:H:155:PRO:HD3	2.31	0.46
1:A:334:ASN:ND2	1:A:360:ASN:O	2.49	0.46

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:314:GLN:NE2	1:C:316:SER:O	2.49	0.46
2:F:173:PRO:HD3	3:G:171:SER:HB2	1.97	0.46
3:I:91:CYS:O	3:I:104:GLY:N	2.47	0.46
1:A:905:ARG:HH11	1:A:1036:GLN:HB2	1.80	0.46
2:H:40:ALA:HB3	2:H:43:LYS:HB2	1.98	0.46
1:B:149:ASN:OD1	1:B:149:ASN:N	2.48	0.46
1:C:986:PRO:O	1:C:990:GLU:HG2	2.15	0.46
2:H:54:ASP:OD1	2:H:54:ASP:N	2.49	0.46
2:F:147:LEU:HD11	2:F:183:SER:HB3	1.98	0.46
3:G:55:ARG:NH2	3:G:64:SER:OG	2.49	0.46
2:H:153:PRO:HG2	2:H:208:PRO:HG2	1.98	0.46
1:A:317:ASN:HA	1:A:594:GLY:HA2	1.97	0.46
1:C:598:ILE:HG23	1:C:664:ILE:HG21	1.98	0.46
1:A:14:GLN:N	1:A:158:ARG:HD2	2.31	0.45
1:B:328:ARG:NH2	1:B:580:GLN:OE1	2.48	0.45
1:C:384:PRO:HA	1:C:387:LEU:HG	1.97	0.45
2:D:154:GLU:N	2:D:155:PRO:HD3	2.32	0.45
1:A:722:VAL:HG22	1:A:1065:VAL:HG22	1.96	0.45
2:D:155:PRO:HG2	2:D:208:PRO:HD3	1.97	0.45
1:B:115:GLN:HG3	1:B:233:ILE:HG22	1.97	0.45
1:A:1094:VAL:HG13	1:B:900:MET:HE1	1.98	0.45
1:B:379:CYS:HB3	1:B:382:VAL:HG22	1.98	0.45
1:A:245:HIS:HB2	1:A:259:THR:HB	1.99	0.45
2:F:206:HIS:CD2	2:F:208:PRO:HD2	2.51	0.45
2:F:207:LYS:HB2	2:F:208:PRO:HD3	1.98	0.45
1:A:318:PHE:N	1:A:593:GLY:O	2.50	0.45
1:C:147:LYS:O	1:C:150:LYS:NZ	2.32	0.45
1:C:586:ASP:OD1	1:C:587:ILE:N	2.49	0.45
1:A:480:CYS:HB3	1:A:486:PHE:H	1.81	0.45
2:H:51:ILE:HD13	2:H:52:ASN:H	1.82	0.45
1:C:644:GLN:NE2	1:C:645:THR:O	2.50	0.45
2:D:130:LEU:HD23	3:E:124:PHE:HD2	1.82	0.45
1:A:889:GLY:HA3	1:A:1034:LEU:HD23	1.99	0.45
1:B:96:GLU:O	1:B:188:ASN:ND2	2.50	0.45
1:B:458:LYS:H	1:B:458:LYS:HD2	1.82	0.45
1:C:100:ILE:HD13	1:C:263:ALA:HB2	1.99	0.45
1:C:342:PHE:HE1	1:C:434:ILE:HG21	1.82	0.45
2:D:105:PRO:HB3	3:E:35:GLN:HG2	1.99	0.45
2:F:129:PRO:HA	2:F:146:CYS:HA	1.98	0.45
1:B:906:PHE:HA	1:B:909:ILE:HG12	1.98	0.44
3:E:146:TYR:HB3	3:E:147:PRO:HD3	1.99	0.44

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:731:MET:SD	1:A:1018:ILE:HG13	2.57	0.44
1:B:909:ILE:HD13	1:B:1049:LEU:HD21	1.98	0.44
3:I:24:ARG:NH2	3:I:95:ASP:OD1	2.37	0.44
1:A:1109:PHE:HD2	1:A:1111:GLU:HG3	1.82	0.44
1:C:106:PHE:HB3	1:C:235:ILE:HD13	2.00	0.44
1:C:465:GLU:HG2	1:C:466:ARG:H	1.83	0.44
2:H:96:CYS:O	2:H:110:GLY:N	2.50	0.44
1:C:408:ARG:HG2	3:I:28:SER:HB2	1.99	0.44
1:A:1097:SER:HB3	1:A:1102:TRP:CD2	2.52	0.44
1:B:559:PHE:HB2	1:B:577:ARG:HH21	1.82	0.44
1:B:905:ARG:HH11	1:B:1036:GLN:HB2	1.82	0.44
1:C:788:ILE:HG23	1:C:876:ALA:HB2	1.99	0.44
2:F:172:PHE:HA	3:G:171:SER:HB2	1.99	0.44
1:A:117:LEU:HD22	1:A:231:ILE:HG21	2.00	0.44
1:B:328:ARG:NH1	1:B:531:THR:O	2.46	0.44
3:I:173:GLN:HB2	3:I:177:LYS:HB2	1.99	0.44
1:B:726:ILE:HG12	1:B:1061:VAL:HG22	2.00	0.43
2:H:67:ARG:NH1	2:H:90:ASP:OD2	2.48	0.43
1:B:108:THR:OG1	1:B:234:ASN:O	2.29	0.43
1:A:41:LYS:HD2	1:C:562:PHE:HD2	1.84	0.43
1:B:132:GLU:HB2	1:B:164:ASN:HB2	1.99	0.43
1:C:905:ARG:HH11	1:C:1036:GLN:HB2	1.81	0.43
3:G:197:TYR:HE2	3:G:214:PRO:HB3	1.82	0.43
1:A:231:ILE:HG13	1:A:232:GLY:H	1.82	0.43
3:I:119:PRO:HB3	3:I:145:PHE:HB3	1.99	0.43
1:A:770:ILE:HD11	1:A:1012:LEU:HD23	2.00	0.43
1:B:612:TYR:HB3	1:B:615:VAL:HG21	2.01	0.43
1:C:770:ILE:O	1:C:774:GLN:HG2	2.17	0.43
2:H:207:LYS:HB2	2:H:208:PRO:HD3	2.00	0.43
1:B:212:LEU:HD13	1:B:217:PRO:HB3	2.01	0.43
1:B:912:THR:OG1	1:B:914:ASN:OD1	2.26	0.43
1:C:296:LEU:HG	1:C:300:LYS:HE3	1.99	0.43
2:H:61:VAL:HG12	2:H:64:VAL:HG22	2.01	0.43
1:A:458:LYS:NZ	1:A:474:GLN:H	2.16	0.43
1:B:958:ALA:HB2	1:B:1014:ARG:HH12	1.84	0.43
1:B:1094:VAL:HG23	1:B:1096:VAL:HG23	2.01	0.43
1:C:83:VAL:HG12	1:C:237:ARG:HG2	2.01	0.43
3:I:24:ARG:HH12	3:I:95:ASP:HB2	1.84	0.43
3:I:141:LEU:HD13	3:I:181:SER:HB2	2.01	0.43
1:A:378:LYS:NZ	3:G:32:ASN:O	2.52	0.43
1:B:535:LYS:HG3	1:B:536:ASN:HD22	1.83	0.43

