



## Full wwPDB EM Validation Report ⓘ

Dec 17, 2022 – 11:07 am GMT

PDB ID : 6Z6G  
EMDB ID : EMD-11093  
Title : Cryo-EM structure of La Crosse virus polymerase at pre-initiation stage  
Authors : Arragain, B.; Effantin, G.; Gerlach, P.; Reguera, J.; Schoehn, G.; Cusack, S.;  
Malet, H.  
Deposited on : 2020-05-28  
Resolution : 3.06 Å (reported)  
Based on initial model : 5AMQ

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

We welcome your comments at [validation@mail.wwpdb.org](mailto: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>.

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

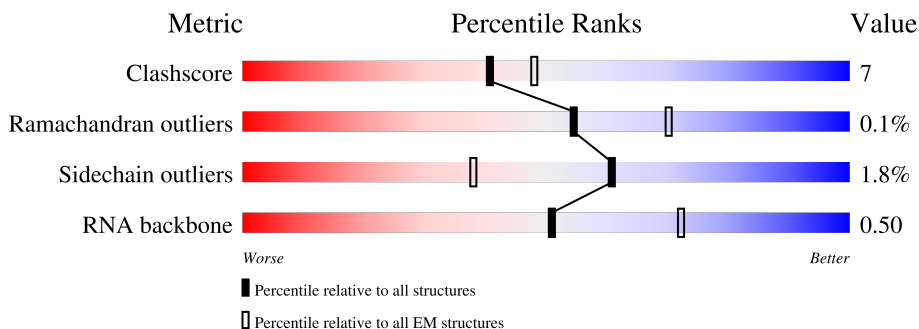
EMDB validation analysis : 0.0.1.dev43  
MolProbity : 4.02b-467  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
MapQ : 1.9.9  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.31.3

# 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 3.06 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	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

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  $\geq 3$ , 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	U	10	
2	X	8	
3	H	16	
4	A	2285	

## 2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 18068 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 RNA chain called 5'vRNA 1-10.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	U	10	216	96	39	71	10	0	0

- Molecule 2 is a RNA chain called 5'vRNA 9-16.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
2	X	5	101	47	18	32	4	0	0

- Molecule 3 is a RNA chain called 3'vRNA 1-16.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
3	H	13	274	123	47	91	13	0	0

- Molecule 4 is a protein called RNA-directed RNA polymerase L.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	A	2142	17475	11184	2924	3256	111	0	0

There are 22 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-21	MET	-	initiating methionine	UNP A5HC98
A	-20	GLY	-	expression tag	UNP A5HC98
A	-19	HIS	-	expression tag	UNP A5HC98
A	-18	HIS	-	expression tag	UNP A5HC98
A	-17	HIS	-	expression tag	UNP A5HC98
A	-16	HIS	-	expression tag	UNP A5HC98
A	-15	HIS	-	expression tag	UNP A5HC98
A	-14	HIS	-	expression tag	UNP A5HC98
A	-13	ASP	-	expression tag	UNP A5HC98

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Chain	Residue	Modelled	Actual	Comment	Reference
A	-12	TYR	-	expression tag	UNP A5HC98
A	-11	ASP	-	expression tag	UNP A5HC98
A	-10	ILE	-	expression tag	UNP A5HC98
A	-9	PRO	-	expression tag	UNP A5HC98
A	-8	THR	-	expression tag	UNP A5HC98
A	-7	THR	-	expression tag	UNP A5HC98
A	-6	GLU	-	expression tag	UNP A5HC98
A	-5	ASN	-	expression tag	UNP A5HC98
A	-4	LEU	-	expression tag	UNP A5HC98
A	-3	TYR	-	expression tag	UNP A5HC98
A	-2	PHE	-	expression tag	UNP A5HC98
A	-1	GLN	-	expression tag	UNP A5HC98
A	0	GLY	-	expression tag	UNP A5HC98

- Molecule 5 is ZINC ION (three-letter code: ZN) (formula: Zn) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms	AltConf
5	A	1	Total Zn 1 1	0

- Molecule 6 is MAGNESIUM ION (three-letter code: MG) (formula: Mg) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms	AltConf
6	A	1	Total Mg 1 1	0

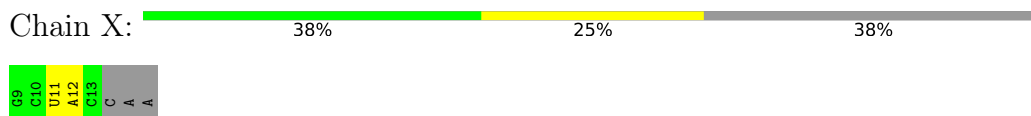
### 3 Residue-property plots

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.

