



## Full wwPDB EM Validation Report ⓘ

Nov 20, 2022 – 04:00 am GMT

PDB ID : 6GSH  
EMDB ID : EMD-0054  
Title : Feline Calicivirus Strain F9  
Authors : Conley, M.J.; Bhella, D.  
Deposited on : 2018-06-14  
Resolution : 3.00 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](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) : 2.31.2

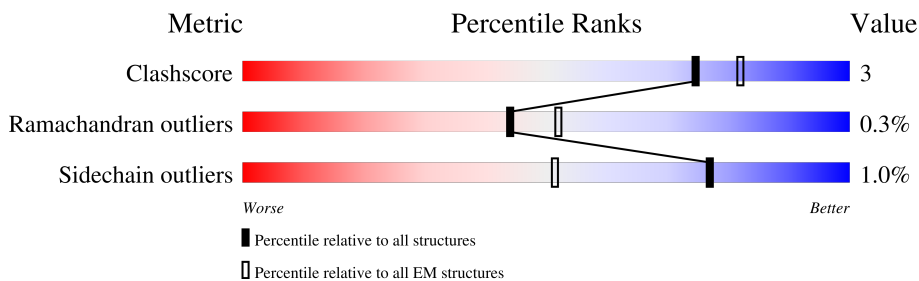
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 3.00 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

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	A	669	<p>80% 74% 5% 20%</p>
1	B	669	<p>79% 73% 6% 21%</p>
1	C	669	<p>80% 72% 7% 20%</p>

## 2 Entry composition i

There are 2 unique types of molecules in this entry. The entry contains 24297 atoms, of which 12040 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 VP1.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
1	A	533	8100	2606	4014	680	789	11	0	0
1	B	530	8071	2596	4000	680	784	11	0	0
1	C	534	8123	2612	4026	684	790	11	0	0

There are 150 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	13	ASN	ASP	conflict	UNP A2T4P8
A	21	VAL	ILE	conflict	UNP A2T4P8
A	23	ASP	ASN	conflict	UNP A2T4P8
A	73	ALA	SER	conflict	UNP A2T4P8
A	82	ALA	SER	conflict	UNP A2T4P8
A	90	ALA	GLU	conflict	UNP A2T4P8
A	94	ILE	LEU	conflict	UNP A2T4P8
A	108	GLY	ASN	conflict	UNP A2T4P8
A	127	GLY	-	insertion	UNP A2T4P8
A	133	ALA	THR	conflict	UNP A2T4P8
A	139	PRO	MET	conflict	UNP A2T4P8
A	148	SER	ASN	conflict	UNP A2T4P8
A	149	ALA	THR	conflict	UNP A2T4P8
A	304	SER	THR	conflict	UNP A2T4P8
A	319	ALA	PRO	conflict	UNP A2T4P8
A	345	LYS	ARG	conflict	UNP A2T4P8
A	355	HIS	TYR	conflict	UNP A2T4P8
A	357	THR	SER	conflict	UNP A2T4P8
A	363	VAL	ILE	conflict	UNP A2T4P8
A	392	ILE	MET	conflict	UNP A2T4P8
A	402	ALA	SER	conflict	UNP A2T4P8
A	429	LYS	THR	conflict	UNP A2T4P8
A	440	ASN	ASP	conflict	UNP A2T4P8
A	441	LYS	GLN	conflict	UNP A2T4P8

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Chain	Residue	Modelled	Actual	Comment	Reference
A	442	SER	THR	conflict	UNP A2T4P8
A	447	THR	VAL	conflict	UNP A2T4P8
A	449	ALA	PRO	conflict	UNP A2T4P8
A	450	ALA	SER	conflict	UNP A2T4P8
A	451	GLY	ARG	conflict	UNP A2T4P8
A	452	TYR	PHE	conflict	UNP A2T4P8
A	454	GLY	ALA	conflict	UNP A2T4P8
A	456	ASP	ILE	conflict	UNP A2T4P8
A	457	VAL	THR	conflict	UNP A2T4P8
A	472	SER	ALA	conflict	UNP A2T4P8
A	493	LYS	ARG	conflict	UNP A2T4P8
A	494	VAL	GLU	conflict	UNP A2T4P8
A	495	ASP	ASN	conflict	UNP A2T4P8
A	497	ALA	LYS	conflict	UNP A2T4P8
A	498	ILE	LEU	conflict	UNP A2T4P8
A	499	GLU	ILE	conflict	UNP A2T4P8
A	506	MET	ALA	conflict	UNP A2T4P8
A	515	THR	ALA	conflict	UNP A2T4P8
A	519	LYS	ALA	conflict	UNP A2T4P8
A	529	SER	ALA	conflict	UNP A2T4P8
A	539	GLN	GLU	conflict	UNP A2T4P8
A	543	SER	ALA	conflict	UNP A2T4P8
A	603	PRO	ALA	conflict	UNP A2T4P8
A	615	SER	CYS	conflict	UNP A2T4P8
A	636	SER	ASN	conflict	UNP A2T4P8
A	665	SER	THR	conflict	UNP A2T4P8
B	13	ASN	ASP	conflict	UNP A2T4P8
B	21	VAL	ILE	conflict	UNP A2T4P8
B	23	ASP	ASN	conflict	UNP A2T4P8
B	73	ALA	SER	conflict	UNP A2T4P8
B	82	ALA	SER	conflict	UNP A2T4P8
B	90	ALA	GLU	conflict	UNP A2T4P8
B	94	ILE	LEU	conflict	UNP A2T4P8
B	108	GLY	ASN	conflict	UNP A2T4P8
B	127	GLY	-	insertion	UNP A2T4P8
B	133	ALA	THR	conflict	UNP A2T4P8
B	139	PRO	MET	conflict	UNP A2T4P8
B	148	SER	ASN	conflict	UNP A2T4P8
B	149	ALA	THR	conflict	UNP A2T4P8
B	304	SER	THR	conflict	UNP A2T4P8
B	319	ALA	PRO	conflict	UNP A2T4P8
B	345	LYS	ARG	conflict	UNP A2T4P8

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Chain	Residue	Modelled	Actual	Comment	Reference
B	355	HIS	TYR	conflict	UNP A2T4P8
B	357	THR	SER	conflict	UNP A2T4P8
B	363	VAL	ILE	conflict	UNP A2T4P8
B	392	ILE	MET	conflict	UNP A2T4P8
B	402	ALA	SER	conflict	UNP A2T4P8
B	429	LYS	THR	conflict	UNP A2T4P8
B	440	ASN	ASP	conflict	UNP A2T4P8
B	441	LYS	GLN	conflict	UNP A2T4P8
B	442	SER	THR	conflict	UNP A2T4P8
B	447	THR	VAL	conflict	UNP A2T4P8
B	449	ALA	PRO	conflict	UNP A2T4P8
B	450	ALA	SER	conflict	UNP A2T4P8
B	451	GLY	ARG	conflict	UNP A2T4P8
B	452	TYR	PHE	conflict	UNP A2T4P8
B	454	GLY	ALA	conflict	UNP A2T4P8
B	456	ASP	ILE	conflict	UNP A2T4P8
B	457	VAL	THR	conflict	UNP A2T4P8
B	472	SER	ALA	conflict	UNP A2T4P8
B	493	LYS	ARG	conflict	UNP A2T4P8
B	494	VAL	GLU	conflict	UNP A2T4P8
B	495	ASP	ASN	conflict	UNP A2T4P8
B	497	ALA	LYS	conflict	UNP A2T4P8
B	498	ILE	LEU	conflict	UNP A2T4P8
B	499	GLU	ILE	conflict	UNP A2T4P8
B	506	MET	ALA	conflict	UNP A2T4P8
B	515	THR	ALA	conflict	UNP A2T4P8
B	519	LYS	ALA	conflict	UNP A2T4P8
B	529	SER	ALA	conflict	UNP A2T4P8
B	539	GLN	GLU	conflict	UNP A2T4P8
B	543	SER	ALA	conflict	UNP A2T4P8
B	603	PRO	ALA	conflict	UNP A2T4P8
B	615	SER	CYS	conflict	UNP A2T4P8
B	636	SER	ASN	conflict	UNP A2T4P8
B	665	SER	THR	conflict	UNP A2T4P8
C	13	ASN	ASP	conflict	UNP A2T4P8
C	21	VAL	ILE	conflict	UNP A2T4P8
C	23	ASP	ASN	conflict	UNP A2T4P8
C	73	ALA	SER	conflict	UNP A2T4P8
C	82	ALA	SER	conflict	UNP A2T4P8
C	90	ALA	GLU	conflict	UNP A2T4P8
C	94	ILE	LEU	conflict	UNP A2T4P8
C	108	GLY	ASN	conflict	UNP A2T4P8