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:E:32:ASN:ND2	3:E:94:TYR:O	2.51	0.43
3:G:4:MET:HB2	3:G:104:GLY:HA2	2.00	0.43
3:G:155:LYS:HE2	3:G:160:PRO:HG3	2.00	0.43
1:B:229:LEU:HA	1:B:230:PRO:HD3	1.90	0.42
2:D:40:ALA:HB3	2:D:43:LYS:HB2	2.02	0.42
1:B:462:LYS:HB3	1:B:462:LYS:HZ2	1.82	0.42
1:B:731:MET:HG2	1:B:732:THR:H	1.83	0.42
1:A:497:PHE:CG	1:A:507:PRO:HG3	2.55	0.42
1:B:717:ASN:HB3	1:B:1070:ALA:HB3	2.01	0.42
1:C:195:LYS:HE3	1:C:202:LYS:HD2	2.00	0.42
1:C:412:PRO:HD3	1:C:425:LEU:HD22	1.99	0.42
1:C:581:THR:OG1	1:C:582:LEU:N	2.52	0.42
2:D:63:SER:O	2:D:67:ARG:NH2	2.49	0.42
3:G:11:SER:OG	3:G:110:THR:OG1	2.36	0.42
1:A:70:VAL:HG23	1:A:76:THR:HB	2.02	0.42
2:D:6:GLN:HB3	2:D:22:CYS:SG	2.59	0.42
3:I:139:VAL:HG22	3:I:183:TYR:HE1	1.83	0.42
1:B:64:TRP:HE1	1:B:264:ALA:HB1	1.85	0.42
1:C:21:ARG:NH1	1:C:79:PHE:O	2.52	0.42
1:C:451:TYR:HB2	1:C:495:TYR:CE2	2.54	0.42
1:A:141:LEU:O	1:A:244:LEU:HB2	2.19	0.42
1:A:186:PHE:HD2	1:A:213:VAL:HA	1.83	0.42
1:A:452:LEU:HB3	1:A:492:LEU:HB3	2.01	0.42
1:A:912:THR:OG1	1:A:914:ASN:OD1	2.30	0.42
1:B:616:ASN:HB3	1:B:618:THR:HG22	2.02	0.42
1:C:125:ASN:HB3	1:C:174:PRO:HA	2.01	0.42
3:I:12:GLU:HG2	3:I:13:SER:H	1.85	0.42
3:I:114:GLN:NE2	3:I:175:ASN:O	2.52	0.42
1:A:490:PHE:CE2	1:A:492:LEU:HB2	2.55	0.42
1:B:53:ASP:OD1	1:B:54:LEU:N	2.44	0.42
1:C:756:TYR:OH	1:C:994:ASP:OD1	2.26	0.42
3:E:33:TYR:HB3	3:E:51:GLU:HA	2.02	0.42
1:B:770:ILE:O	1:B:774:GLN:HG2	2.20	0.42
1:B:802:PHE:HD1	1:B:805:ILE:HD11	1.85	0.42
1:B:901:GLN:O	1:B:905:ARG:HG2	2.20	0.42
1:C:739:THR:O	1:C:743:CYS:N	2.52	0.42
1:C:1029:MET:HE1	1:C:1053:PRO:HB3	2.02	0.42
1:A:294:ASP:OD1	1:A:297:SER:N	2.44	0.41
1:B:123:ALA:HB3	4:B:1314:NAG:H82	2.02	0.41
1:B:988:GLU:O	1:B:992:GLN:HG2	2.20	0.41
1:C:190:ARG:HG2	1:C:207:HIS:HD2	1.85	0.41

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:666:ILE:HD11	1:C:672:ALA:HB2	2.02	0.41
2:D:64:VAL:HB	2:D:68:PHE:CD1	2.55	0.41
3:G:17:THR:HG22	3:G:79:SER:HA	2.02	0.41
1:A:214:ARG:HA	1:A:214:ARG:HE	1.85	0.41
1:A:659:SER:HB3	1:A:698:SER:HB3	2.02	0.41
1:B:29:THR:HG21	1:B:266:TYR:HE2	1.84	0.41
1:B:204:TYR:HB3	1:B:223:LEU:HB3	2.01	0.41
1:B:239:GLN:HG2	1:B:240:THR:H	1.85	0.41
1:B:341:VAL:HG11	1:B:397:ALA:HB1	2.02	0.41
1:B:1043:CYS:SG	1:B:1064:HIS:ND1	2.92	0.41
2:H:132:PRO:HG3	2:H:144:LEU:HB3	2.02	0.41
2:H:151:TYR:OH	2:H:184:LEU:HB2	2.21	0.41
1:B:353:TRP:CD1	1:B:353:TRP:H	2.38	0.41
1:C:200:TYR:HE1	1:C:230:PRO:HB3	1.85	0.41
2:F:51:ILE:HG13	2:F:58:LYS:HG2	2.02	0.41
1:A:117:LEU:HD13	1:A:130:VAL:HG22	2.01	0.41
1:B:178:ASP:OD2	1:B:182:LYS:NZ	2.54	0.41
1:B:722:VAL:HG22	1:B:1065:VAL:HG22	2.03	0.41
1:C:770:ILE:HD11	1:C:1012:LEU:HD23	2.02	0.41
1:C:976:VAL:HG13	1:C:979:ASP:HB2	2.02	0.41
3:E:98:ASN:O	3:E:100:ASN:ND2	2.54	0.41
1:B:48:LEU:HD22	1:B:306:PHE:HE1	1.85	0.41
1:B:143:VAL:HG21	1:B:179:LEU:HD11	2.02	0.41
1:C:327:VAL:HG22	1:C:542:ASN:HB3	2.03	0.41
2:F:35:SER:HB3	2:F:50:ASN:ND2	2.36	0.41
1:A:16:VAL:HA	4:A:1313:NAG:H82	2.03	0.41
1:A:788:ILE:HG23	1:A:876:ALA:HB2	2.02	0.41
1:C:239:GLN:HG2	1:C:240:THR:H	1.85	0.41
1:A:78:ARG:NE	1:A:80:ASP:OD2	2.51	0.41
1:A:153:MET:HE1	4:A:1315:NAG:H3	2.02	0.41
2:D:215:LYS:NZ	3:E:129:GLU:OE1	2.42	0.41
2:H:176:LEU:HD13	2:H:182:TYR:CZ	2.55	0.41
3:I:156:ALA:HA	3:I:197:TYR:HA	2.03	0.41
1:A:985:ASP:OD1	1:A:985:ASP:N	2.49	0.41
1:B:296:LEU:HD13	1:B:608:VAL:HG21	2.02	0.41
1:B:1047:TYR:HB2	1:B:1067:TYR:HB3	2.02	0.41
1:C:353:TRP:HZ3	1:C:355:ARG:HB2	1.85	0.41
2:D:125:PRO:HD2	2:D:211:THR:HG21	2.03	0.41
3:E:119:PRO:HG3	3:E:203:HIS:HD1	1.86	0.41
2:F:23:ALA:HA	2:F:78:SER:HA	2.03	0.41
1:C:41:LYS:HE3	1:C:225:PRO:HG2	2.03	0.41

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:415:THR:HB	1:C:419:ALA:HB2	2.03	0.41
1:A:328:ARG:NH2	1:A:578:ASP:OD2	2.54	0.40
1:A:973:ILE:HD13	1:A:984:LEU:HD22	2.03	0.40
3:E:130:GLU:H	3:E:130:GLU:HG3	1.62	0.40
1:A:403:ARG:HE	1:A:405:ASP:HB2	1.85	0.40
2:D:200:TYR:HD1	2:D:200:TYR:HA	1.76	0.40
1:A:173:GLN:H	1:A:173:GLN:HG3	1.65	0.40
1:B:90:VAL:HG13	1:B:267:VAL:HG13	2.03	0.40
1:B:947:LYS:HE2	1:B:947:LYS:HB2	1.91	0.40
1:C:457:ARG:HH22	1:C:471:GLU:HB3	1.86	0.40
1:B:770:ILE:HD11	1:B:1012:LEU:HD23	2.03	0.40
1:B:666:ILE:HD12	1:B:670:ILE:HG22	2.03	0.40
1:C:127:VAL:HG11	4:C:1314:NAG:H62	2.03	0.40
1:C:398:ASP:O	1:C:512:VAL:N	2.54	0.40
2:F:158:VAL:HA	2:F:204:VAL:HG13	2.02	0.40
3:G:40:ARG:HB2	3:G:43:SER:HB2	2.04	0.40
3:G:152:VAL:HA	3:G:201:VAL:HA	2.04	0.40
3:G:198:SER:HB2	3:G:209:GLU:HB2	2.03	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	1068/1288 (83%)	1010 (95%)	58 (5%)	0	100	100
1	B	1068/1288 (83%)	1015 (95%)	53 (5%)	0	100	100
1	C	1068/1288 (83%)	1013 (95%)	55 (5%)	0	100	100
2	D	223/225 (99%)	203 (91%)	20 (9%)	0	100	100
2	F	223/225 (99%)	196 (88%)	27 (12%)	0	100	100
2	H	223/225 (99%)	198 (89%)	25 (11%)	0	100	100