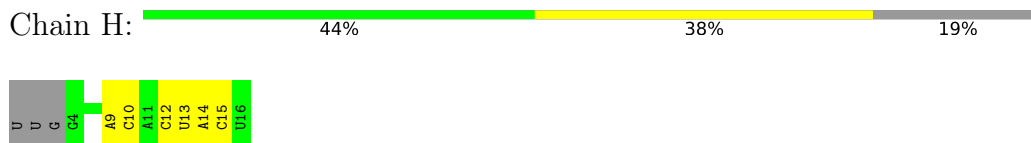
- Molecule 1: 5'vRNA 1-10



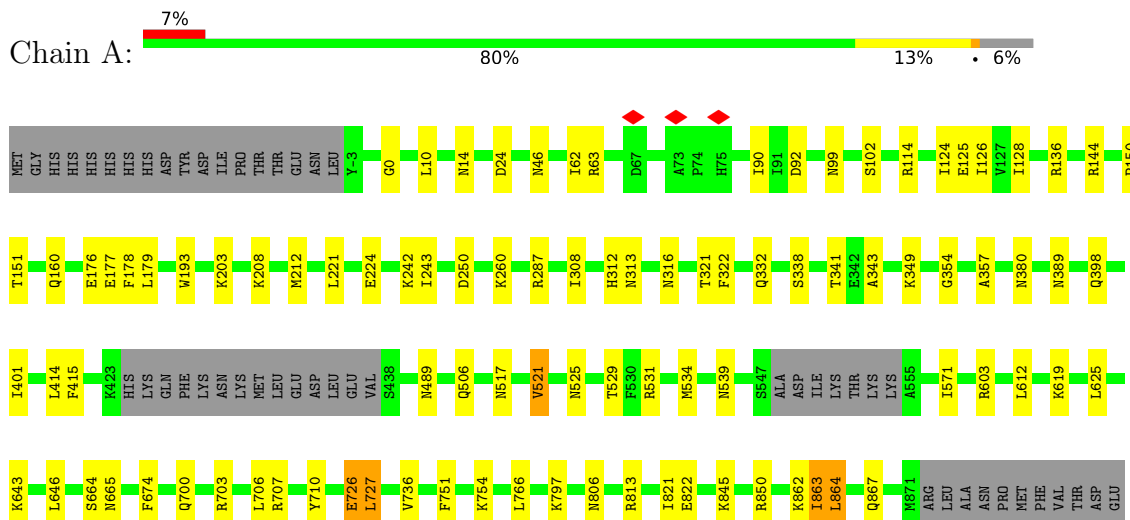
- Molecule 2: 5'vRNA 9-16



- Molecule 3: 3'vRNA 1-16



- Molecule 4: RNA-directed RNA polymerase L



L2250	M2251	L2251	ARG	L2251	ASP	E2159	W2160	S2161	D2165	K2166	Y2161	W2186	F2187	K2188	G2192	N2193	F2194	I2195	T2196	R2197	D2198	I2199	W2202	W2203	F2204	R2205	E2206	F2207	I2208	N2209	F2212	G2213	T2214	D2215	W2220	W2221	W2222	F2226	C2230	I2231	A2232	L2233	K2237	F2238	GLU	THR	GLN	ARG	ASP	PHE	S2245	E2246	F2247	T2248	K2249	
L1898	R1899	T1899	R1960	I1961	Y1962	N1963	E1964	I1965	T1966	P1967	V1968	C1969	V1970	N1971	N1972	V1973	A1974	E1975	D1979	Q1980	R1981	I1982	L1983	I1984	R1985	S1986	L1987	L1990	I1994	F1995	S1996	L1997	S1998	R1999	I2000	E2006	K2011	K2012	A2013	H2014	F2015	S2016	K2017	P2024	M2037	L2045	M2046	L2055	L2056	N2158	S2245	E2246	F2247	T2248	K2249	
I1898	R1901	K1902	L1903	L1904	G1905	S1906	H1908	G1909	L1910	K1911	F1912	E1913	N1914	M1915	S1916	K1917	I1918	Q1919	THR	TYR	PRO	GLY	N1924	Y1925	Y1926	I1927	T1928	Y1929	R1930	K1931	K1932	R1934	H1935	Q1936	F1937	V1938	Y1939	Q1940	I1941	H1942	S1943	H1944	E1945	S1946	I1947	T1948	R1949	R1950	N1951	E1952	E1953	H1954	M1955	A1956	I1957	R1958
Y1836	D1837	A1838	M1839	K1840	S1841	H1842	E1843	R1844	V1845	W1847	N1848	D1849	GLN	THR	ARG	HIS	LEU	ASP	MET	GLY	THR	I1861	N1862	L1863	T1864	I1865	T1866	G1867	Y1868	N1869	R1870	S1871	L1872	T1873	I1874	I1875	G1876	E1877	D1878	N1879	K1880	L1881	T1882	Y1883	A1884	E1885	L1886	T1889	R1890	P1893	E1894	N1895	I1896	T1897		
THR	GLU	HIS	K1705	I1710	S1715	L1724	L1729	Y1736	Q1743	L1744	S1746	G1747	A1751	Q1754	L1770	I1771	H1773	D1776	D1780	R1784	I1791	E1794	Y1806	R1815	T1816	I1819	P1820	R1824	T1825	G1826	D1827	L1828	R1829	Q1830	D1832	L1833	D1834	K1835	ALA	LEU	GLU	ALA	ASP	PRO	THR	GLU	M1645	V1650	K1653	I1659	N1672	E1684	S1701			
ALA	LEU	GLU	PRO	GLU	ASP	ILE	LEU	G1545	I1573	Y1574	S1575	N1580	T1590	S1594	P1599	M1603	W1615	LEU	LEU	ILE	ILE	HIS	HIS	S1622	L1625	R1628	D1636	ILE	GLN	GLY	ALA	ASP	PRO	THR	GLU	M1645	V1650	K1653	I1659	N1672	E1684	S1701														
GLN	VAL	CYS	LEU	TYR	GLU	GLY	HIS	CYS	R892	R897	P901	I907	L919	I933	H940	O952	K963	T964	E959	I960	F961	E964	A973	E980	R981	L984	N985	E988	N989	I990	S991	E992	L998	E1008	R1017	D1024	E1025	A1026	I1027	E1028	A1029	L1030														
A1031	THR	GLU	LYS	GLU	GLU	GLY	ASN	L1039	I1042	K1054	M1055	E1056	Q1067	K1072	D1080	N1112	M1133	L1144	V1155	G1123	R1424	C1158	I1171	I1178	H1185	S1186	Q1190	I1206	Q1223	M1226	K1236	P1289	I1298	D1328	L1357	L1360	I1027	E1028	A1029	L1030																
E1380	M1383	D1391	N1392	L1400	R1401	V1404	L1405	M1409	ASP	PRO	SER	ASP	ILE	GLY	GLU	THR	SER	ASP	MET	ARG	G1423	R1424	K1431	S1437	L1438	R1450	L1464	E1469	M1478	V1485	I1486	F1487	R1488	E1509	D1526	I1529	LEU	HIS	ASP	SER	ARG															

## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	57660	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 ( $e^-/\text{\AA}^2$ )	1.25	Depositor
Minimum defocus (nm)	-800	Depositor
Maximum defocus (nm)	-3500	Depositor
Magnification	165000	Depositor
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.089	Depositor
Minimum map value	-0.038	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.003	Depositor
Recommended contour level	0.01	Depositor
Map size (Å)	247.79999, 247.79999, 247.79999	wwPDB
Map dimensions	300, 300, 300	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.826, 0.826, 0.826	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: ZN, MG

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 5$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
1	U	0.95	0/241	1.26	5/374 (1.3%)
2	X	0.50	0/112	1.11	0/173
3	H	0.93	0/305	1.00	2/472 (0.4%)
4	A	0.47	0/17824	0.57	1/24023 (0.0%)
All	All	0.49	0/18482	0.60	8/25042 (0.0%)

There are no bond length outliers.

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	U	8	U	N3-C2-O2	-8.67	116.13	122.20
1	U	8	U	N1-C2-O2	8.36	128.65	122.80
1	U	8	U	C6-N1-C2	-6.24	117.25	121.00
3	H	12	C	N1-C2-O2	6.04	122.53	118.90
1	U	8	U	C5-C6-N1	5.96	125.68	122.70
1	U	8	U	C2-N1-C1'	5.85	124.72	117.70
3	H	12	C	N3-C2-O2	-5.64	117.95	121.90
4	A	1464	LEU	CB-CG-CD1	-5.15	102.24	111.00

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	U	216	0	108	0	0
2	X	101	0	53	2	0
3	H	274	0	140	1	0
4	A	17475	0	17524	266	0
5	A	1	0	0	0	0
6	A	1	0	0	0	0
All	All	18068	0	17825	268	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 7.

All (268) 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)
4:A:2151:LEU:HD13	4:A:2204:PHE:CE2	1.35	1.57
4:A:1838:ALA:HA	4:A:1868:TYR:CE1	1.47	1.50
4:A:2151:LEU:HD13	4:A:2204:PHE:CZ	1.50	1.46
4:A:2151:LEU:CD1	4:A:2204:PHE:CE2	1.99	1.44
4:A:1838:ALA:HA	4:A:1868:TYR:CZ	1.60	1.33
4:A:1829:ARG:O	4:A:1832:ASP:OD2	1.61	1.18
4:A:2151:LEU:CD2	4:A:2204:PHE:HE2	1.57	1.17
4:A:1829:ARG:HH11	4:A:1829:ARG:HB2	1.13	1.06
4:A:1838:ALA:CA	4:A:1868:TYR:CZ	2.40	1.05
4:A:1838:ALA:CA	4:A:1868:TYR:CE1	2.41	1.04
4:A:2151:LEU:CD2	4:A:2204:PHE:CE2	2.46	0.99
4:A:710:TYR:CD1	4:A:2099:TYR:HB2	1.97	0.98
4:A:2151:LEU:HD22	4:A:2204:PHE:CE2	1.99	0.97
4:A:1185:HIS:O	4:A:1186:SER:OG	1.87	0.92
4:A:1833:LEU:O	4:A:1836:TYR:HB3	1.71	0.91
4:A:710:TYR:CE1	4:A:2099:TYR:HB2	2.07	0.89
4:A:1838:ALA:HB1	4:A:1868:TYR:OH	1.72	0.89
4:A:1985:ARG:HG2	4:A:1985:ARG:HH11	1.36	0.89
4:A:1838:ALA:CB	4:A:1868:TYR:OH	2.22	0.88
4:A:2151:LEU:HD11	4:A:2204:PHE:CE2	2.10	0.85
4:A:2151:LEU:CG	4:A:2204:PHE:HE2	1.89	0.85
4:A:2084:PHE:HB3	4:A:2108:MET:CE	2.08	0.84
4:A:1983:LEU:HD12	4:A:1983:LEU:H	1.43	0.83
4:A:1743:GLN:NE2	4:A:1745:LEU:HB2	1.92	0.83
4:A:2151:LEU:CG	4:A:2204:PHE:CE2	2.62	0.82
4:A:1841:SER:O	4:A:1842:HIS:CD2	2.32	0.82
4:A:1837:ASP:O	4:A:1868:TYR:CD1	2.32	0.82
4:A:1838:ALA:CA	4:A:1868:TYR:OH	2.30	0.79