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Chain	Residue	Modelled	Actual	Comment	Reference
C	127	GLY	-	insertion	UNP A2T4P8
C	133	ALA	THR	conflict	UNP A2T4P8
C	139	PRO	MET	conflict	UNP A2T4P8
C	148	SER	ASN	conflict	UNP A2T4P8
C	149	ALA	THR	conflict	UNP A2T4P8
C	304	SER	THR	conflict	UNP A2T4P8
C	319	ALA	PRO	conflict	UNP A2T4P8
C	345	LYS	ARG	conflict	UNP A2T4P8
C	355	HIS	TYR	conflict	UNP A2T4P8
C	357	THR	SER	conflict	UNP A2T4P8
C	363	VAL	ILE	conflict	UNP A2T4P8
C	392	ILE	MET	conflict	UNP A2T4P8
C	402	ALA	SER	conflict	UNP A2T4P8
C	429	LYS	THR	conflict	UNP A2T4P8
C	440	ASN	ASP	conflict	UNP A2T4P8
C	441	LYS	GLN	conflict	UNP A2T4P8
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C	447	THR	VAL	conflict	UNP A2T4P8
C	449	ALA	PRO	conflict	UNP A2T4P8
C	450	ALA	SER	conflict	UNP A2T4P8
C	451	GLY	ARG	conflict	UNP A2T4P8
C	452	TYR	PHE	conflict	UNP A2T4P8
C	454	GLY	ALA	conflict	UNP A2T4P8
C	456	ASP	ILE	conflict	UNP A2T4P8
C	457	VAL	THR	conflict	UNP A2T4P8
C	472	SER	ALA	conflict	UNP A2T4P8
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C	495	ASP	ASN	conflict	UNP A2T4P8
C	497	ALA	LYS	conflict	UNP A2T4P8
C	498	ILE	LEU	conflict	UNP A2T4P8
C	499	GLU	ILE	conflict	UNP A2T4P8
C	506	MET	ALA	conflict	UNP A2T4P8
C	515	THR	ALA	conflict	UNP A2T4P8
C	519	LYS	ALA	conflict	UNP A2T4P8
C	529	SER	ALA	conflict	UNP A2T4P8
C	539	GLN	GLU	conflict	UNP A2T4P8
C	543	SER	ALA	conflict	UNP A2T4P8
C	603	PRO	ALA	conflict	UNP A2T4P8
C	615	SER	CYS	conflict	UNP A2T4P8
C	636	SER	ASN	conflict	UNP A2T4P8
C	665	SER	THR	conflict	UNP A2T4P8

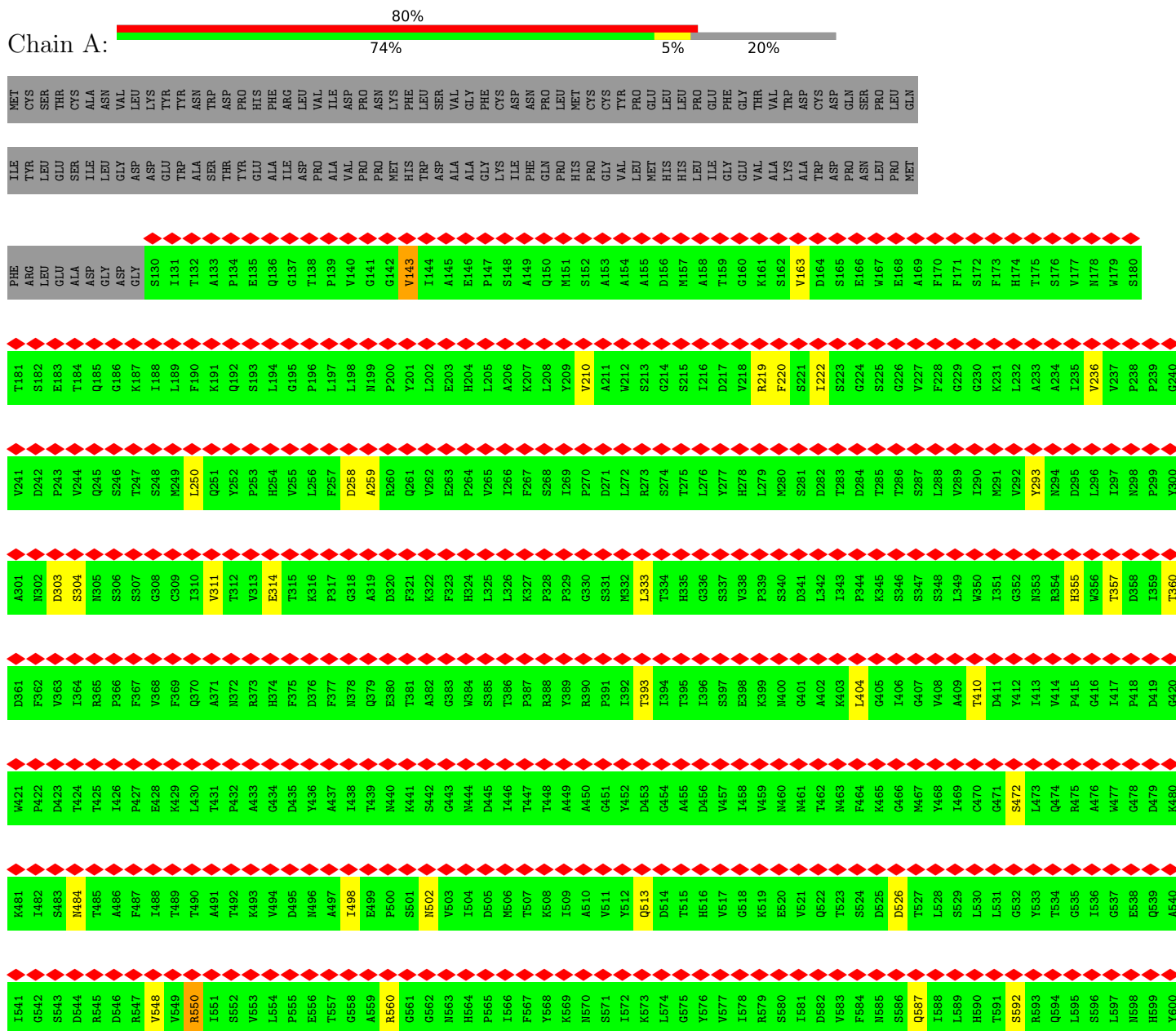
- Molecule 2 is POTASSIUM ION (three-letter code: K) (formula: K).

Mol	Chain	Residues	Atoms	AltConf
2	A	1	Total K 1 1	0
2	B	1	Total K 1 1	0
2	C	1	Total K 1 1	0

### 3 Residue-property plots [i](#)

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: VP1

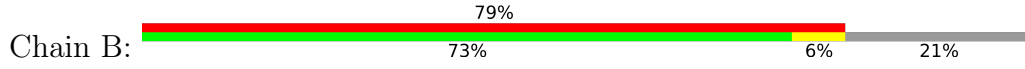




L601	L602	P603	P604	D605	S606	F607	A608	V609	Y610	R611	I612	I613	D614	S615	M616	G617	S618	W619	F620	D621	I622	G623	I624	D625	D626	D627	G628	F629	S630	F631	G632	G633	V634	S635	S636	I637	G638	K639	L640	E641	P642	P643	L644	T645	A646	S647	Y648	M649	G650	I651	Q652	L653	A654	K655	I656	R657	L658	A659	S660
------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------

M661	I662	ARG	SER	SER	MET	THR	LYS	LEU
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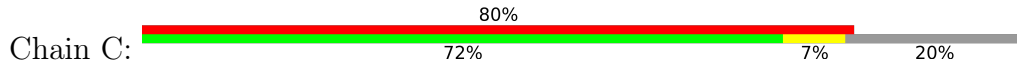
• Molecule 1: VP1