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
3	E	213/218 (98%)	195 (92%)	18 (8%)	0	100	100
3	G	213/218 (98%)	194 (91%)	19 (9%)	0	100	100
3	I	213/218 (98%)	193 (91%)	20 (9%)	0	100	100
All	All	4512/5193 (87%)	4217 (94%)	295 (6%)	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	922/1111 (83%)	888 (96%)	34 (4%)	29	59
1	B	922/1111 (83%)	887 (96%)	35 (4%)	28	58
1	C	922/1111 (83%)	886 (96%)	36 (4%)	27	58
2	D	189/189 (100%)	178 (94%)	11 (6%)	17	45
2	F	189/189 (100%)	177 (94%)	12 (6%)	15	43
2	H	189/189 (100%)	180 (95%)	9 (5%)	21	51
3	E	188/191 (98%)	179 (95%)	9 (5%)	21	51
3	G	188/191 (98%)	173 (92%)	15 (8%)	10	34
3	I	188/191 (98%)	181 (96%)	7 (4%)	29	59
All	All	3897/4473 (87%)	3729 (96%)	168 (4%)	27	54

All (168) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	16	VAL
1	A	70	VAL
1	A	83	VAL
1	A	145	TYR
1	A	149	ASN
1	A	173	GLN

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	A	202	LYS
1	A	210	ILE
1	A	244	LEU
1	A	248	TYR
1	A	249	LEU
1	A	293	LEU
1	A	326	ILE
1	A	340	GLU
1	A	356	LYS
1	A	408	ARG
1	A	433	VAL
1	A	461	LEU
1	A	468	ILE
1	A	472	ILE
1	A	483	VAL
1	A	505	TYR
1	A	510	VAL
1	A	517	LEU
1	A	534	VAL
1	A	538	CYS
1	A	590	CYS
1	A	753	LEU
1	A	966	LEU
1	A	983	ARG
1	A	990	GLU
1	A	992	GLN
1	A	1032	CYS
1	A	1104	VAL
1	B	16	VAL
1	B	130	VAL
1	B	131	CYS
1	B	147	LYS
1	B	150	LYS
1	B	187	LYS
1	B	231	ILE
1	B	290	ASP
1	B	291	CYS
1	B	301	CYS
1	B	319	ARG
1	B	320	VAL
1	B	336	CYS
1	B	350	VAL

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	B	356	LYS
1	B	433	VAL
1	B	440	ASN
1	B	444	LYS
1	B	462	LYS
1	B	500	THR
1	B	512	VAL
1	B	524	VAL
1	B	538	CYS
1	B	546	LEU
1	B	569	ILE
1	B	616	ASN
1	B	617	CYS
1	B	752	LEU
1	B	753	LEU
1	B	795	LYS
1	B	858	LEU
1	B	966	LEU
1	B	976	VAL
1	B	1001	LEU
1	B	1104	VAL
1	C	16	VAL
1	C	68	ILE
1	C	70	VAL
1	C	105	ILE
1	C	114	THR
1	C	120	VAL
1	C	127	VAL
1	C	182	LYS
1	C	197	ILE
1	C	202	LYS
1	C	229	LEU
1	C	233	ILE
1	C	234	ASN
1	C	240	THR
1	C	244	LEU
1	C	259	THR
1	C	289	VAL
1	C	304	LYS
1	C	312	ILE
1	C	326	ILE
1	C	336	CYS

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	C	378	LYS
1	C	441	LEU
1	C	455	LEU
1	C	461	LEU
1	C	468	ILE
1	C	472	ILE
1	C	488	CYS
1	C	495	TYR
1	C	524	VAL
1	C	615	VAL
1	C	753	LEU
1	C	860	VAL
1	C	976	VAL
1	C	1104	VAL
1	C	1125	ASN
2	D	50	ASN
2	D	60	TYR
2	D	70	ILE
2	D	83	MET
2	D	86	VAL
2	D	98	ARG
2	D	137	THR
2	D	146	CYS
2	D	190	VAL
2	D	220	LYS
2	D	225	THR
3	E	17	THR
3	E	108	GLU
3	E	112	LEU
3	E	130	GLU
3	E	137	THR
3	E	142	ILE
3	E	187	THR
3	E	191	TRP
3	E	204	GLU
2	F	13	GLN
2	F	76	LYS
2	F	83	MET
2	F	116	THR
2	F	136	SER
2	F	146	CYS
2	F	161	ASN

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
2	F	172	PHE
2	F	187	VAL
2	F	189	THR
2	F	201	ILE
2	F	204	VAL
3	G	16	LYS
3	G	24	ARG
3	G	29	ILE
3	G	35	GLN
3	G	67	ILE
3	G	108	GLU
3	G	130	GLU
3	G	131	LEU
3	G	134	ASN
3	G	150	VAL
3	G	168	THR
3	G	189	GLU
3	G	190	GLN
3	G	192	LYS
3	G	194	HIS
2	H	13	GLN
2	H	18	LEU
2	H	50	ASN
2	H	51	ILE
2	H	52	ASN
2	H	136	SER
2	H	146	CYS
2	H	201	ILE
2	H	213	VAL
3	I	29	ILE
3	I	49	ILE
3	I	130	GLU
3	I	131	LEU
3	I	134	ASN
3	I	190	GLN
3	I	192	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (113) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	14	GLN
1	A	23	GLN

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	A	49	HIS
1	A	99	ASN
1	A	121	ASN
1	A	134	GLN
1	A	183	GLN
1	A	360	ASN
1	A	409	GLN
1	A	474	GLN
1	A	493	GLN
1	A	655	HIS
1	A	690	GLN
1	A	762	GLN
1	A	774	GLN
1	A	804	GLN
1	A	872	GLN
1	A	969	ASN
1	A	1002	GLN
1	A	1011	GLN
1	B	23	GLN
1	B	30	ASN
1	B	49	HIS
1	B	115	GLN
1	B	137	ASN
1	B	183	GLN
1	B	188	ASN
1	B	218	GLN
1	B	280	ASN
1	B	360	ASN
1	B	409	GLN
1	B	414	GLN
1	B	437	ASN
1	B	460	ASN
1	B	474	GLN
1	B	493	GLN
1	B	498	GLN
1	B	536	ASN
1	B	542	ASN
1	B	613	GLN
1	B	913	GLN
1	B	978	ASN
1	B	1002	GLN
1	B	1011	GLN

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	C	23	GLN
1	C	49	HIS
1	C	121	ASN
1	C	125	ASN
1	C	134	GLN
1	C	183	GLN
1	C	207	HIS
1	C	218	GLN
1	C	314	GLN
1	C	439	ASN
1	C	440	ASN
1	C	474	GLN
1	C	493	GLN
1	C	580	GLN
1	C	644	GLN
1	C	690	GLN
1	C	872	GLN
1	C	914	ASN
1	C	920	GLN
1	C	935	GLN
1	C	949	GLN
1	C	953	ASN
1	C	954	GLN
1	C	992	GLN
1	C	1002	GLN
1	C	1011	GLN
1	C	1048	HIS
1	C	1125	ASN
2	D	39	GLN
2	D	52	ASN
2	D	74	ASN
2	D	111	GLN
2	D	203	ASN
2	D	206	HIS
3	E	8	HIS
3	E	32	ASN
3	E	39	GLN
3	E	98	ASN
3	E	100	ASN
3	E	200	GLN
2	F	6	GLN
2	F	13	GLN