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:A:2151:LEU:CD1	4:A:2204:PHE:CZ	2.44	0.79
4:A:1743:GLN:HE22	4:A:1745:LEU:HB2	1.45	0.79
4:A:1838:ALA:O	4:A:1868:TYR:CE2	2.35	0.79
4:A:1829:ARG:C	4:A:1832:ASP:OD2	2.22	0.78
4:A:1829:ARG:HH11	4:A:1829:ARG:CB	1.96	0.77
4:A:1829:ARG:HB2	4:A:1829:ARG:NH1	1.98	0.77
4:A:1833:LEU:HG	4:A:1982:ILE:HG22	1.65	0.77
4:A:1842:HIS:HB2	4:A:2006:GLU:OE2	1.84	0.77
4:A:2084:PHE:CE1	4:A:2104:GLY:HA2	2.19	0.77
4:A:1833:LEU:HG	4:A:1982:ILE:CG2	2.15	0.77
4:A:1838:ALA:HA	4:A:1868:TYR:HE1	1.44	0.76
4:A:2084:PHE:HE1	4:A:2104:GLY:HA2	1.51	0.75
4:A:710:TYR:HD1	4:A:2099:TYR:HB2	1.50	0.75
4:A:710:TYR:CE1	4:A:2099:TYR:CB	2.70	0.74
4:A:1838:ALA:HA	4:A:1868:TYR:OH	1.84	0.74
4:A:2084:PHE:HB3	4:A:2108:MET:HE1	1.70	0.74
4:A:177:GLU:OE2	4:A:1954:HIS:CE1	2.41	0.74
4:A:1983:LEU:HD12	4:A:1983:LEU:N	2.02	0.74
4:A:176:GLU:HB2	4:A:1958:ARG:NH2	2.04	0.71
4:A:1838:ALA:O	4:A:1868:TYR:CZ	2.43	0.71
4:A:1832:ASP:OD2	4:A:1832:ASP:N	2.24	0.69
4:A:2152:ILE:HG22	4:A:2153:LYS:N	2.08	0.69
4:A:338:SER:HG	4:A:341:THR:HG1	1.38	0.68
4:A:1017:ARG:NE	4:A:2088:GLU:OE2	2.26	0.68
4:A:176:GLU:HB2	4:A:1958:ARG:HH22	1.59	0.67
4:A:1841:SER:O	4:A:1842:HIS:CG	2.47	0.67
4:A:1791:ILE:HD11	4:A:2037:MET:HE3	1.76	0.67
4:A:2103:ARG:O	4:A:2103:ARG:HG3	1.94	0.67
4:A:1828:LEU:HD21	4:A:1833:LEU:HD22	1.78	0.66
4:A:1830:GLN:O	4:A:1830:GLN:NE2	2.30	0.65
4:A:1030:LEU:HD12	4:A:1042:ILE:HG13	1.78	0.64
4:A:1927:ILE:HG23	4:A:1968:VAL:HG23	1.79	0.64
4:A:1983:LEU:H	4:A:1983:LEU:CD1	2.11	0.64
4:A:1833:LEU:HD21	4:A:1987:LEU:HD11	1.80	0.63
4:A:312:HIS:HD2	4:A:506:GLN:HE22	1.45	0.63
4:A:1833:LEU:HD23	4:A:1984:ILE:CD1	2.28	0.63
4:A:710:TYR:HE1	4:A:2099:TYR:CB	2.12	0.63
4:A:2151:LEU:CD1	4:A:2204:PHE:HE2	1.71	0.63
4:A:1837:ASP:O	4:A:1868:TYR:CE1	2.52	0.62
4:A:707:ARG:NH1	4:A:1603:MET:O	2.33	0.62
4:A:517:ASN:ND2	4:A:534:MET:O	2.32	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:A:1985:ARG:HG2	4:A:1985:ARG:NH1	2.08	0.61
4:A:1328:ASP:HB3	4:A:1392:ASN:HD21	1.65	0.61
4:A:1784:ARG:NH2	4:A:1995:PHE:O	2.34	0.60
4:A:1824:ARG:HH21	4:A:1996:SER:H	1.50	0.60
4:A:813:ARG:NH2	4:A:984:LEU:O	2.33	0.59
4:A:710:TYR:HE1	4:A:2099:TYR:CG	2.20	0.59
4:A:114:ARG:HH22	4:A:124:ILE:H	1.50	0.59
4:A:2046:ASN:HA	4:A:2083:ASN:O	2.03	0.58
4:A:2062:ILE:HG23	4:A:2166:LYS:HD2	1.85	0.58
4:A:521:VAL:HG22	4:A:531:ARG:HE	1.68	0.58
4:A:2055:LEU:HB2	4:A:2121:GLU:HB3	1.86	0.58
4:A:102:SER:HB2	4:A:128:ILE:HD13	1.86	0.58
4:A:1791:ILE:HD11	4:A:2037:MET:CE	2.33	0.58
4:A:703:ARG:HD2	4:A:726:GLU:HB3	1.85	0.57
4:A:981:ARG:NH1	4:A:1080:ASP:OD1	2.36	0.57
4:A:1380:GLU:OE1	4:A:1383:ASN:ND2	2.37	0.57
4:A:1469:GLU:HG3	4:A:1628:ARG:HG2	1.86	0.57
4:A:1828:LEU:HD21	4:A:1833:LEU:CD2	2.35	0.57
4:A:2084:PHE:CB	4:A:2108:MET:CE	2.83	0.57
4:A:221:LEU:HD13	4:A:243:ILE:HG23	1.88	0.56
4:A:1838:ALA:C	4:A:1868:TYR:CZ	2.78	0.56
4:A:2148:VAL:O	4:A:2152:ILE:HD12	2.06	0.56
4:A:1986:SER:O	4:A:1990:LEU:HD12	2.05	0.55
4:A:1815:ARG:NH1	4:A:1827:ASP:O	2.40	0.55
4:A:1575:SER:O	4:A:1580:ASN:ND2	2.40	0.54
4:A:1830:GLN:HA	4:A:1984:ILE:HG12	1.89	0.54
4:A:2152:ILE:HG13	4:A:2161:SER:OG	2.06	0.54
4:A:136:ARG:O	4:A:1615:ASN:ND2	2.39	0.54
4:A:2015:PHE:CE2	4:A:2045:LEU:HD11	2.41	0.54
4:A:2084:PHE:CD1	4:A:2108:MET:HE1	2.42	0.54
4:A:2147:ALA:O	4:A:2151:LEU:HB2	2.08	0.54
4:A:2152:ILE:CG1	4:A:2161:SER:OG	2.56	0.54
4:A:2084:PHE:CD1	4:A:2108:MET:CE	2.91	0.54
4:A:62:ILE:HD12	4:A:63:ARG:HG2	1.90	0.54
4:A:250:ASP:OD2	4:A:797:LYS:NZ	2.30	0.54
4:A:1879:ASN:O	4:A:1914:ASN:ND2	2.41	0.54
4:A:864:LEU:O	4:A:867:GLN:HG3	2.08	0.54
4:A:2084:PHE:CB	4:A:2108:MET:HE3	2.38	0.54
4:A:92:ASP:HB3	4:A:128:ILE:HG22	1.88	0.54
4:A:2150:SER:O	4:A:2154:LEU:HB2	2.07	0.53
4:A:2120:ARG:NH1	4:A:2121:GLU:OE2	2.41	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:A:1401:ARG:HB2	4:A:1573:ILE:HD11	1.91	0.53
4:A:603:ARG:NH1	4:A:751:PHE:O	2.42	0.53
4:A:706:LEU:HD11	4:A:2094:PRO:HB2	1.91	0.53
4:A:2087:GLY:HA2	4:A:2098:ILE:O	2.09	0.53
4:A:2151:LEU:CD2	4:A:2208:ILE:HD11	2.39	0.53
4:A:177:GLU:OE1	4:A:1954:HIS:CE1	2.61	0.53
4:A:2151:LEU:HD22	4:A:2208:ILE:HD11	1.89	0.53
4:A:2152:ILE:C	4:A:2154:LEU:H	2.12	0.53
4:A:2152:ILE:O	4:A:2154:LEU:N	2.41	0.53
4:A:2155:LEU:HD13	4:A:2233:LEU:HD23	1.90	0.52
4:A:1590:THR:O	4:A:1594:SER:OG	2.26	0.52
4:A:850:ARG:HD3	4:A:897:ARG:HH21	1.74	0.52
4:A:665:ASN:HD22	4:A:1226:MET:HB3	1.74	0.52
4:A:1008:GLU:OE1	4:A:1054:LYS:NZ	2.42	0.52
4:A:1773:HIS:NE2	4:A:2011:LYS:O	2.42	0.52
4:A:727:LEU:N	4:A:727:LEU:CD2	2.73	0.52
4:A:525:ASN:OD1	4:A:529:THR:OG1	2.27	0.52
4:A:952:GLN:NE2	4:A:954:THR:OG1	2.43	0.51
4:A:1404:VAL:O	4:A:1424:ARG:NH1	2.43	0.51
4:A:2165:ASP:OD1	4:A:2181:TYR:OH	2.27	0.51
3:H:13:U:H5''	3:H:14:A:H5'	1.93	0.51
4:A:2064:CYS:SG	4:A:2067:SER:N	2.81	0.51
4:A:2146:GLU:O	4:A:2150:SER:HB2	2.10	0.51
4:A:2154:LEU:HD11	4:A:2199:ILE:HD13	1.92	0.51
4:A:919:LEU:HD13	4:A:1478:MET:HG3	1.93	0.51
4:A:1833:LEU:HG	4:A:1982:ILE:HG21	1.90	0.51
4:A:1485:VAL:HG23	4:A:1488:ARG:HH21	1.76	0.51
4:A:1834:ASP:C	4:A:1836:TYR:N	2.61	0.51
4:A:1985:ARG:NH1	4:A:1985:ARG:CG	2.73	0.50
4:A:224:GLU:OE2	4:A:242:LYS:NZ	2.42	0.50
4:A:1437:SER:OG	4:A:1438:LEU:N	2.44	0.50
4:A:1912:PHE:HB3	4:A:1968:VAL:HG21	1.94	0.50
4:A:316:ASN:HB3	4:A:322:PHE:HE2	1.77	0.50
4:A:1400:LEU:HD22	4:A:1573:ILE:HG23	1.93	0.50
4:A:1715:SER:HB3	4:A:1724:LEU:HD12	1.94	0.50
4:A:2151:LEU:HB2	4:A:2204:PHE:HZ	1.77	0.49
4:A:354:GLY:HA3	4:A:389:ASN:HD22	1.77	0.49
4:A:1834:ASP:C	4:A:1836:TYR:H	2.15	0.49
4:A:2193:ASN:HB2	4:A:2196:THR:HB	1.94	0.49