MET	CYS	SER	THR	CYS	ALA	ASN	VAL	LEU	LYS	TYR	TRP	ASN	ALA	SER	TRP	ASP	PRO	HIS	PHE	ASP	LEU	SER	VAL	GLY	PHE	CYS	LYS	ASP	ASN	PRO	GLN	LEU	LEU	MET	CYS	PRO	CYS	GLY	GLU	PHE	THR	VAL	TRP	TRP	ASP	CYS	ASP	GLN	SER	LEU	PRO	LEU	GLN							
ILE	TYR	GLU	GLU	SER	ILE	LEU	GLY	ASP	ASP	GLU	TRP	TYR	ALA	SER	TRP	THR	THR	TYR	GLU	ALA	ALA	ASP	PRO	VAL	GLY	PHE	ILE	ASN	PRO	GLN	PRO	HIS	PRO	HIS	PRO	CYS	GLY	ILE	GLU	GLY	VAL	VAL	ALA	ALA	TRP	TRP	ASP	ASP	PRO	ASN	SER	PRO	LEU	PRO	MET					
PHE	ARG	LEU	GLU	ALA	ASP	GLY	ASP	GLY	SER	ILE	THR	THR	ALA	PI34	EI35	QI36	G137	T138	P139	V140	G141	G142	V143	I144	A145	E146	P147	S148	A149	Q150	M151	S152	A153	A154	A155	M157	A158	T159	K161	S162	V163	D164	S165	E166	W167	E168	A169	F170	F171	S172	F173	H174	T175	V177	M178	W179	S180			
T181	S182	E183	T184	Q185	G186	K187	I188	F189	F190	K191	Q192	S193	L194	G195	P196	L197	L198	M199	P200	Y201	L202	E203	H204	L205	A206	K207	L208	Y209	V210	A211	V212	S213	G214	S215	I216	D217	V218	R219	F220	S221	I222	S223	G224	S225	G226	V227	F228	G229	G230	K231	L232	A233	A234	I235	V236	P237	P238	G240		
V241	D242	P243	V244	Q245	S246	T247	S248	M249	L250	Q251	Y252	P253	H254	V255	L256	F257	D258	A259	R260	Q261	V262	E263	P264	V265	P266	F267	S268	I269	P270	D271	L272	R273	S274	T275	L276	Y277	H278	L279	M280	S281	D282	T283	D284	T285	T286	S287	L288	V289	L290	M291	V292	N293	N294	D295	L296	I297	N298	P299	Y300	
A301	N302	D303	S304	N305	S306	S307	G308	C309	L310	V311	T312	S313	E314	T315	K316	P317	G318	Q319	D320	F321	K322	F323	H324	L325	L326	K327	P328	P329	G330	S331	K332	L333	T334	H335	G336	S337	V338	P339	S340	D341	A342	K343	P344	K345	K346	T346	S347	S348	L349	W350	I351	G352	N353	R354	H355	W356	T357	P358	I359	G420
D361	F362	V363	I364	R365	P366	F367	V368	F369	K370	A371	N372	R373	H374	F375	D376	F377	N378	Q379	E380	T381	A382	G383	W384	S385	P387	R388	Y389	R390	P391	I392	T393	I394	T395	I396	S397	E398	K399	N400	G401	A402	K403	L404	G405	L406	G407	V408	A409	L410	D411	Y412	L413	W414	F415	G416	L417	P418	D419	G420		
W421	D422	D423	T424	T425	I426	P427	E428	K429	L430	T431	P432	A433	G434	D435	Y436	A437	I438	T439	M440	K441	S442	G443	M444	D445	L446	T447	T448	A449	A450	A451	G452	D453	G454	A455	D456	V457	I458	V459	N460	M461	T462	M463	F464	K465	G466	G467	Y468	L469	C470	G471	S472	L473	L474	O475	R476	A477	W478	D479	K480	
K481	I482	S483	M484	T485	A486	F487	L488	T489	T490	A491	T492	K493	V494	D495	M496	A497	L498	E499	P500	S501	N502	V503	I504	D505	M506	T507	K508	I509	A510	V511	Y512	Q513	D514	T515	H516	V517	G518	K519	E520	V521	O522	T523	S524	D525	D526	T527	L528	S529	M530	L531	G532	Y533	T534	G535	L536	A476	W477	E538	Q539	A540
I541	G542	S543	D544	R545	D546	R547	V548	V549	R550	I551	S552	V553	L554	P555	E556	T557	G558	A559	R560	G561	G562	M563	H564	P565	S566	F567	Y568	S569	N570	S571	I572	K573	L574	G575	Y576	Y577	I578	R579	S580	I581	D582	V583	F584	M585	G586	S587	L588	L589	H590	T591	S592	R593	O594	L595	L596	S597	N598	H599	Y600	
L601	L602	P603	P604	D605	S606	F607	A608	V609	Y610	R611	I612	I613	D614	S615	M616	G617	S618	W619	F620	D621	I622	G623	I624	D625	D626	D627	G628	F629	S630	F631	G632	G633	V634	S635	S636	I637	G638	K639	L640	E641	P642	P643	L644	T645	A646	S647	Y648	M649	G650	I651	Q652	L653	A654	K655	I656	R657	L658	A659	S660	

N661
I662
R663
SER
SER
MET
THR
LYS
LEU

• Molecule 1: VP1



MET	ILE	PHE	T181	V241	A301	D361	W421	K481	I541	L601
CYS	TYR	ARG	S182	D242	N302	F362	P422	I482	G542	L602
SER	GLU	GLU	S183	F243	D303	V363	D423	S483	S543	L603
THR	LEU	ALA	T184	V244	S304	I364	T424	N484	D544	P604
CYS	SER	ALA	Q185	Q245	N305	I365	T425	T485	R545	D605
ALA	ILE	GLY	Q186	S246	S306	P366	I426	T486	D546	S606
ASN	LEU	ASP	G187	T247	S307	F367	P427	F487	R547	F607
VAL	GLY	ASP	K188	S248	G308	V368	E428	I488	V548	A608
LEU	ASP	GLY	I189	M249	C309	V369	K429	T489	V549	V609
LYS	GLU	TRP	F190	L250	I310	Q370	L430	T490	R550	Y610
TYR	TRP	ALA	K191	Q251	V311	A371	T431	A491	I551	R611
TRP	SER	ALA	Q192	Y252	T312	N372	P432	T492	S552	I612
ASN	THR	THR	S193	P253	V313	A373	A433	K493	V553	I613
TRP	THR	GLU	E194	H254	R374	H374	O434	V494	L554	D614
ASP	TYR	ALA	G195	V255	T315	F375	O435	D495	P555	S615
HIS	GLU	PHE	L196	L256	K316	D376	Y436	N496	E556	N616
PHE	ILE	ARG	P197	F257	P317	F377	A437	A497	T557	G617
ARG	ASP	LEU	L198	D258	G318	N378	I438	I498	G558	S618
LEU	VAL	PRO	V140	A259	A319	N379	T439	E499	A559	W619
VAL	ALA	VAL	G141	A260	D320	E380	N440	P500	R560	F620
ASP	ASP	ASP	G142	Q261	F321	T381	K441	G561	G621	D621
PRO	PRO	HIS	V143	Y202	K322	A382	S442	S502	G622	I622
ASN	PRO	TRP	I144	L202	F323	G383	G443	V503	N563	G623
LYS	MET	ALA	A145	E203	H324	W384	I444	I504	H564	I624
PHE	GLY	ALA	E146	H204	L325	S385	D445	D505	P565	D625
CYS	GLY	PHE	L205	V265	L326	T386	I446	M506	I566	S626
LYS	ILE	ASP	S148	L206	K327	F387	T447	T507	F567	D627
ASP	ILE	ASP	A149	F267	P328	R388	T448	K508	Y568	G628
ASN	PHE	GLN	Q150	S268	P329	Y389	A449	I509	K569	F629
PRO	GLN	PRO	M151	I269	G330	R390	A450	A510	N570	S630
LEU	HIS	LEU	A152	Y209	S331	P391	G451	V511	S571	F631
MET	PRO	HIS	A153	V210	M332	I392	Y452	Y512	I572	V632
CYS	GLY	VAL	A154	A211	L333	T393	D453	Q513	K573	G633
TYR	VAL	LEU	A155	W212	L334	T394	O454	D514	L574	V634
PRO	LEU	MET	A156	G214	H335	T395	A455	T515	G575	S635
GLU	LEU	LEU	D156	G214	G336	I396	D456	H516	Y576	S636
LEU	HIS	HIS	M157	S215	S337	S397	V457	V517	V577	I637
LEU	ILE	LEU	A158	I216	G338	S398	I458	I518	I578	G638
PRO	GLU	GLY	T159	D217	S339	S399	V459	K519	R579	K639
PHE	GLY	PHE	G160	V218	D340	N400	N460	E520	S580	L640
GLY	VAL	THR	K161	R219	D341	G401	N461	V521	I581	E641
VAL	ALA	VAL	S162	F220	L342	A402	T462	O522	D582	F642
ALA	LYS	TRP	V163	S221	I343	K403	N463	T523	V583	F643
TRP	ASP	ASP	D164	L222	P344	L404	F464	S524	F584	L644
ASP	ASP	ASP	S165	S223	K345	G405	K465	D525	N585	T645
ASP	PRO	ASP	E166	G224	S346	I406	G466	D526	S586	A646
SER	ASN	SER	W167	S225	S347	G407	H467	T527	Q587	S647
PRO	LEU	PRO	E168	G226	S348	V408	I468	L528	I588	Y648
LEU	PRO	LEU	A169	V227	L288	W408	I469	S529	L589	M649
LEU	PRO	GLN	F170	F228	L349	A409	I469	S530	H590	G650
GLN	TRP	TRP	F171	G229	L350	T410	C470	C471	G591	G652
LEU	TRP	TRP	S172	G230	I351	D411	G471	S472	S592	G653
LEU	TRP	TRP	F173	L232	G352	Y412	K472	L473	R593	L653
LEU	TRP	TRP	H174	L233	N353	I413	L473	T534	O594	A654
LEU	TRP	TRP	T175	A233	R354	V414	O474	T534	L595	K655
LEU	TRP	TRP	S176	A234	H355	P415	R475	G535	L596	K656
LEU	TRP	TRP	W177	I235	W356	O416	A476	I536	S596	T656
LEU	TRP	TRP	N178	V236	T357	I417	W477	G537	L597	R657
LEU	TRP	TRP	A179	V237	D358	P418	W478	E538	N598	L658
LEU	TRP	TRP	S180	P238	I297	I419	D479	Q539	H599	A659
LEU	TRP	TRP		P239	Y300	D420	K480	A540	Y600	S660

## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, I	Depositor
Number of particles used	41436	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION; CTF correction was implemented through Relion	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	63	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	75000	Depositor
Image detector	FEI FALCON III (4k x 4k)	Depositor
Maximum map value	0.459	Depositor
Minimum map value	-0.255	Depositor
Average map value	0.003	Depositor
Map value standard deviation	0.028	Depositor
Recommended contour level	0.05	Depositor
Map size ( $\text{\AA}$ )	545.28, 545.28, 545.28	wwPDB
Map dimensions	512, 512, 512	wwPDB
Map angles ( $^\circ$ )	90.0, 90.0, 90.0	wwPDB
Pixel spacing ( $\text{\AA}$ )	1.065, 1.065, 1.065	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:  
K

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	0.45	0/4188	0.63	1/5711 (0.0%)
1	B	0.44	0/4173	0.62	1/5688 (0.0%)
1	C	0.47	0/4199	0.63	0/5725
All	All	0.45	0/12560	0.63	2/17124 (0.0%)

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	642	PHE	N-CA-C	5.97	127.11	111.00
1	A	642	PHE	N-CA-C	5.75	126.54	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	A	4086	4014	4017	22	0
1	B	4071	4000	4003	28	0
1	C	4097	4026	4030	29	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
2	C	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
All	All	12257	12040	12050	78	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 3.

All (78) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:360:THR:O	1:B:642:PHE:CE1	1.87	1.26
1:C:616:ASN:ND2	1:C:641:GLU:OE2	1.93	1.01
1:B:446:ILE:O	1:B:576:TYR:OH	1.83	0.96
1:B:360:THR:O	1:B:642:PHE:CD1	2.31	0.83
1:C:473:LEU:O	1:C:483:SER:OG	1.97	0.81
1:C:570:ASN:OD1	1:C:585:ASN:ND2	2.15	0.78
1:A:587:GLN:OE1	1:A:592:SER:OG	2.03	0.77
1:A:502:ASN:OD1	1:A:550:ARG:NH2	2.19	0.75
1:B:372:ASN:OD1	1:B:385:SER:OG	2.08	0.71
1:A:548:VAL:O	1:A:550:ARG:NH2	2.25	0.69
1:C:548:VAL:O	1:C:550:ARG:NH1	2.26	0.69
1:A:472:SER:OG	1:A:484:ASN:O	2.12	0.68
1:B:616:ASN:HB2	1:B:641:GLU:OE2	1.94	0.67
1:B:438:ILE:HD12	1:B:576:TYR:CE2	2.30	0.66
1:A:560:ARG:NH2	1:A:604:PRO:O	2.29	0.65
1:A:616:ASN:OD1	1:A:641:GLU:HG3	1.97	0.65
1:A:513:GLN:NE2	1:A:526:ASP:OD1	2.30	0.64
1:B:360:THR:O	1:B:642:PHE:CZ	2.47	0.64
1:C:560:ARG:NH2	1:C:604:PRO:O	2.31	0.64
1:B:484:ASN:O	1:B:513:GLN:NE2	2.31	0.63
1:B:593:ARG:O	1:B:596:SER:OG	2.14	0.63
1:C:642:PHE:O	1:C:644:LEU:N	2.34	0.60
1:C:641:GLU:OE1	1:C:641:GLU:N	2.36	0.58
1:C:465:LYS:O	1:C:534:THR:OG1	2.04	0.58
1:B:339:PRO:O	1:B:610:TYR:OH	2.21	0.57
1:C:615:SER:HB2	1:C:641:GLU:HG2	1.86	0.56
1:C:339:PRO:O	1:C:610:TYR:OH	2.18	0.56
1:B:612:ILE:CD1	1:B:622:ILE:HD12	2.37	0.55
1:A:393:THR:OG1	1:A:410:THR:OG1	2.26	0.54
1:B:438:ILE:HD12	1:B:576:TYR:HE2	1.74	0.53
1:B:533:TYR:OH	1:B:547:ARG:NH1	2.40	0.52
1:B:587:GLN:OE1	1:B:592:SER:OG	2.16	0.52
1:A:404:LEU:HD11	1:A:498:ILE:HG23	1.92	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:210:VAL:HG23	1:A:333:LEU:HD22	1.92	0.51
1:C:612:ILE:HG23	1:C:644:LEU:HD13	1.92	0.51
1:B:357:THR:O	1:B:570:ASN:ND2	2.44	0.50
1:A:404:LEU:HD11	1:A:498:ILE:CG2	2.41	0.50
1:C:258:ASP:OD1	1:C:259:ALA:N	2.45	0.50
1:B:258:ASP:OD1	1:B:259:ALA:N	2.45	0.50
1:B:362:PHE:CD1	1:B:362:PHE:N	2.79	0.49
1:B:460:ASN:ND2	1:B:462:THR:HG22	2.27	0.49
1:A:355:HIS:CD2	1:A:357:THR:HG23	2.48	0.49
1:C:578:ILE:HG22	1:C:578:ILE:O	2.13	0.48
1:A:219:ARG:NH2	1:A:314:GLU:OE1	2.45	0.47
1:C:587:GLN:OE1	1:C:592:SER:OG	2.13	0.47
1:B:265:VAL:HG12	1:C:131:ILE:HD11	1.96	0.47
1:A:404:LEU:HD13	1:A:404:LEU:O	2.13	0.47
1:C:560:ARG:NH1	1:C:625:ASP:OD1	2.49	0.46
1:C:462:THR:HG22	1:C:464:PHE:H	1.80	0.46
1:A:250:LEU:HD13	1:A:293:TYR:CD1	2.50	0.46
1:B:470:CYS:CB	1:B:528:LEU:HD12	2.45	0.46
1:C:215:SER:OG	1:C:320:ASP:OD1	2.24	0.45
1:A:258:ASP:OD1	1:A:259:ALA:N	2.50	0.45
1:B:219:ARG:NH2	1:B:314:GLU:OE1	2.50	0.44
1:B:578:ILE:O	1:B:578:ILE:HG22	2.17	0.44
1:B:642:PHE:O	1:B:642:PHE:CD2	2.71	0.44
1:C:236:VAL:HG23	1:C:236:VAL:O	2.18	0.44
1:A:236:VAL:O	1:A:236:VAL:HG23	2.18	0.44
1:B:438:ILE:HD12	1:B:576:TYR:CD2	2.52	0.44
1:C:492:THR:HG22	1:C:508:LYS:HE2	1.98	0.44
1:B:354:ARG:NH1	1:B:423:ASP:OD1	2.51	0.44
1:C:616:ASN:CG	1:C:641:GLU:OE2	2.54	0.44
1:A:163:VAL:O	1:A:163:VAL:HG13	2.18	0.43
1:B:576:TYR:O	1:B:576:TYR:CD1	2.70	0.43
1:C:219:ARG:N	1:C:314:GLU:O	2.51	0.43
1:A:360:THR:O	1:A:642:PHE:CE1	2.72	0.43
1:C:541:ILE:HD12	1:C:583:VAL:HG22	2.01	0.43
1:B:625:ASP:OD1	1:B:626:SER:N	2.51	0.43
1:C:545:ARG:NH1	1:C:556:GLU:OE2	2.50	0.42
1:C:355:HIS:CD2	1:C:357:THR:HG23	2.54	0.42
1:A:222:ILE:HG12	1:A:311:VAL:HG22	2.01	0.41
1:C:625:ASP:OD1	1:C:626:SER:N	2.53	0.41
1:A:303:ASP:OD1	1:A:304:SER:N	2.54	0.41
1:C:236:VAL:HG12	1:C:288:LEU:HD13	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:456:ASP:OD1	1:C:457:VAL:N	2.53	0.41
1:C:474:GLN:CD	1:C:474:GLN:O	2.59	0.41
1:B:470:CYS:HB2	1:B:528:LEU:HD12	2.03	0.41
1:A:616:ASN:OD1	1:A:641:GLU:CG	2.67	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	531/669 (79%)	484 (91%)	45 (8%)	2 (0%)	34 72
1	B	528/669 (79%)	478 (90%)	49 (9%)	1 (0%)	47 82
1	C	532/669 (80%)	480 (90%)	50 (9%)	2 (0%)	34 72
All	All	1591/2007 (79%)	1442 (91%)	144 (9%)	5 (0%)	44 76