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
2	F	52	ASN
2	F	77	ASN
2	F	111	GLN
2	F	206	HIS
3	G	8	HIS
3	G	32	ASN
3	G	35	GLN
3	G	39	GLN
3	G	92	GLN
3	G	98	ASN
3	G	99	HIS
3	G	100	ASN
3	G	175	ASN
3	G	190	GLN
3	G	200	GLN
2	H	6	GLN
2	H	50	ASN
2	H	52	ASN
2	H	84	ASN
2	H	205	ASN
3	I	32	ASN
3	I	38	GLN
3	I	72	ASN
3	I	114	GLN
3	I	175	ASN
3	I	190	GLN
3	I	200	GLN

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 ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry

45 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
4	NAG	A	1305	1	14,14,15	0.34	0	17,19,21	0.41	0
4	NAG	B	1306	1	14,14,15	0.22	0	17,19,21	0.41	0
4	NAG	C	1311	1	14,14,15	0.21	0	17,19,21	0.41	0
4	NAG	C	1315	1	14,14,15	0.45	0	17,19,21	1.26	1 (5%)
4	NAG	B	1301	1	14,14,15	0.23	0	17,19,21	0.44	0
4	NAG	B	1309	1	14,14,15	0.21	0	17,19,21	0.40	0
4	NAG	B	1307	1	14,14,15	0.22	0	17,19,21	0.41	0
4	NAG	A	1308	1	14,14,15	0.22	0	17,19,21	0.43	0
4	NAG	A	1309	1	14,14,15	0.26	0	17,19,21	0.53	0
4	NAG	A	1302	1	14,14,15	0.23	0	17,19,21	0.42	0
4	NAG	C	1304	1	14,14,15	0.26	0	17,19,21	0.52	0
4	NAG	C	1312	1	14,14,15	0.22	0	17,19,21	0.45	0
4	NAG	B	1313	1	14,14,15	0.22	0	17,19,21	0.43	0
4	NAG	B	1310	1	14,14,15	0.44	0	17,19,21	1.25	1 (5%)
4	NAG	B	1304	1	14,14,15	0.23	0	17,19,21	0.43	0
4	NAG	A	1303	1	14,14,15	0.24	0	17,19,21	0.43	0
4	NAG	A	1306	1	14,14,15	0.22	0	17,19,21	0.44	0
4	NAG	B	1314	1	14,14,15	0.21	0	17,19,21	0.42	0
4	NAG	B	1303	1	14,14,15	0.22	0	17,19,21	0.42	0
4	NAG	A	1312	1	14,14,15	0.22	0	17,19,21	0.43	0
4	NAG	C	1306	1	14,14,15	0.23	0	17,19,21	0.42	0
4	NAG	C	1305	1	14,14,15	0.20	0	17,19,21	0.41	0
4	NAG	A	1307	1	14,14,15	0.32	0	17,19,21	0.41	0
4	NAG	C	1301	1	14,14,15	0.20	0	17,19,21	0.42	0
4	NAG	A	1304	1	14,14,15	0.26	0	17,19,21	0.53	0
4	NAG	C	1310	1	14,14,15	0.22	0	17,19,21	0.42	0
4	NAG	B	1311	1	14,14,15	0.21	0	17,19,21	0.42	0
4	NAG	B	1305	1	14,14,15	0.22	0	17,19,21	0.42	0
4	NAG	A	1313	1	14,14,15	0.20	0	17,19,21	0.40	0
4	NAG	C	1308	1	14,14,15	0.22	0	17,19,21	0.43	0
4	NAG	C	1313	1	14,14,15	0.43	0	17,19,21	0.39	0
4	NAG	C	1307	1	14,14,15	0.20	0	17,19,21	0.44	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
4	NAG	B	1315	1	14,14,15	0.23	0	17,19,21	0.41	0
4	NAG	B	1308	1	14,14,15	0.22	0	17,19,21	0.44	0
4	NAG	A	1314	1	14,14,15	0.20	0	17,19,21	0.45	0
4	NAG	A	1301	1	14,14,15	0.26	0	17,19,21	0.43	0
4	NAG	B	1312	1	14,14,15	0.22	0	17,19,21	0.42	0
4	NAG	C	1314	1	14,14,15	0.22	0	17,19,21	0.41	0
4	NAG	C	1302	1	14,14,15	0.23	0	17,19,21	0.39	0
4	NAG	A	1310	1	14,14,15	0.27	0	17,19,21	0.53	0
4	NAG	C	1309	1	14,14,15	0.22	0	17,19,21	0.42	0
4	NAG	C	1303	1	14,14,15	0.25	0	17,19,21	0.52	0
4	NAG	A	1315	1	14,14,15	0.20	0	17,19,21	0.45	0
4	NAG	A	1311	1	14,14,15	0.22	0	17,19,21	0.43	0
4	NAG	B	1302	1	14,14,15	0.20	0	17,19,21	0.43	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
4	NAG	A	1305	1	-	1/6/23/26	0/1/1/1
4	NAG	B	1306	1	-	0/6/23/26	0/1/1/1
4	NAG	C	1311	1	-	2/6/23/26	0/1/1/1
4	NAG	C	1315	1	-	5/6/23/26	0/1/1/1
4	NAG	B	1301	1	-	0/6/23/26	0/1/1/1
4	NAG	B	1309	1	-	2/6/23/26	0/1/1/1
4	NAG	B	1307	1	-	2/6/23/26	0/1/1/1
4	NAG	A	1308	1	-	2/6/23/26	0/1/1/1
4	NAG	A	1309	1	-	3/6/23/26	0/1/1/1
4	NAG	A	1302	1	-	2/6/23/26	0/1/1/1
4	NAG	C	1304	1	-	1/6/23/26	0/1/1/1
4	NAG	C	1312	1	-	0/6/23/26	0/1/1/1
4	NAG	B	1313	1	-	4/6/23/26	0/1/1/1
4	NAG	B	1310	1	-	2/6/23/26	0/1/1/1
4	NAG	B	1304	1	-	2/6/23/26	0/1/1/1
4	NAG	A	1303	1	-	1/6/23/26	0/1/1/1
4	NAG	A	1306	1	-	2/6/23/26	0/1/1/1
4	NAG	B	1314	1	-	2/6/23/26	0/1/1/1
4	NAG	B	1303	1	-	2/6/23/26	0/1/1/1

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	NAG	A	1312	1	-	2/6/23/26	0/1/1/1
4	NAG	C	1306	1	-	0/6/23/26	0/1/1/1
4	NAG	C	1305	1	-	2/6/23/26	0/1/1/1
4	NAG	A	1307	1	-	0/6/23/26	0/1/1/1
4	NAG	C	1301	1	-	4/6/23/26	0/1/1/1
4	NAG	A	1304	1	-	3/6/23/26	0/1/1/1
4	NAG	C	1310	1	-	0/6/23/26	0/1/1/1
4	NAG	B	1311	1	-	2/6/23/26	0/1/1/1
4	NAG	B	1305	1	-	2/6/23/26	0/1/1/1
4	NAG	A	1313	1	-	0/6/23/26	0/1/1/1
4	NAG	C	1308	1	-	2/6/23/26	0/1/1/1
4	NAG	C	1313	1	-	2/6/23/26	0/1/1/1
4	NAG	C	1307	1	-	2/6/23/26	0/1/1/1
4	NAG	B	1315	1	-	0/6/23/26	0/1/1/1
4	NAG	B	1308	1	-	0/6/23/26	0/1/1/1
4	NAG	A	1314	1	-	0/6/23/26	0/1/1/1
4	NAG	A	1301	1	-	2/6/23/26	0/1/1/1
4	NAG	B	1312	1	-	2/6/23/26	0/1/1/1
4	NAG	C	1314	1	-	0/6/23/26	0/1/1/1
4	NAG	C	1302	1	-	2/6/23/26	0/1/1/1
4	NAG	A	1310	1	-	1/6/23/26	0/1/1/1
4	NAG	C	1309	1	-	0/6/23/26	0/1/1/1
4	NAG	C	1303	1	-	3/6/23/26	0/1/1/1
4	NAG	A	1315	1	-	2/6/23/26	0/1/1/1
4	NAG	A	1311	1	-	0/6/23/26	0/1/1/1
4	NAG	B	1302	1	-	0/6/23/26	0/1/1/1

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	B	1310	NAG	C1-O5-C5	4.73	118.60	112.19
4	C	1315	NAG	C2-N2-C7	4.27	128.99	122.90

There are no chirality outliers.