4:A:1599:PRO:HB3	4:A:1736:TYR:HE1	1.78	0.49
4:A:177:GLU:OE1	4:A:1954:HIS:HE1	1.95	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:A:177:GLU:CD	4:A:1954:HIS:CE1	2.86	0.48
4:A:1026:ALA:O	4:A:1030:LEU:HG	2.13	0.48
4:A:619:LYS:NZ	4:A:625:LEU:O	2.47	0.48
4:A:1918:ILE:HG22	4:A:1944:HIS:HD2	1.79	0.48
4:A:2118:ILE:O	4:A:2122:THR:CB	2.62	0.48
4:A:332:GLN:HE21	4:A:349:LYS:HA	1.76	0.48
4:A:1450:ARG:HD3	4:A:1486:ILE:HG21	1.95	0.48
4:A:1829:ARG:H	4:A:1832:ASP:CG	2.17	0.48
4:A:1837:ASP:HB3	4:A:1982:ILE:HD12	1.95	0.48
4:A:2118:ILE:O	4:A:2122:THR:OG1	2.26	0.48
4:A:2160:TRP:HD1	4:A:2222:MET:HG3	1.78	0.48
4:A:150:PRO:HD2	4:A:1754:GLN:HE22	1.79	0.48
4:A:1930:ARG:HG2	4:A:1938:VAL:HG12	1.96	0.48
4:A:90:ILE:HB	4:A:126:ILE:HG22	1.95	0.48
4:A:99:ASN:O	4:A:102:SER:OG	2.31	0.48
4:A:150:PRO:HG2	4:A:1751:ALA:HB2	1.96	0.47
4:A:1743:GLN:HE21	4:A:1745:LEU:H	1.62	0.47
4:A:1834:ASP:O	4:A:1836:TYR:N	2.48	0.47
4:A:1926:TYR:HE1	4:A:1970:VAL:HG22	1.79	0.47
4:A:401:ILE:HD13	4:A:415:PHE:HZ	1.80	0.47
4:A:1056:GLU:HG2	4:A:1236:LYS:HG2	1.96	0.47
4:A:1876:GLY:HA3	4:A:1881:LEU:HA	1.96	0.47
4:A:1650:VAL:HA	4:A:1653:LYS:HG2	1.96	0.47
4:A:24:ASP:CG	4:A:1901:ARG:NH2	2.67	0.47
4:A:2015:PHE:HE2	4:A:2045:LEU:HD11	1.79	0.47
4:A:176:GLU:OE1	4:A:1958:ARG:NH1	2.48	0.47
4:A:1017:ARG:CZ	4:A:2088:GLU:OE2	2.63	0.47
4:A:2084:PHE:HD1	4:A:2108:MET:HE1	1.79	0.47
4:A:0:GLY:H	4:A:160:GLN:HE22	1.61	0.46
4:A:961:PHE:CD2	4:A:1144:LEU:HB3	2.50	0.46
4:A:2152:ILE:HD11	4:A:2226:PHE:CZ	2.50	0.46
4:A:308:ILE:HD12	4:A:571:ILE:HD11	1.96	0.46
4:A:1833:LEU:HD13	4:A:1833:LEU:HA	1.72	0.46
4:A:1865:ILE:HB	4:A:1872:ILE:HG22	1.97	0.46
4:A:2083:ASN:HA	4:A:2102:LYS:O	2.15	0.46
4:A:1171:ILE:HG13	4:A:1178:ILE:HD12	1.97	0.46
4:A:517:ASN:O	4:A:521:VAL:HB	2.15	0.46
4:A:1780:ASP:CA	4:A:2077:LEU:O	2.64	0.46
4:A:2136:PHE:HA	4:A:2141:ASN:HD22	1.80	0.45
4:A:940:HIS:NE2	4:A:964:GLU:OE2	2.41	0.45
4:A:2151:LEU:HD21	4:A:2204:PHE:HE2	1.66	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:A:1824:ARG:NH2	4:A:1994:ILE:O	2.49	0.45
4:A:2158:ASN:HD21	4:A:2160:TRP:HE3	1.64	0.45
4:A:1072:LYS:HD2	4:A:1155:VAL:HG11	1.98	0.45
4:A:1780:ASP:HA	4:A:2077:LEU:O	2.17	0.45
4:A:1770:LEU:HD21	4:A:2014:HIS:O	2.16	0.45
4:A:178:PHE:HD2	4:A:179:LEU:HD12	1.82	0.45
4:A:845:LYS:HB2	4:A:907:ILE:HG22	1.98	0.45
4:A:151:THR:HG21	4:A:1747:GLY:HA3	1.99	0.45
4:A:998:LEU:HD21	4:A:1710:ILE:HD11	1.98	0.45
4:A:1289:PRO:HG3	4:A:1729:LEU:HA	1.98	0.45
4:A:343:ALA:HB1	4:A:414:LEU:HD22	1.99	0.45
4:A:612:LEU:HD23	4:A:1298:ILE:HD11	1.98	0.45
4:A:988:GLU:HG3	4:A:990:ILE:HG12	1.97	0.45
4:A:1369:GLN:H	4:A:1369:GLN:HG2	1.57	0.45
4:A:664:SER:OG	4:A:665:ASN:N	2.50	0.44
4:A:2088:GLU:O	4:A:2088:GLU:HG3	2.16	0.44
4:A:2152:ILE:C	4:A:2154:LEU:N	2.70	0.44
4:A:2014:HIS:CE1	4:A:2016:SER:OG	2.70	0.44
4:A:1391:ASP:OD1	4:A:1391:ASP:N	2.51	0.44
4:A:1830:GLN:N	4:A:1984:ILE:HG12	2.33	0.44
4:A:700:GLN:HB3	4:A:703:ARG:HH21	1.83	0.44
4:A:1881:LEU:HB2	4:A:1969:CYS:HB2	2.00	0.44
4:A:821:ILE:HG12	4:A:980:GLU:HB2	2.00	0.44
4:A:933:ILE:HG21	4:A:973:ALA:HB2	1.99	0.44
4:A:2084:PHE:O	4:A:2084:PHE:CD2	2.70	0.44
4:A:1776:ASP:OD2	4:A:1998:SER:OG	2.27	0.43
4:A:1794:GLU:HG3	4:A:2024:PRO:HG3	2.00	0.43
4:A:1771:ILE:HD13	4:A:1771:ILE:HA	1.82	0.43
4:A:398:GLN:OE1	4:A:531:ARG:NH1	2.51	0.43
4:A:1669:ILE:HD12	4:A:1684:GLU:HG2	1.99	0.43
4:A:1830:GLN:CA	4:A:1984:ILE:HG12	2.49	0.43
4:A:985:ASN:HB3	4:A:988:GLU:HB3	2.01	0.43
4:A:1806:TYR:OH	4:A:1825:THR:OG1	2.26	0.43
4:A:2081:PRO:HG3	4:A:2106:ARG:HH21	1.84	0.43
4:A:313:ASN:HB2	4:A:539:ASN:HD21	1.84	0.43
4:A:1357:LEU:HD23	4:A:1360:LEU:HD12	2.00	0.43
4:A:10:LEU:O	4:A:14:ASN:ND2	2.51	0.43
4:A:1431:LYS:NZ	4:A:1509:GLU:OE1	2.44	0.43
4:A:754:LYS:HE2	4:A:953:LYS:HE3	2.01	0.42
4:A:766:LEU:HD13	4:A:959:GLU:HB3	2.01	0.42
4:A:125:GLU:HG2	4:A:144:ARG:HB3	2.01	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:A:1839:MET:SD	4:A:1839:MET:C	2.97	0.42
4:A:1833:LEU:O	4:A:1836:TYR:CB	2.56	0.42
4:A:863:ILE:HG22	4:A:864:LEU:N	2.35	0.42
4:A:806:ASN:ND2	4:A:1158:CYS:SG	2.92	0.42
4:A:312:HIS:CD2	4:A:506:GLN:HE22	2.32	0.42
4:A:1830:GLN:NE2	4:A:1830:GLN:C	2.73	0.42
4:A:643:LYS:HD2	4:A:646:LEU:HD22	2.02	0.42
4:A:2245:SER:OG	4:A:2246:GLU:N	2.49	0.42
4:A:150:PRO:HD2	4:A:1754:GLN:NE2	2.35	0.41
4:A:203:LYS:HA	4:A:208:LYS:HE3	2.01	0.41
4:A:1526:ASP:HA	4:A:1529:ILE:HG22	2.01	0.41
4:A:193:TRP:NE1	4:A:822:GLU:OE2	2.43	0.41
4:A:1829:ARG:CB	4:A:1829:ARG:NH1	2.73	0.41
4:A:2084:PHE:CG	4:A:2108:MET:HE3	2.55	0.41
4:A:2215:ASP:O	4:A:2220:ASN:ND2	2.53	0.41
4:A:287:ARG:NH2	4:A:674:PHE:O	2.40	0.41
4:A:1816:THR:HG21	4:A:1835:LYS:HG2	2.03	0.41
4:A:1820:PRO:HB3	4:A:2000:ILE:HG23	2.02	0.41
4:A:2136:PHE:HA	4:A:2141:ASN:ND2	2.35	0.41
4:A:863:ILE:CG2	4:A:864:LEU:N	2.81	0.41
4:A:321:THR:HG21	4:A:357:ALA:HB1	2.02	0.41
4:A:1067:GLN:OE1	4:A:1223:GLN:NE2	2.54	0.41
2:X:11:U:H2'	2:X:12:A:C8	2.55	0.41
4:A:521:VAL:HG22	4:A:531:ARG:NE	2.32	0.41
4:A:901:PRO:HD2	4:A:1133:ASN:HD22	1.86	0.41
4:A:1770:LEU:HD11	4:A:2017:LYS:HB2	2.03	0.41
4:A:2107:HIS:O	4:A:2112:ASN:ND2	2.49	0.41
4:A:260:LYS:HE2	4:A:260:LYS:HB3	1.90	0.40
4:A:1928:THR:HG22	4:A:1967:PRO:HB3	2.03	0.40
4:A:1055:MET:HE2	4:A:1206:ILE:HG12	2.03	0.40
4:A:1931:LYS:HE2	4:A:1931:LYS:HB2	1.94	0.40
2:X:11:U:O2	4:A:380:ASN:ND2	2.44	0.40
4:A:1819:ILE:HG22	4:A:2000:ILE:HD11	2.03	0.40
4:A:1839:MET:SD	4:A:1839:MET:O	2.79	0.40
4:A:2012:LYS:HE3	4:A:2012:LYS:HB2	1.25	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
4	A	2116/2285 (93%)	1974 (93%)	139 (7%)	3 (0%)	51 81