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	143	VAL
1	B	642	PHE
1	A	642	PHE
1	C	516	HIS
1	C	471	GLY

### 5.3.2 Protein sidechains [i](#)

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

The Analysed column shows the number of residues for which the sidechain conformation was

analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	453/572 (79%)	449 (99%)	4 (1%)	78	92
1	B	451/572 (79%)	447 (99%)	4 (1%)	78	92
1	C	454/572 (79%)	448 (99%)	6 (1%)	69	89
All	All	1358/1716 (79%)	1344 (99%)	14 (1%)	77	91

All (14) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	143	VAL
1	A	220	PHE
1	A	550	ARG
1	A	642	PHE
1	B	460	ASN
1	B	516	HIS
1	B	550	ARG
1	B	642	PHE
1	C	388	ARG
1	C	440	ASN
1	C	489	THR
1	C	550	ARG
1	C	641	GLU
1	C	642	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	400	ASN
1	C	616	ASN

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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



## 5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 3 ligands modelled in this entry, 3 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.

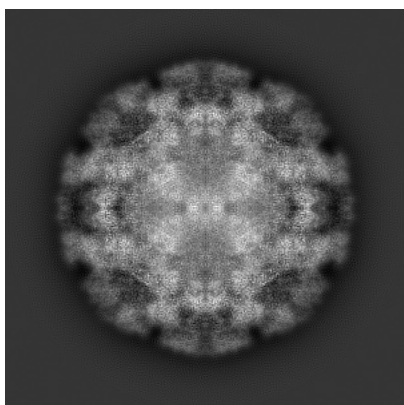
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-0054. These allow visual inspection of the internal detail of the map and identification of artifacts.

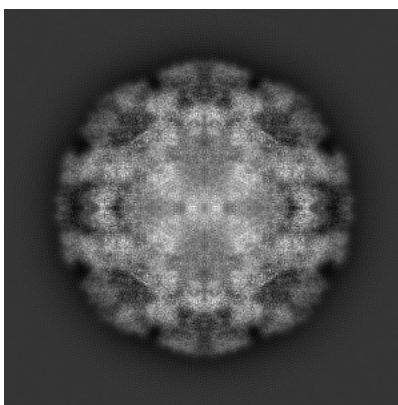
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

### 6.1 Orthogonal projections [i](#)

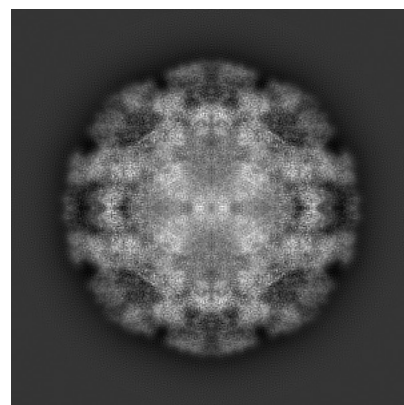
#### 6.1.1 Primary map



X



Y

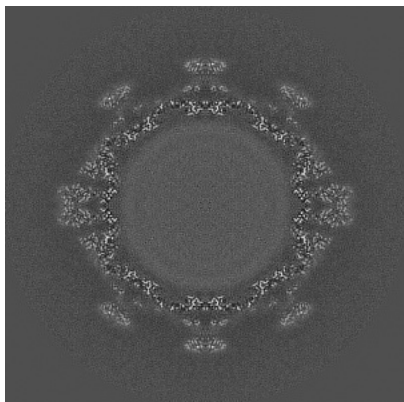


Z

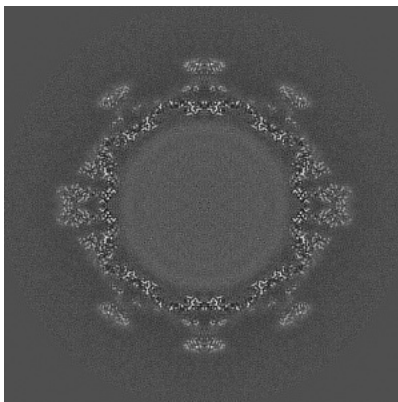
The images above show the map projected in three orthogonal directions.

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

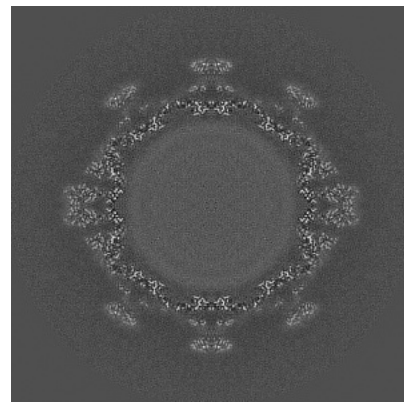
#### 6.2.1 Primary map



X Index: 256



Y Index: 256

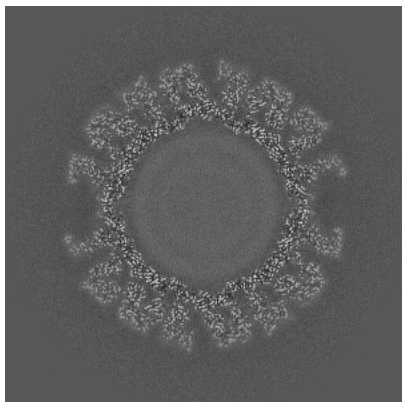


Z Index: 256

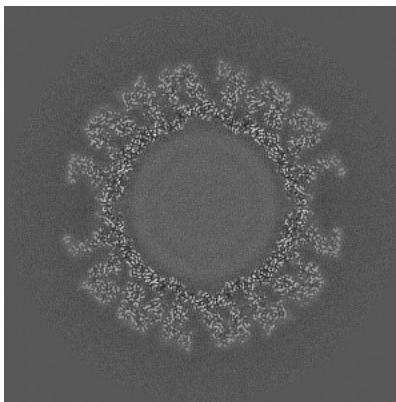
The images above show central slices of the map in three orthogonal directions.

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

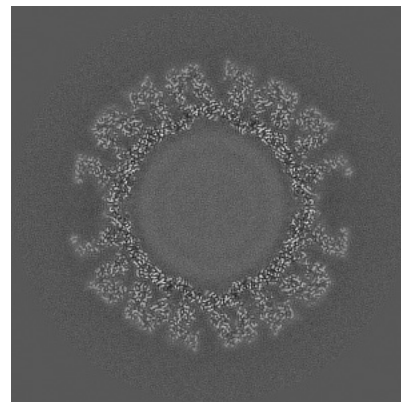
### 6.3.1 Primary map



X Index: 203



Y Index: 203

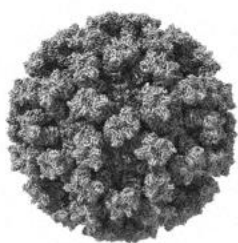


Z Index: 203

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

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

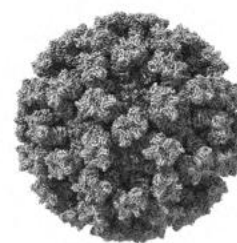
### 6.4.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.05. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