All (68) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	C	1302	NAG	C4-C5-C6-O6
4	C	1302	NAG	O5-C5-C6-O6
4	C	1303	NAG	O5-C5-C6-O6
4	B	1307	NAG	C4-C5-C6-O6
4	B	1305	NAG	O5-C5-C6-O6
4	B	1311	NAG	O5-C5-C6-O6
4	B	1314	NAG	O5-C5-C6-O6
4	B	1312	NAG	O5-C5-C6-O6
4	B	1305	NAG	C4-C5-C6-O6
4	B	1312	NAG	C4-C5-C6-O6
4	A	1301	NAG	O5-C5-C6-O6
4	A	1302	NAG	O5-C5-C6-O6
4	C	1307	NAG	O5-C5-C6-O6
4	B	1311	NAG	C4-C5-C6-O6
4	A	1312	NAG	O5-C5-C6-O6
4	C	1303	NAG	C4-C5-C6-O6
4	B	1313	NAG	O5-C5-C6-O6
4	B	1303	NAG	O5-C5-C6-O6
4	A	1312	NAG	C4-C5-C6-O6
4	C	1307	NAG	C4-C5-C6-O6
4	A	1315	NAG	C8-C7-N2-C2
4	A	1315	NAG	O7-C7-N2-C2
4	B	1304	NAG	C8-C7-N2-C2
4	B	1304	NAG	O7-C7-N2-C2
4	B	1310	NAG	C8-C7-N2-C2
4	B	1310	NAG	O7-C7-N2-C2
4	B	1313	NAG	C8-C7-N2-C2
4	B	1313	NAG	O7-C7-N2-C2
4	C	1301	NAG	C8-C7-N2-C2
4	C	1301	NAG	O7-C7-N2-C2
4	C	1315	NAG	C8-C7-N2-C2
4	C	1315	NAG	O7-C7-N2-C2
4	A	1301	NAG	C4-C5-C6-O6
4	A	1304	NAG	O5-C5-C6-O6
4	A	1308	NAG	O5-C5-C6-O6
4	A	1302	NAG	C4-C5-C6-O6
4	B	1313	NAG	C4-C5-C6-O6
4	C	1301	NAG	C4-C5-C6-O6
4	B	1307	NAG	O5-C5-C6-O6
4	C	1305	NAG	C4-C5-C6-O6
4	C	1313	NAG	O5-C5-C6-O6
4	A	1304	NAG	C4-C5-C6-O6
4	A	1308	NAG	C4-C5-C6-O6

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms
4	C	1308	NAG	O5-C5-C6-O6
4	B	1314	NAG	C4-C5-C6-O6
4	C	1308	NAG	C4-C5-C6-O6
4	C	1315	NAG	O5-C5-C6-O6
4	C	1311	NAG	C4-C5-C6-O6
4	C	1315	NAG	C4-C5-C6-O6
4	C	1305	NAG	O5-C5-C6-O6
4	C	1311	NAG	O5-C5-C6-O6
4	C	1301	NAG	O5-C5-C6-O6
4	A	1303	NAG	O5-C5-C6-O6
4	A	1309	NAG	C4-C5-C6-O6
4	A	1309	NAG	O5-C5-C6-O6
4	B	1309	NAG	C4-C5-C6-O6
4	A	1306	NAG	C4-C5-C6-O6
4	B	1309	NAG	O5-C5-C6-O6
4	B	1303	NAG	C4-C5-C6-O6
4	A	1304	NAG	C3-C2-N2-C7
4	A	1309	NAG	C3-C2-N2-C7
4	A	1310	NAG	C3-C2-N2-C7
4	C	1303	NAG	C3-C2-N2-C7
4	C	1304	NAG	C3-C2-N2-C7
4	A	1305	NAG	C4-C5-C6-O6
4	C	1313	NAG	C4-C5-C6-O6
4	A	1306	NAG	O5-C5-C6-O6
4	C	1315	NAG	C3-C2-N2-C7

There are no ring outliers.

8 monomers are involved in 9 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	C	1315	NAG	1	0
4	C	1312	NAG	1	0
4	B	1314	NAG	1	0
4	A	1313	NAG	1	0
4	C	1307	NAG	1	0
4	C	1314	NAG	2	0
4	A	1315	NAG	1	0
4	B	1302	NAG	1	0

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.

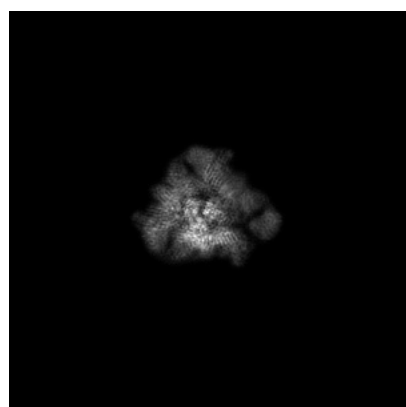
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-32639. These allow visual inspection of the internal detail of the map and identification of artifacts.

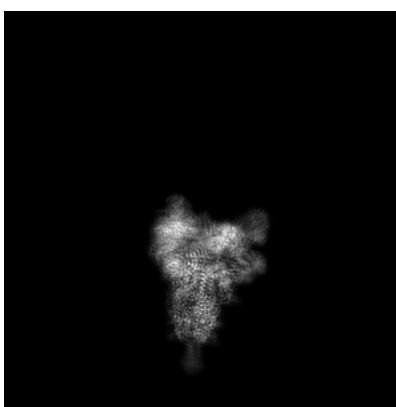
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

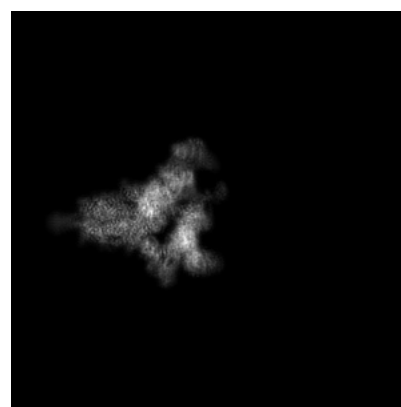
6.1.1 Primary map



X



Y



Z

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

6.2 Central slices [i](#)

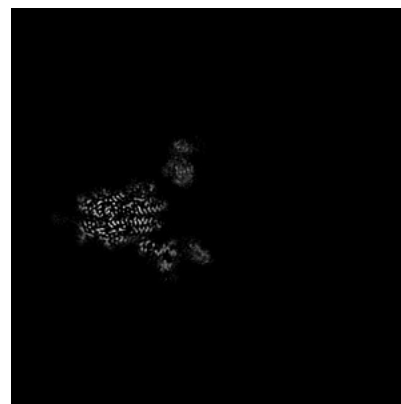
6.2.1 Primary map



X Index: 240



Y Index: 240

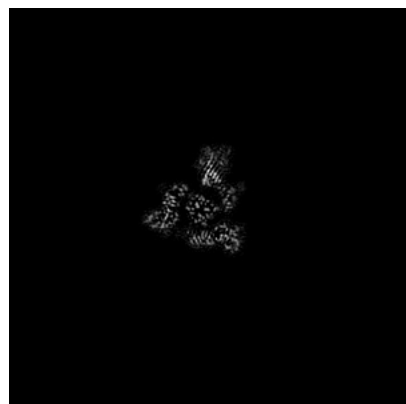


Z Index: 240

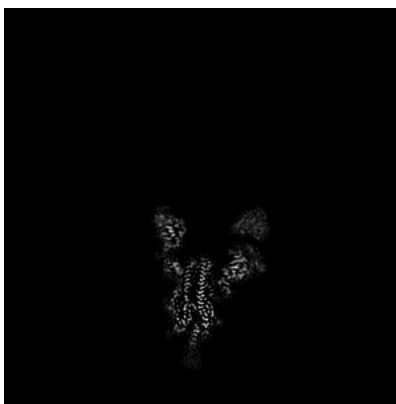
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