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
4	A	2153	LYS
4	A	1186	SER
4	A	1969	CYS

### 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
4	A	1968/2107 (93%)	1932 (98%)	36 (2%)	59 80

All (36) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
4	A	46	ASN
4	A	212	MET
4	A	489	ASN
4	A	521	VAL
4	A	726	GLU
4	A	727	LEU
4	A	736	VAL
4	A	862	LYS

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
4	A	863	ILE
4	A	864	LEU
4	A	1030	LEU
4	A	1112	ASN
4	A	1133	ASN
4	A	1190	GLN
4	A	1405	LEU
4	A	1424	ARG
4	A	1672	ASN
4	A	1743	GLN
4	A	1829	ARG
4	A	1830	GLN
4	A	1832	ASP
4	A	1833	LEU
4	A	1834	ASP
4	A	1839	MET
4	A	1840	LYS
4	A	1958	ARG
4	A	1983	LEU
4	A	1984	ILE
4	A	1985	ARG
4	A	2011	LYS
4	A	2012	LYS
4	A	2071	ASN
4	A	2103	ARG
4	A	2150	SER
4	A	2152	ILE
4	A	2209	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (31) such sidechains are listed below:

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
4	A	14	ASN
4	A	46	ASN
4	A	160	GLN
4	A	312	HIS
4	A	332	GLN
4	A	389	ASN
4	A	489	ASN
4	A	565	HIS
4	A	602	GLN
4	A	806	ASN

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Mol	Chain	Res	Type
4	A	826	ASN
4	A	952	GLN
4	A	1058	ASN
4	A	1112	ASN
4	A	1133	ASN
4	A	1190	GLN
4	A	1243	ASN
4	A	1392	ASN
4	A	1580	ASN
4	A	1672	ASN
4	A	1726	GLN
4	A	1743	GLN
4	A	1754	GLN
4	A	1830	GLN
4	A	1842	HIS
4	A	1924	ASN
4	A	1944	HIS
4	A	1954	HIS
4	A	2071	ASN
4	A	2141	ASN
4	A	2209	ASN

### 5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	U	9/10 (90%)	4 (44%)	0
2	X	4/8 (50%)	0	0
3	H	12/16 (75%)	3 (25%)	0
All	All	25/34 (73%)	7 (28%)	0

All (7) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	U	6	U
1	U	7	G
1	U	8	U
1	U	9	G
3	H	9	A
3	H	10	C
3	H	15	C

There are no RNA pucker outliers to report.

#### 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 monosaccharides in this entry.

#### 5.6 Ligand geometry [i](#)

Of 2 ligands modelled in this entry, 2 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

#### 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.

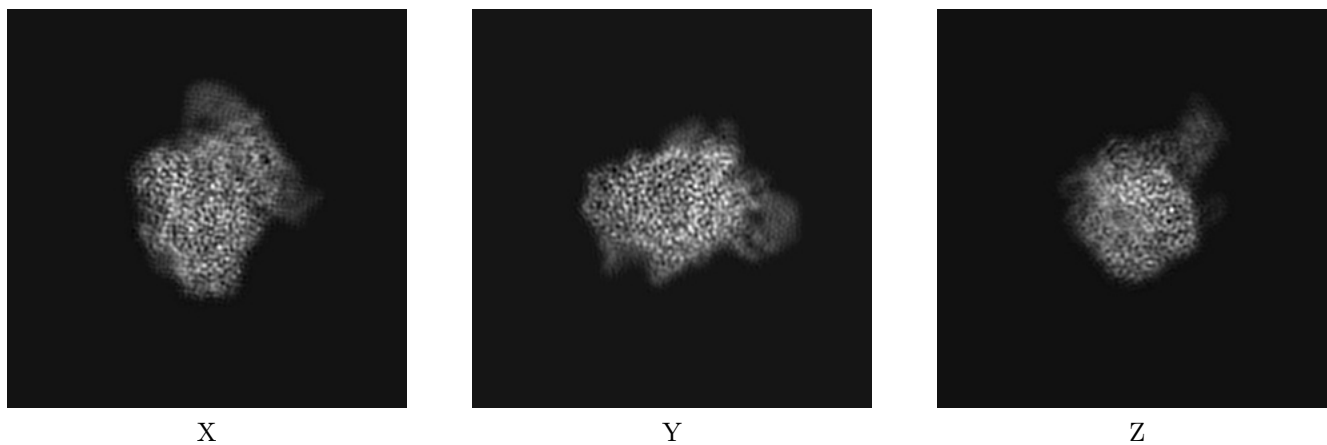
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-11093. 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](#)

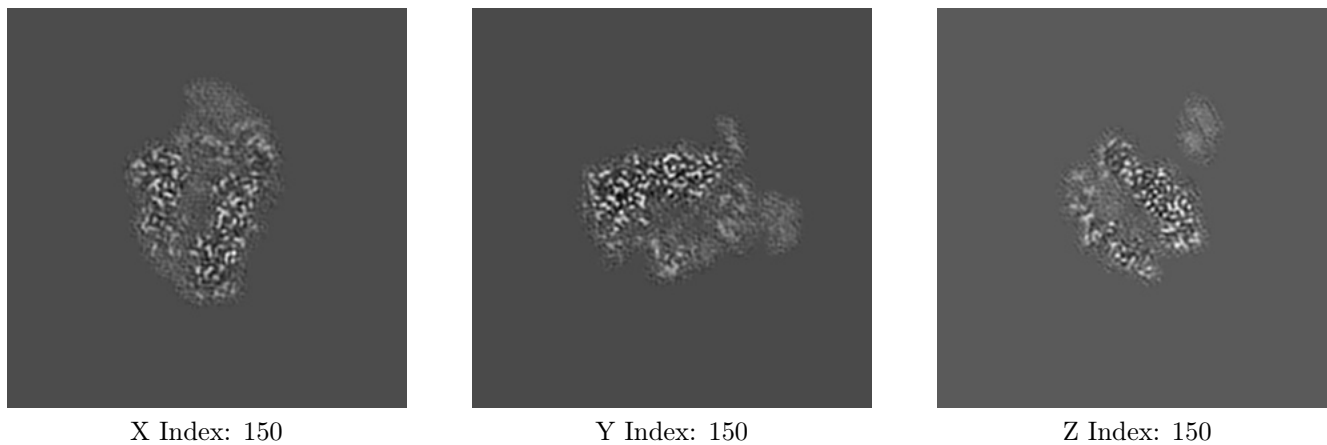
#### 6.1.1 Primary map



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

### 6.2 Central slices [i](#)

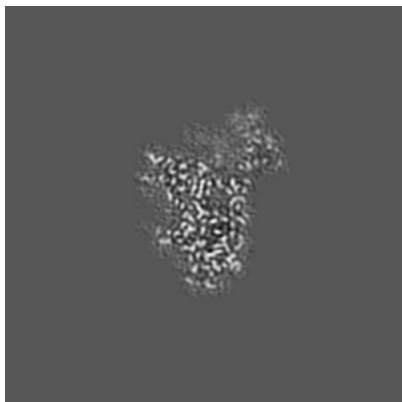
#### 6.2.1 Primary map



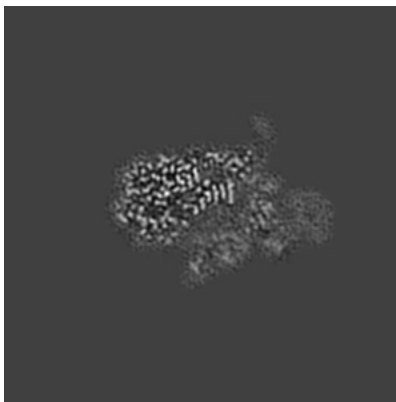
The images above show central slices of the map in three orthogonal directions.