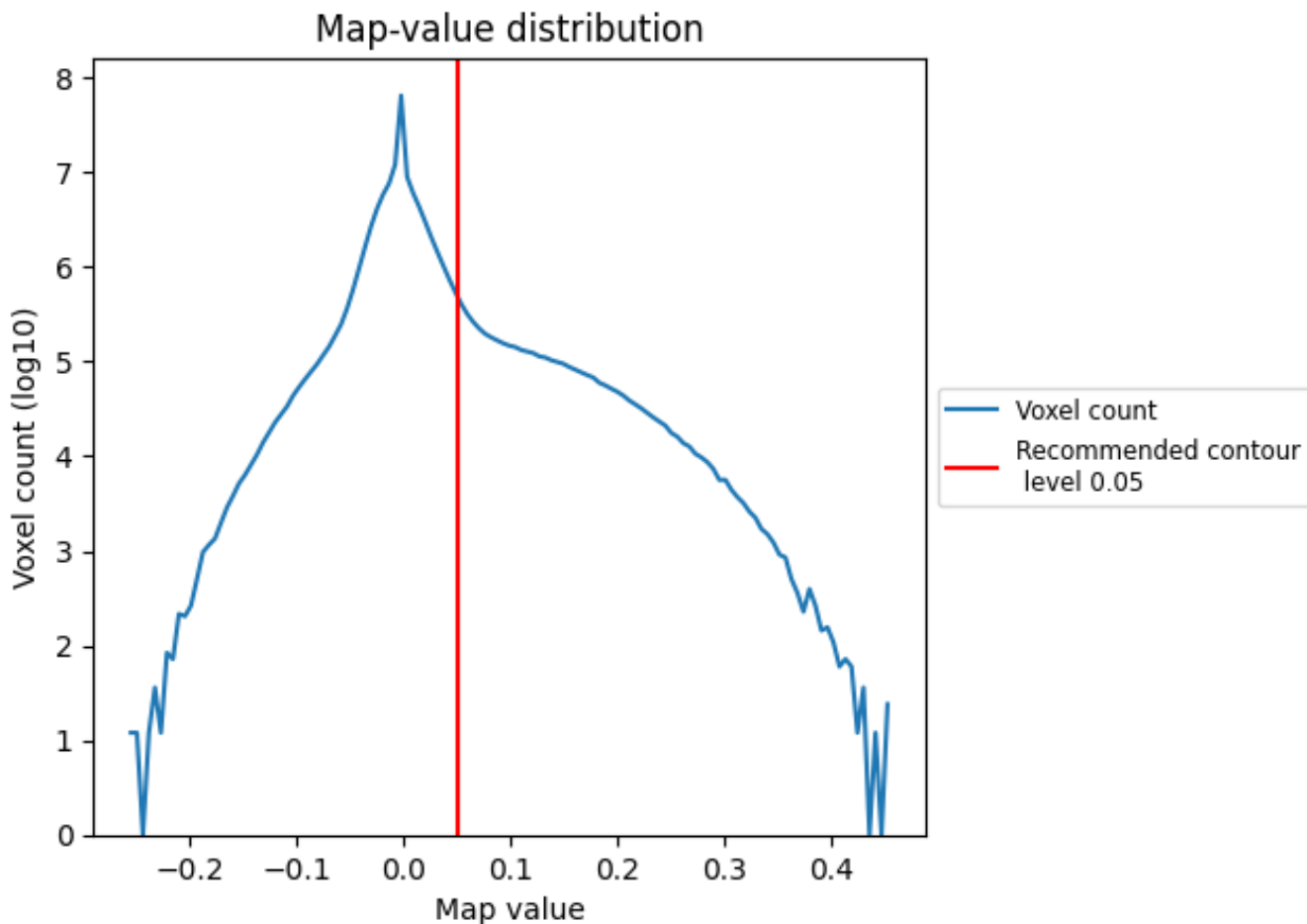
## 6.5 Mask visualisation

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

## 7 Map analysis [i](#)

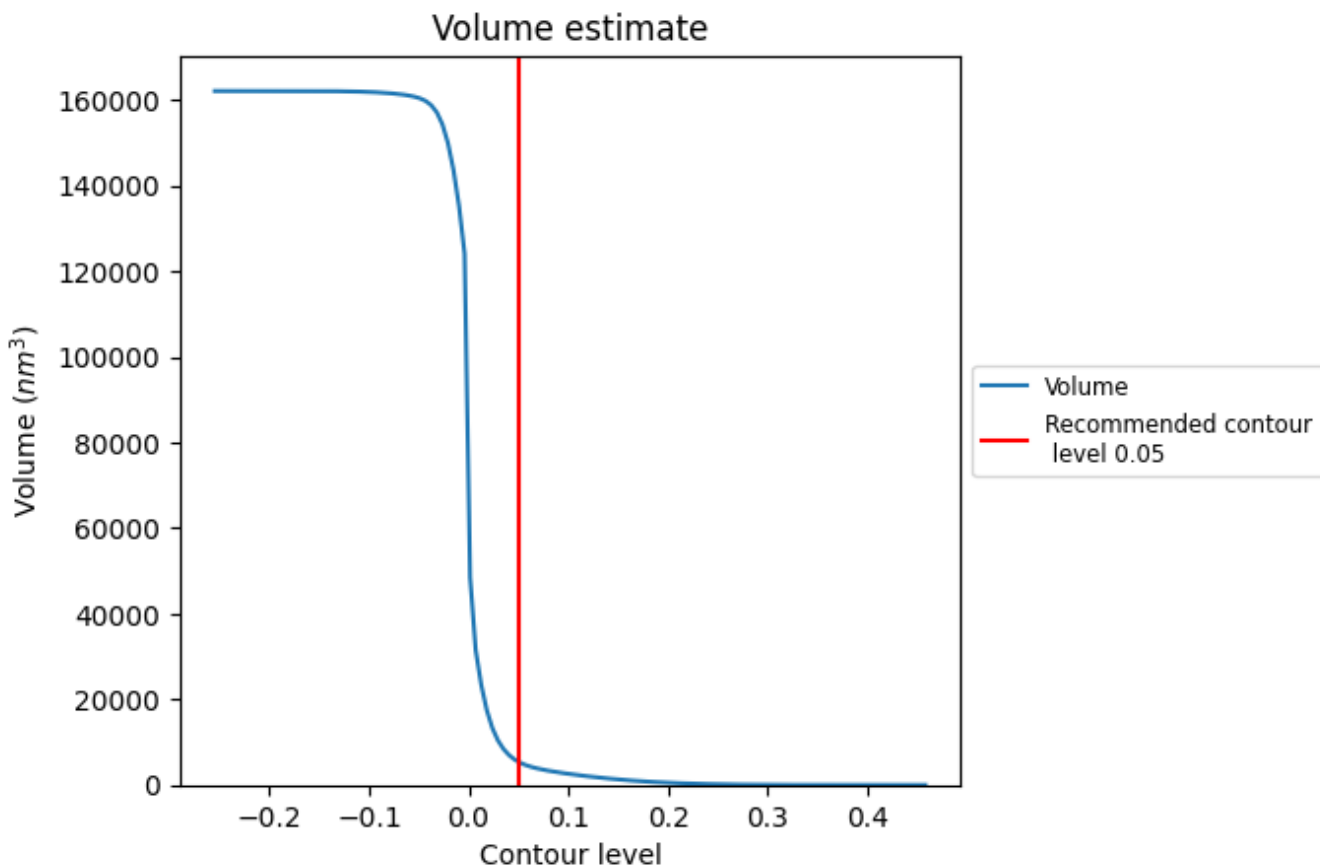
This section contains the results of statistical analysis of the map.

### 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.

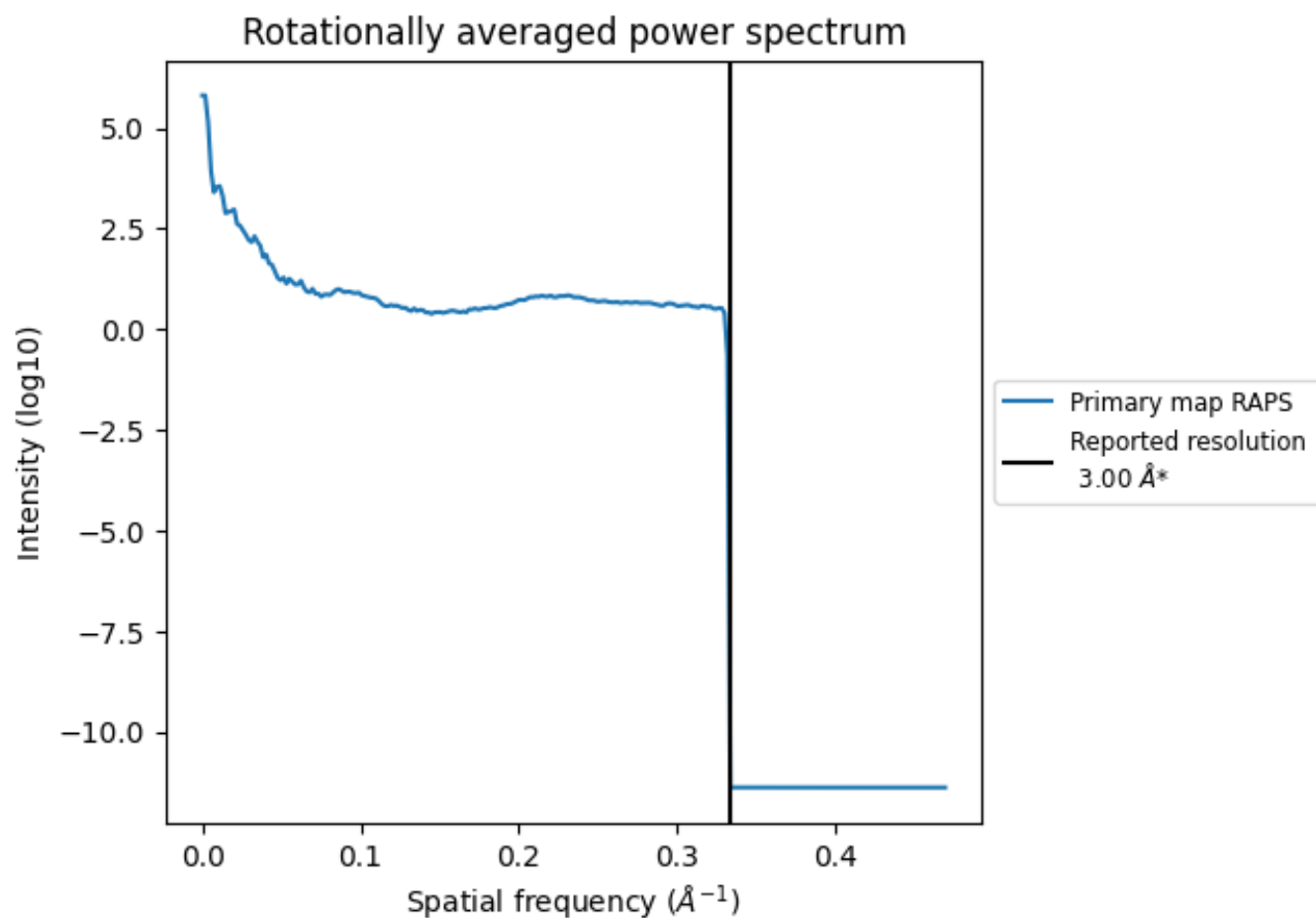
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 5428  $\text{nm}^3$ ; this corresponds to an approximate mass of 4903 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](#)