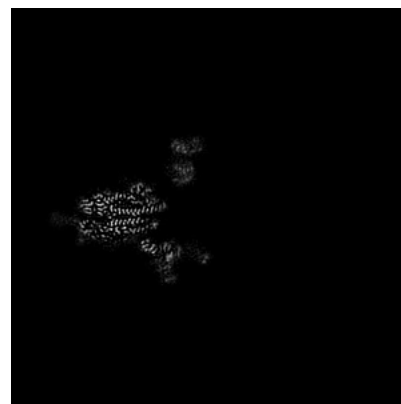
6.3.1 Primary map



X Index: 168



Y Index: 236

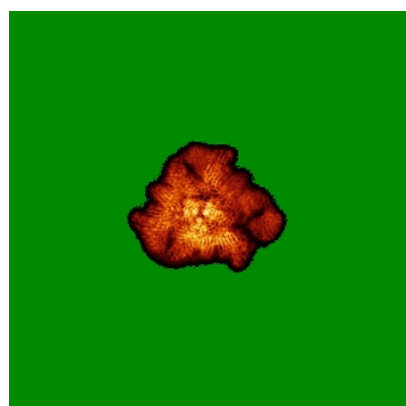


Z Index: 237

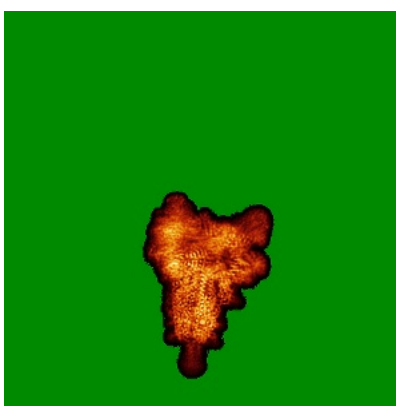
The images above show the largest variance slices of the map in three orthogonal directions.

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

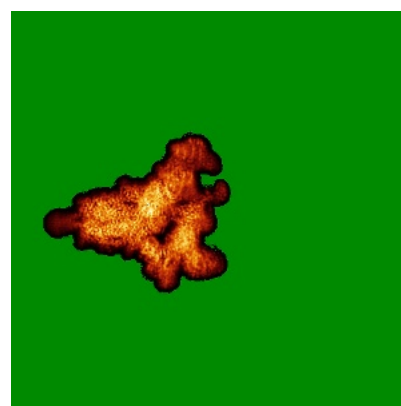
6.4.1 Primary map



X



Y

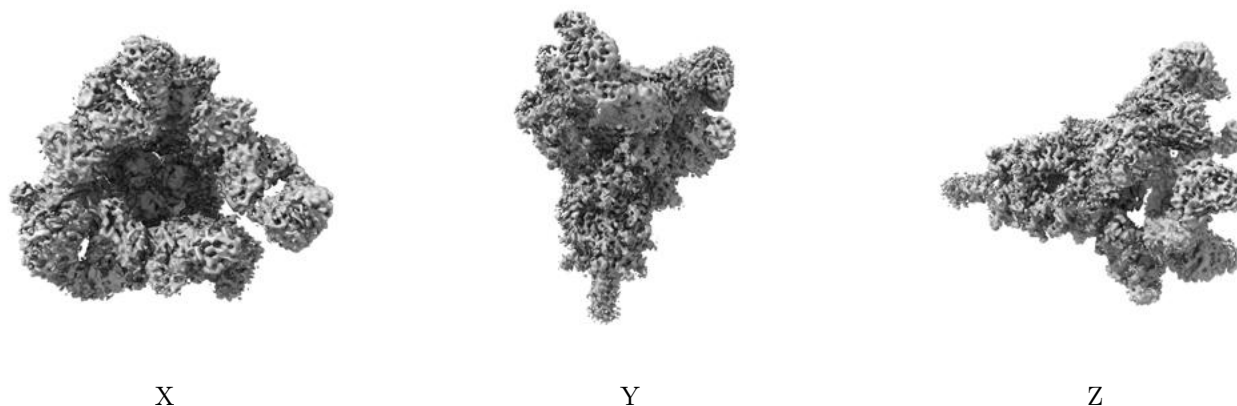


Z

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

6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.01. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

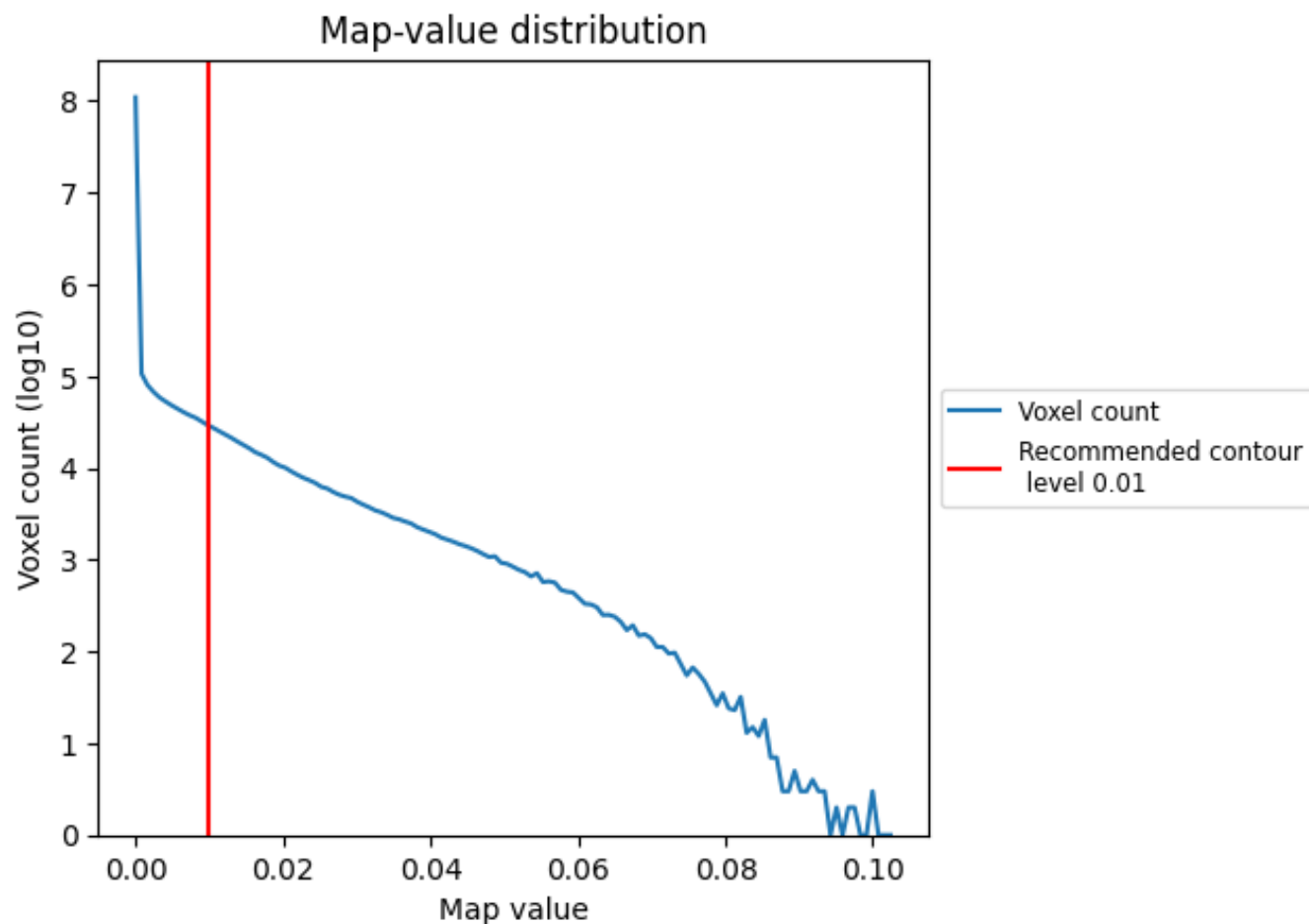
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