## 6.3 Largest variance slices [i](#)

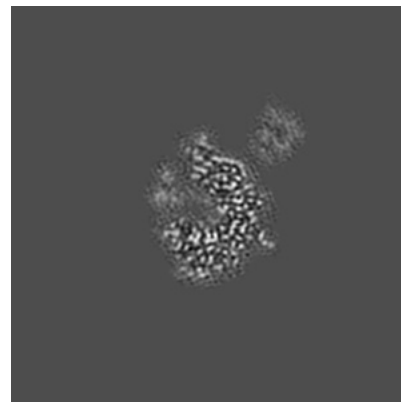
### 6.3.1 Primary map



X Index: 170



Y Index: 158



Z Index: 167

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

## 6.4 Orthogonal surface views [i](#)

### 6.4.1 Primary map



X



Y



Z

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.

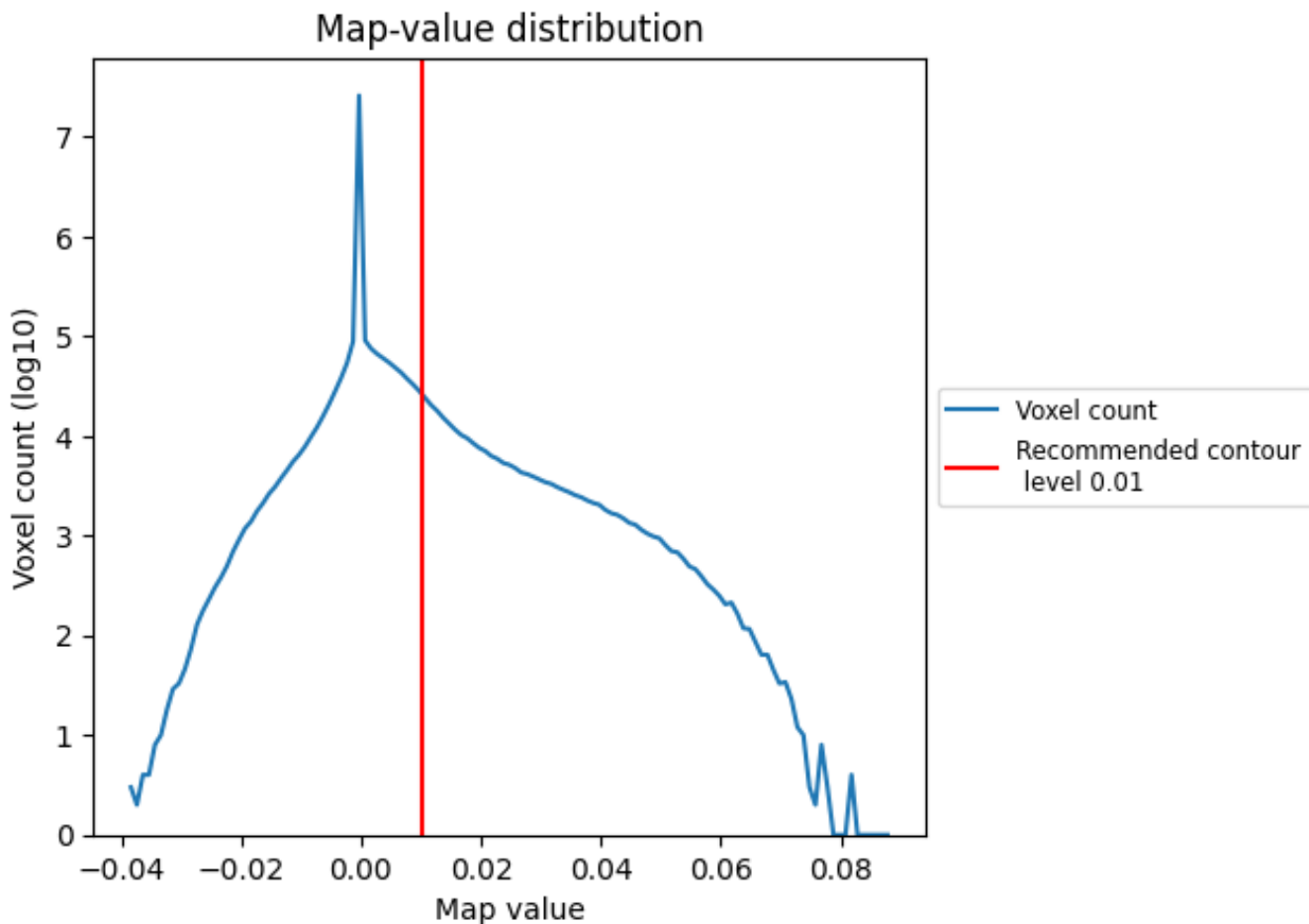
## 6.5 Mask visualisation

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

## 7 Map analysis [i](#)

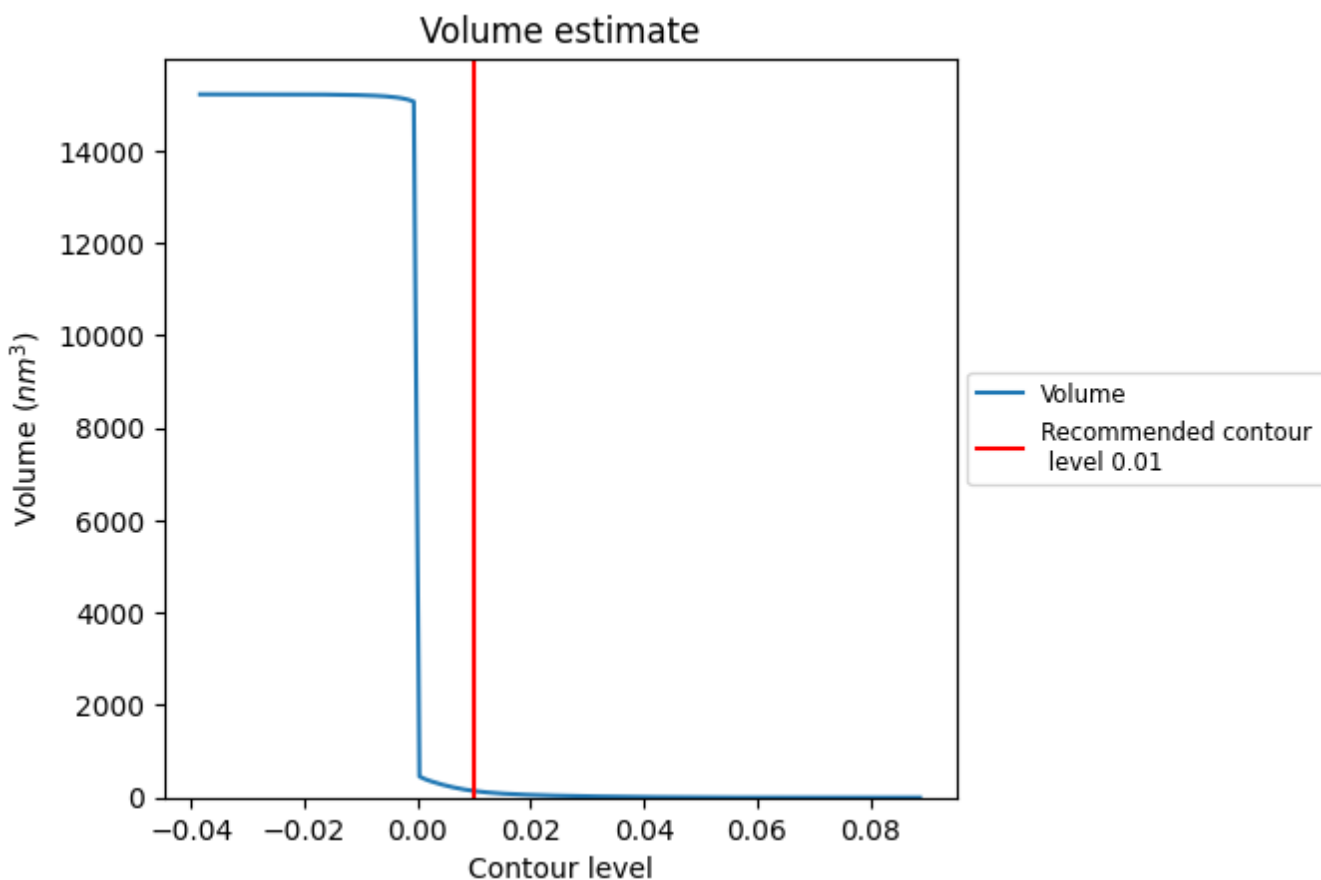
This section contains the results of statistical analysis of the map.