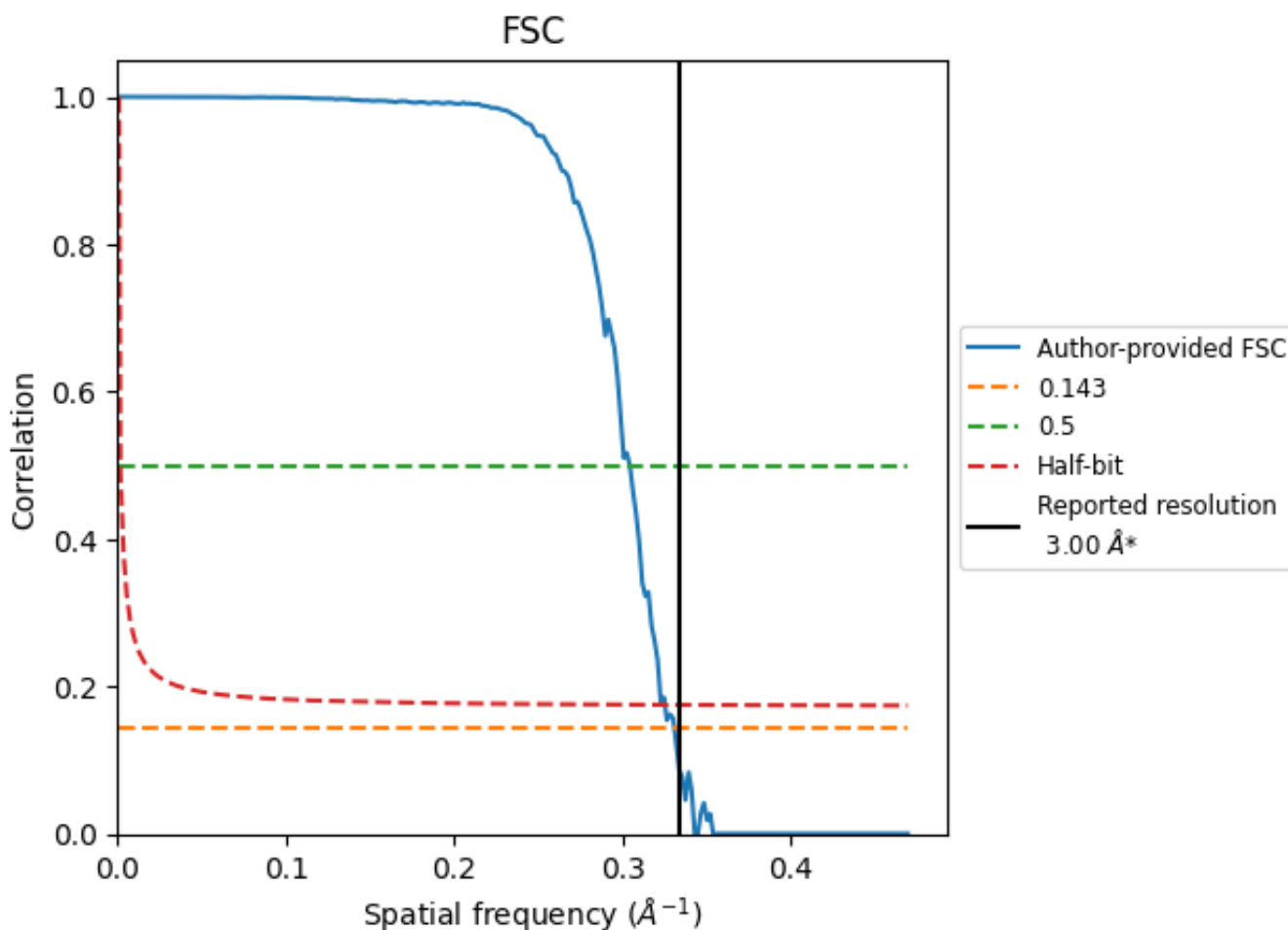


\*Reported resolution corresponds to spatial frequency of  $0.333 \text{ \AA}^{-1}$

## 8 Fourier-Shell correlation [\(i\)](#)

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

### 8.1 FSC [\(i\)](#)



\*Reported resolution corresponds to spatial frequency of 0.333 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	3.00	-	-
Author-provided FSC curve	3.02	3.29	3.08
Unmasked-calculated*	-	-	-

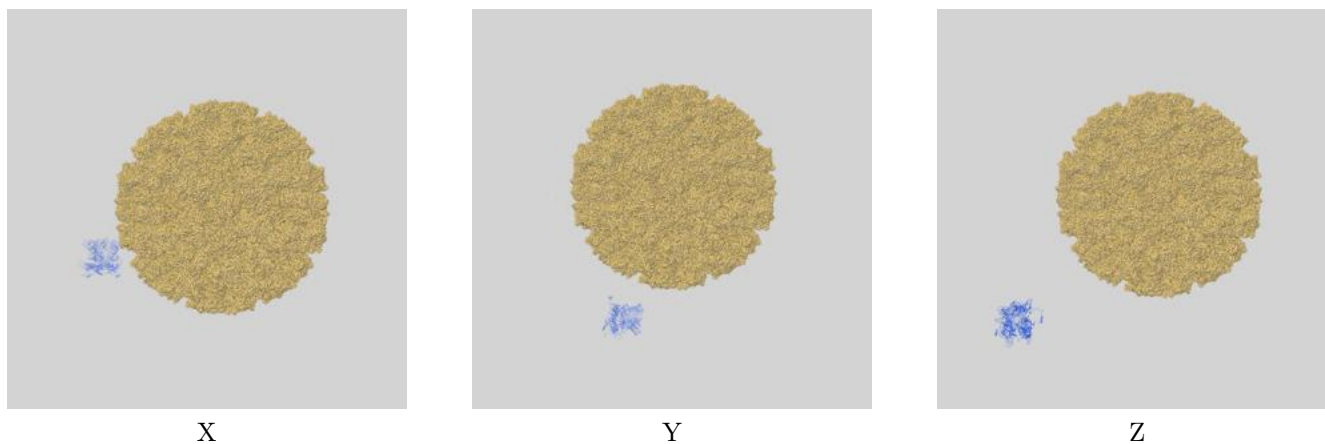
\*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps.