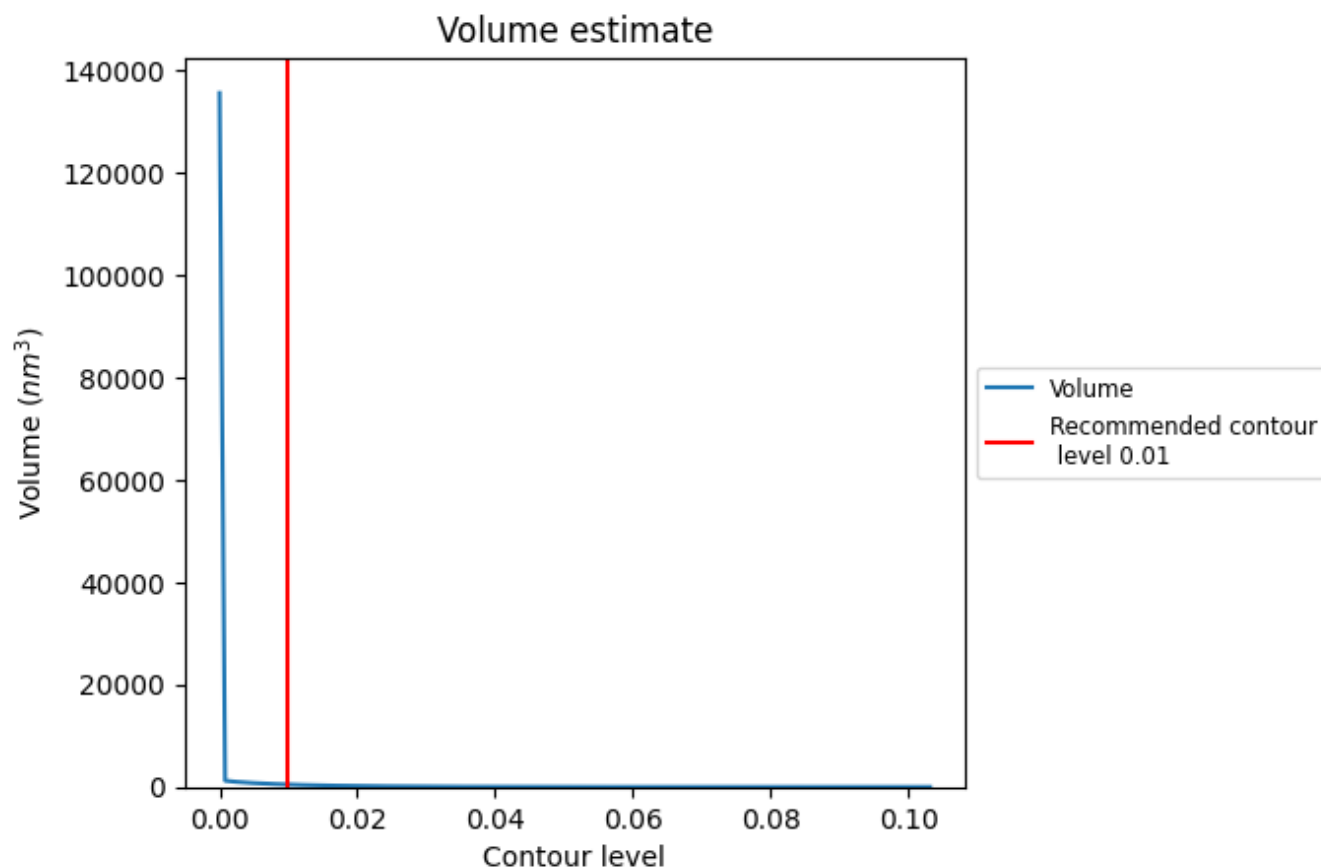
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

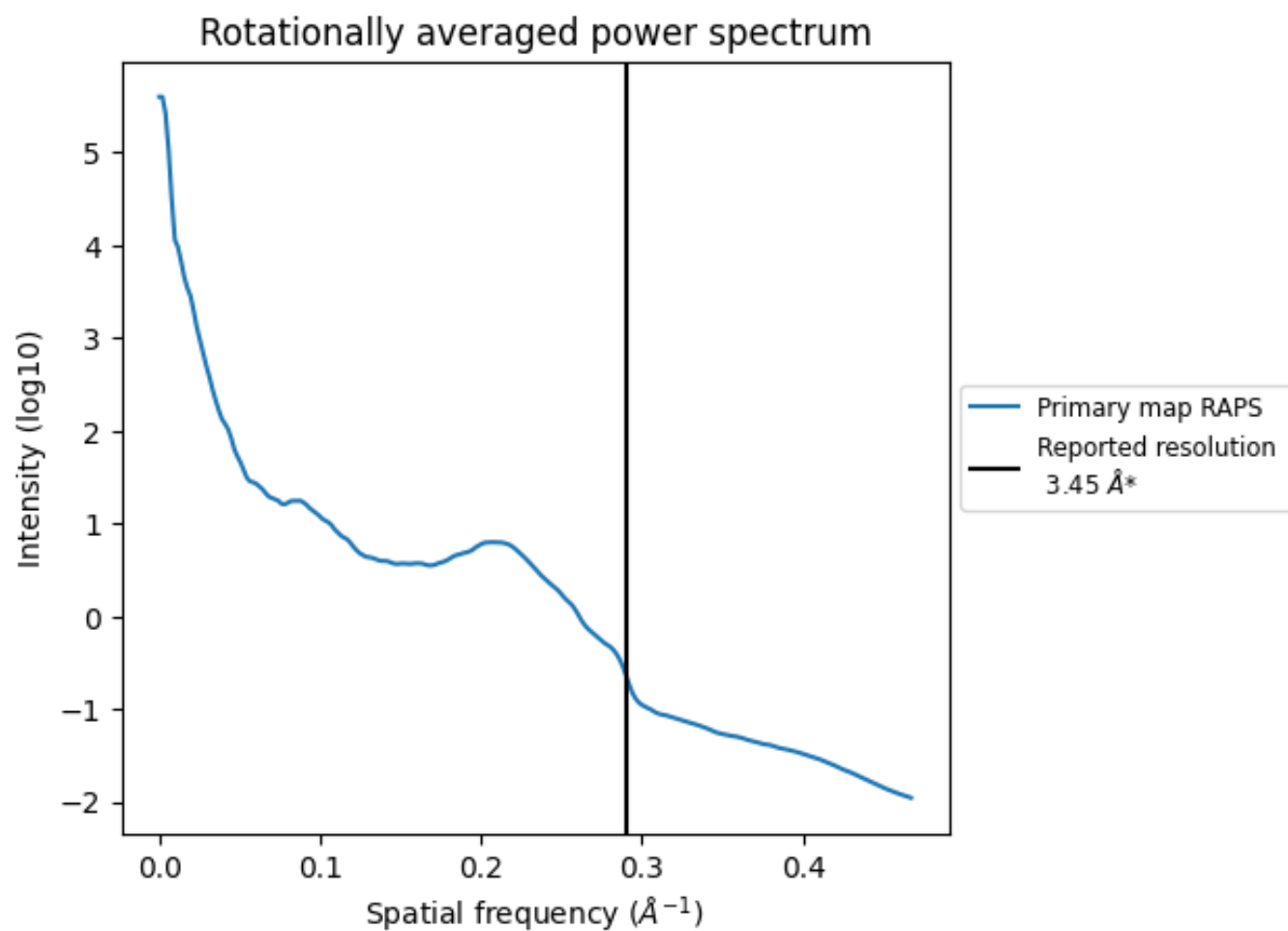
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 471 nm^3 ; this corresponds to an approximate mass of 425 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 Å⁻¹