### 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 [\(i\)](#)

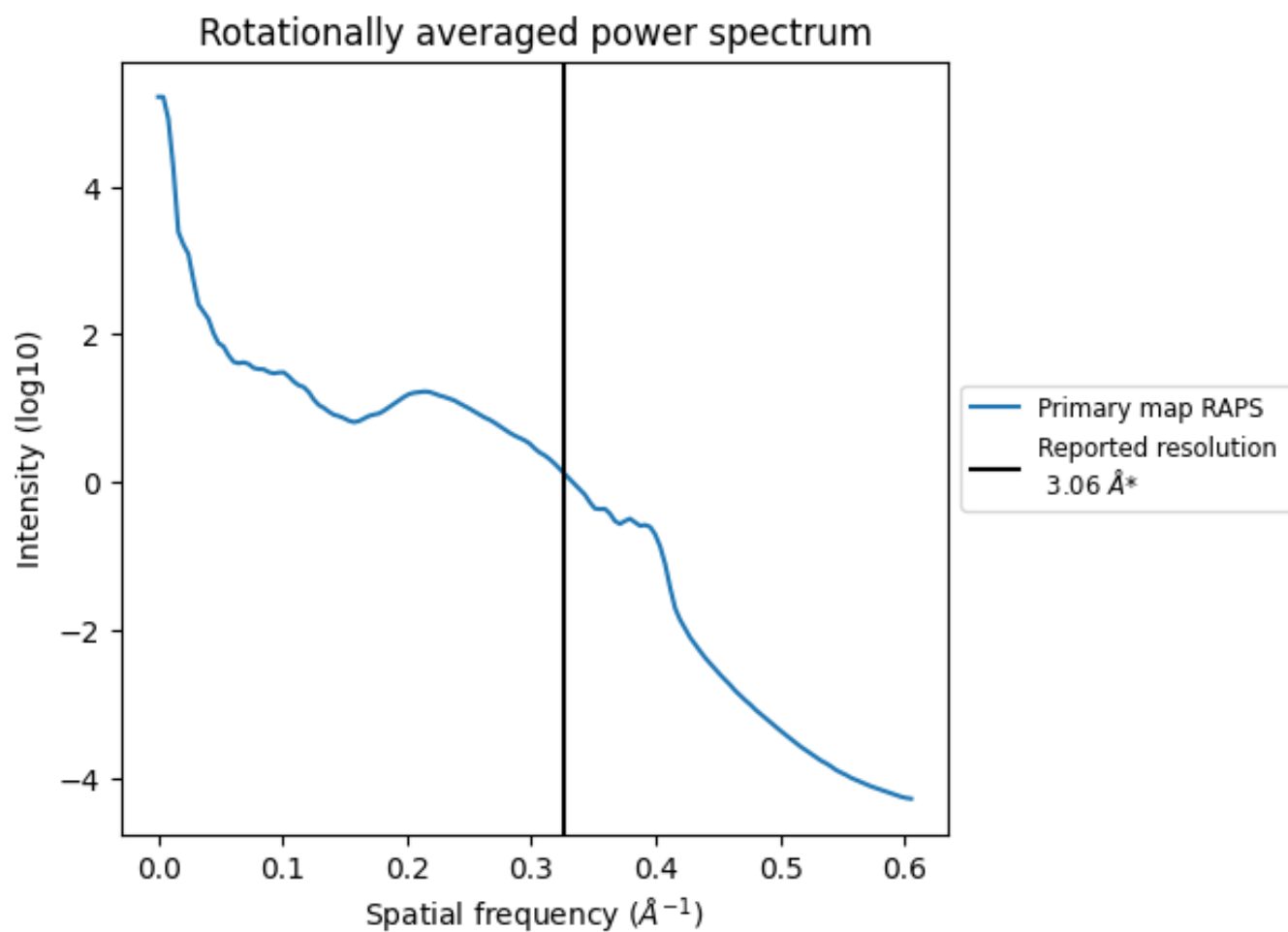


The volume at the recommended contour level is 143  $\text{nm}^3$ ; this corresponds to an approximate mass of 130 kDa.

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 [i](#)

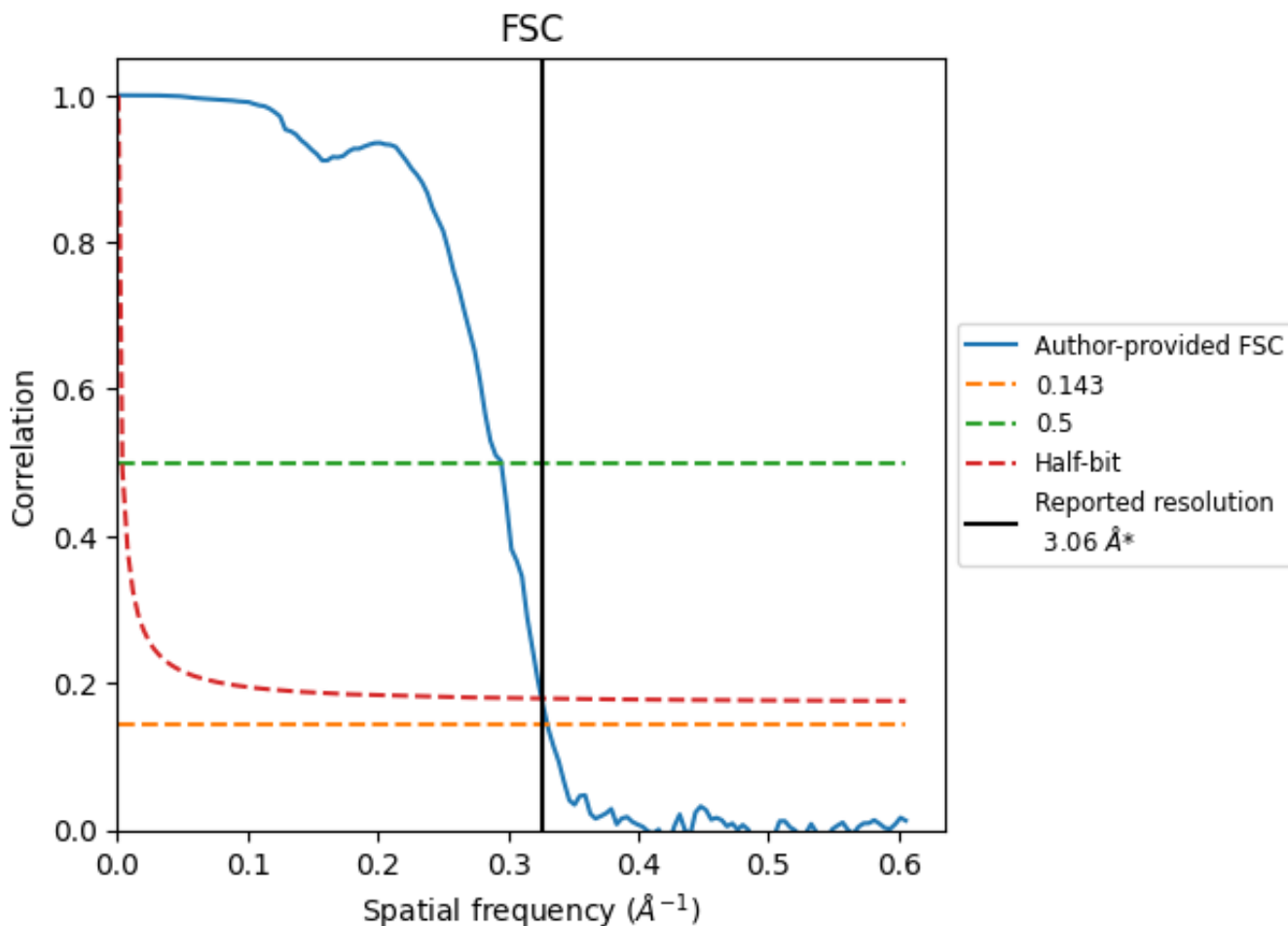


\*Reported resolution corresponds to spatial frequency of 0.327 Å<sup>-1</sup>

## 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 0.327 Å<sup>-1</sup>

## 8.2 Resolution estimates [i](#)

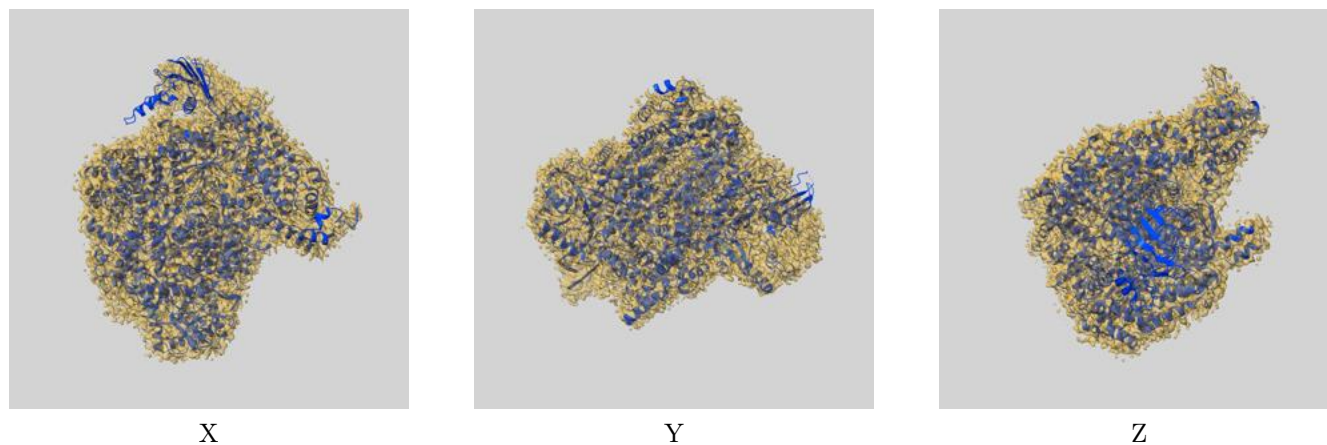
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.06	-	-
Author-provided FSC curve	3.03	3.39	3.07
Unmasked-calculated*	-	-	-

\*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps.