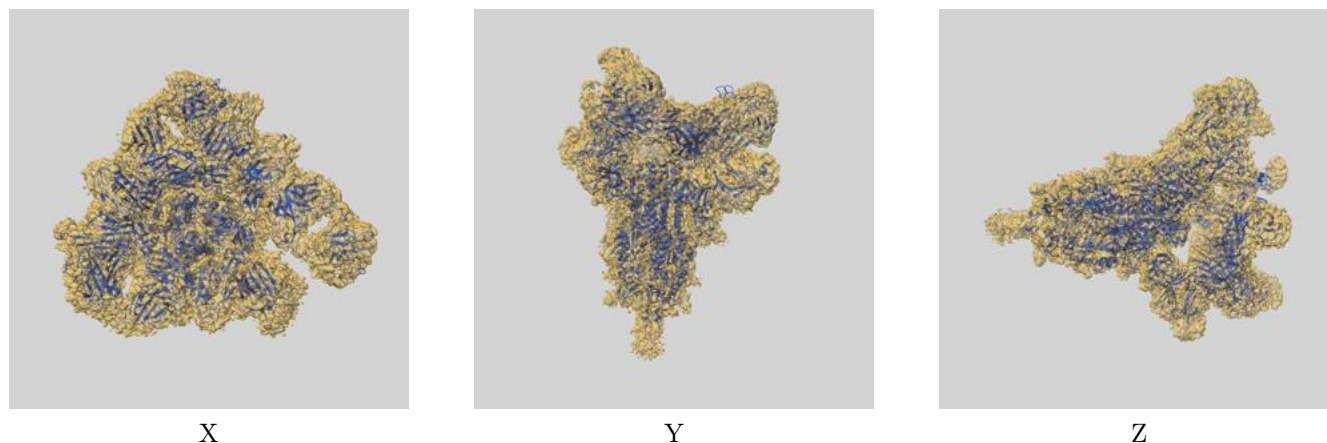
8 Fourier-Shell correlation ⓘ

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

9 Map-model fit [i](#)

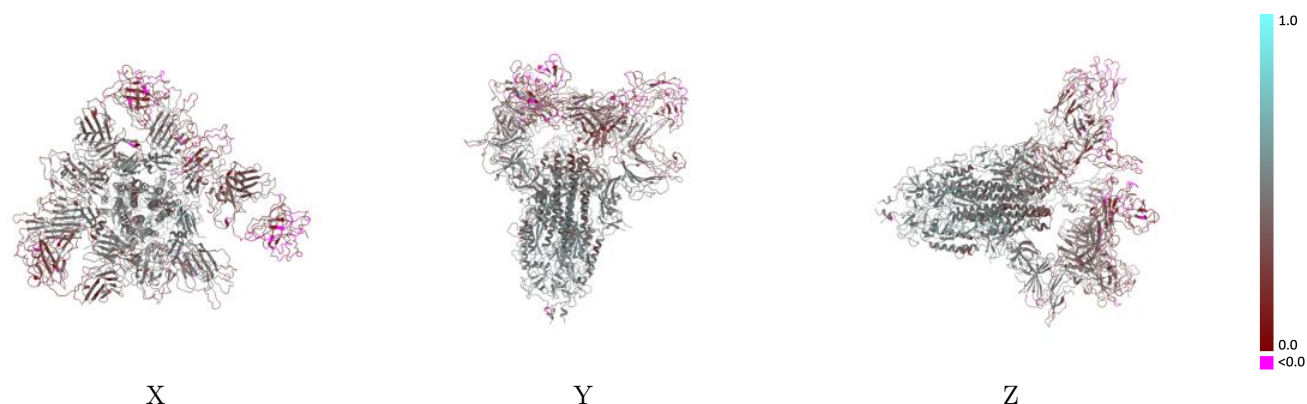
This section contains information regarding the fit between EMDB map EMD-32639 and PDB model 7WO5. Per-residue inclusion information can be found in section [3](#) on page [14](#).

9.1 Map-model overlay [i](#)



The images above show the 3D surface view of the map at the recommended contour level 0.01 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](#)



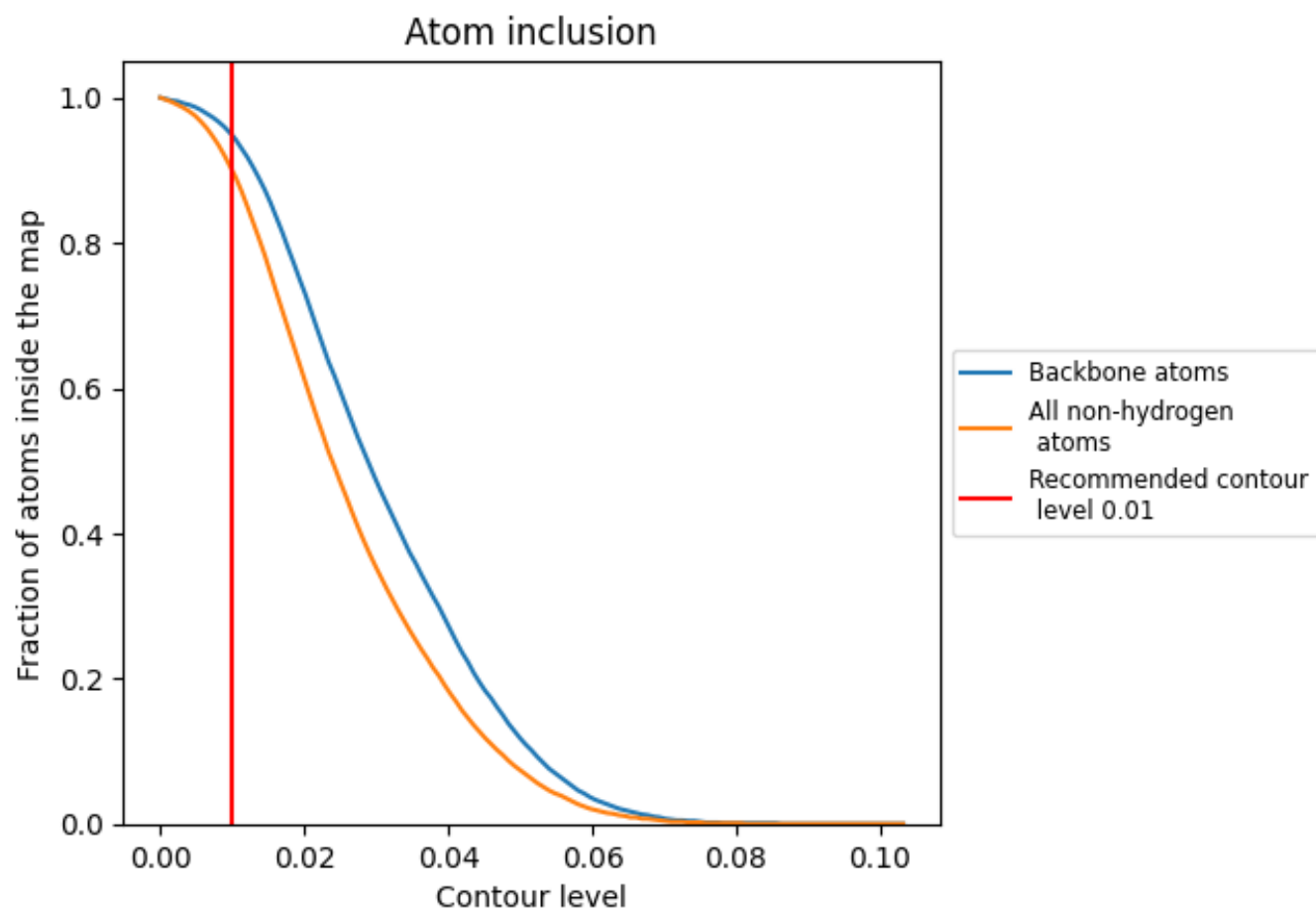
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.01).

9.4 Atom inclusion [i](#)



At the recommended contour level, 95% of all backbone atoms, 90% 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 (0.01) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8990	0.3950
A	0.9270	0.4390
B	0.9190	0.4460
C	0.9030	0.4200
D	0.8870	0.3210
E	0.8580	0.3200
F	0.8220	0.3000
G	0.8950	0.3000
H	0.8440	0.2700
I	0.8240	0.2370

1.0

0.0

<0.0