## 9 Map-model fit [i](#)

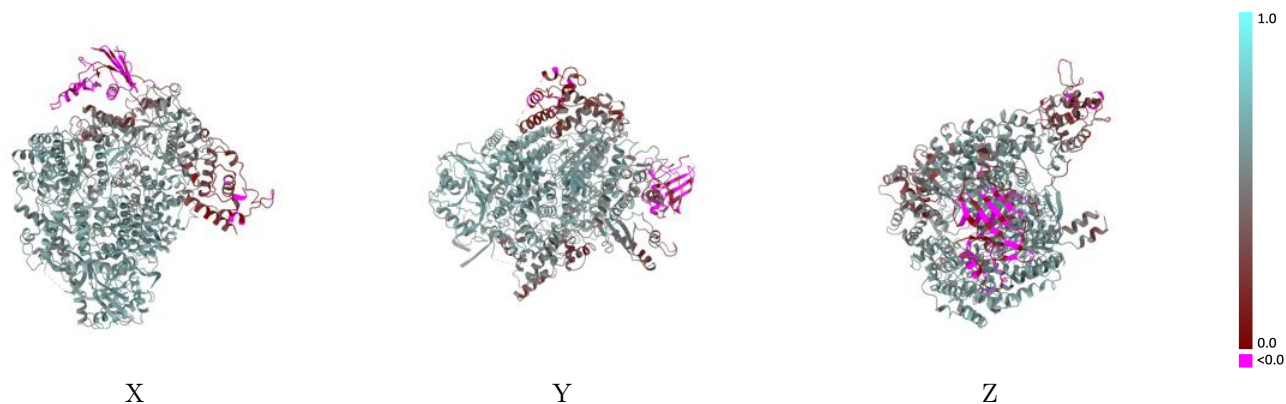
This section contains information regarding the fit between EMDB map EMD-11093 and PDB model 6Z6G. Per-residue inclusion information can be found in section 3 on page 5.

### 9.1 Map-model overlay [i](#)



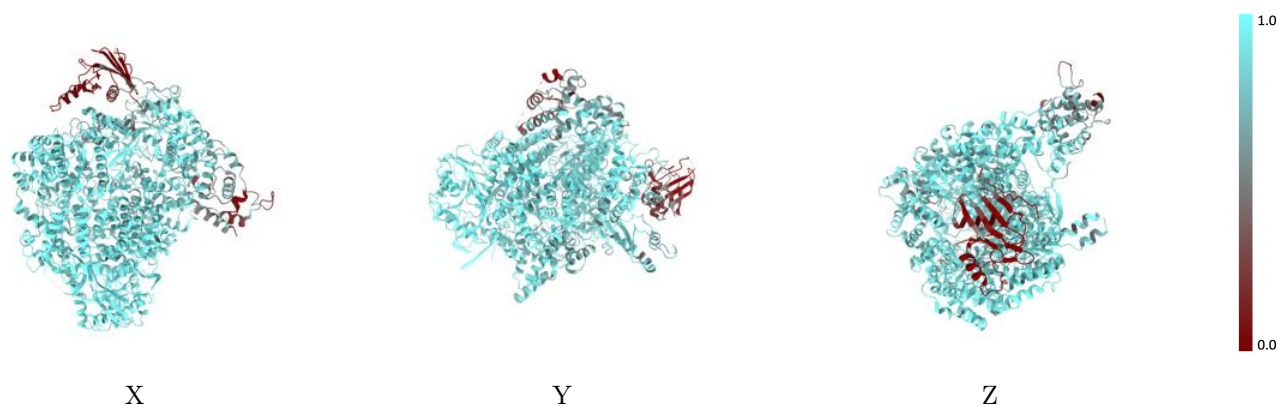
The images above show the 3D surface view of the map at the recommended contour level 0.01 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



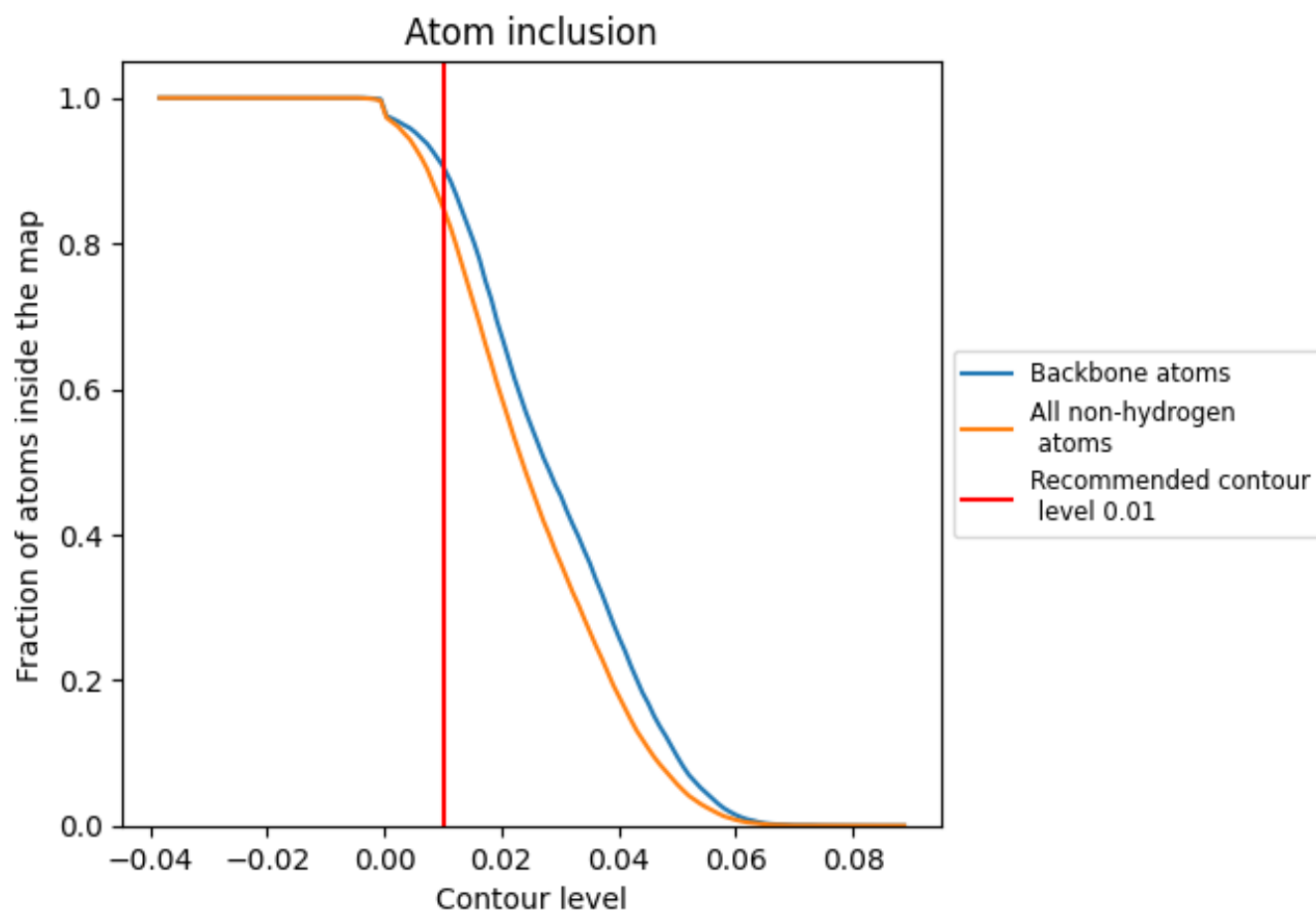
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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, 91% of all backbone atoms, 85% 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	 0.8504	 0.4990
A	 0.8458	 0.4970
H	 0.9818	 0.5870
U	 0.9861	 0.5910
X	 0.9802	 0.5130