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

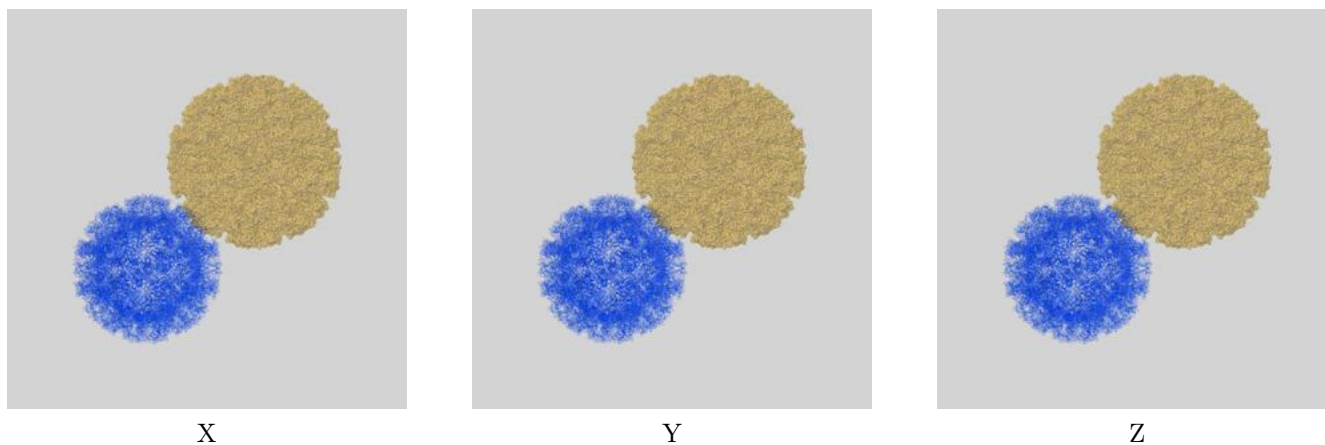
This section contains information regarding the fit between EMDB map EMD-0054 and PDB model 6GSH. Per-residue inclusion information can be found in section 3 on page 8.

### 9.1 Map-model overlays

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

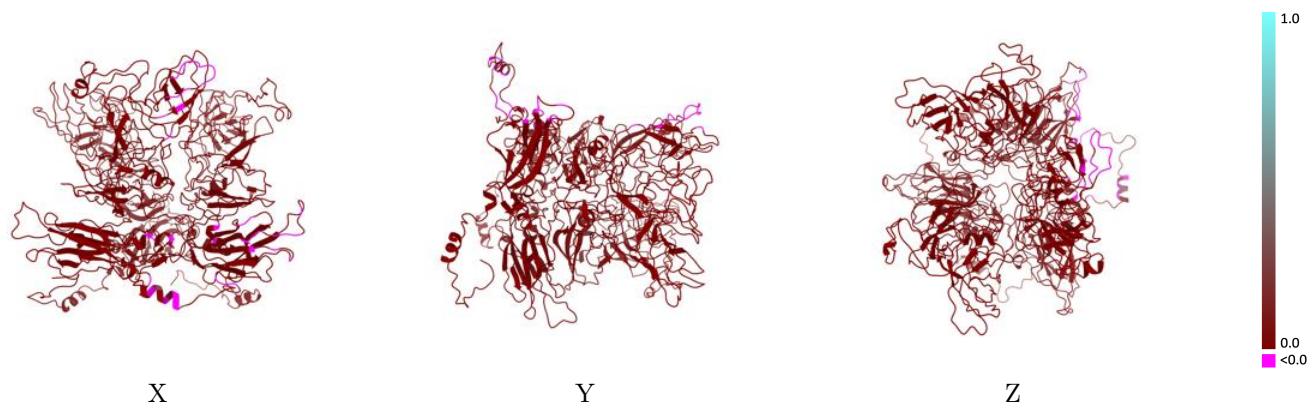


#### 9.1.2 Map-model assembly overlay [i](#)



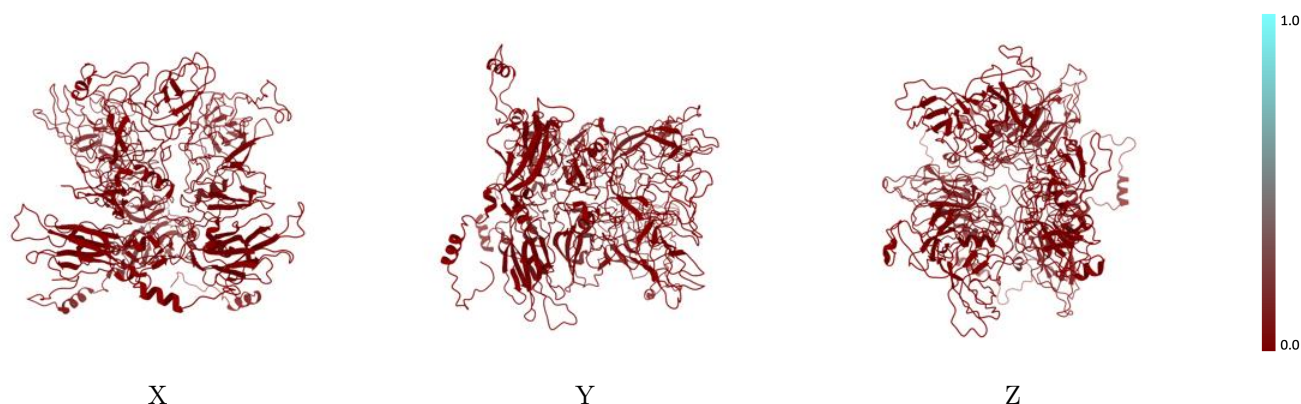
The images above show the 3D surface view of the map at the recommended contour level 0.05 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



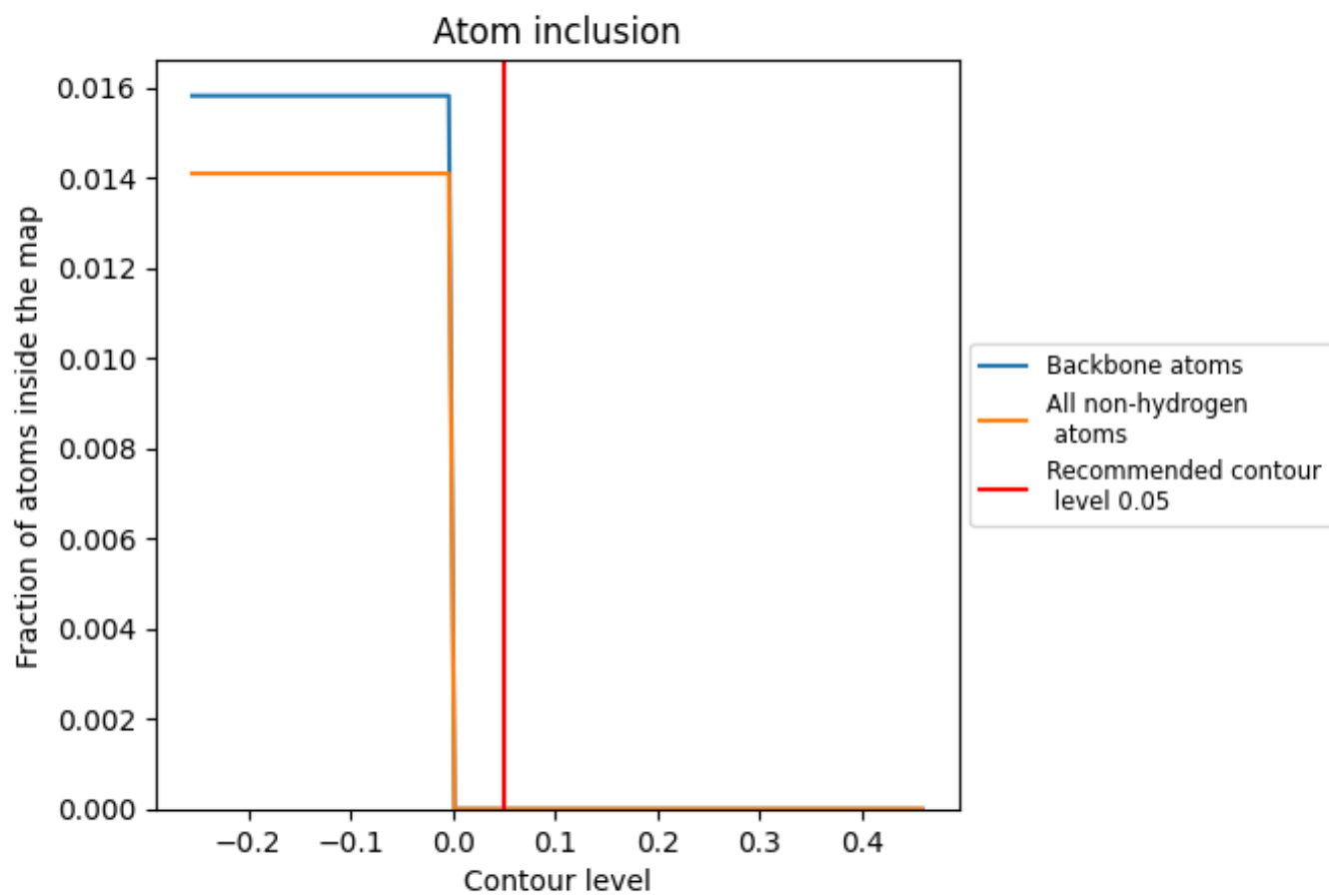
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.05).

## 9.4 Atom inclusion [i](#)



At the recommended contour level, 0% of all backbone atoms, 0% of all non-hydrogen atoms, are inside the map.

## 9.5 Map-model fit summary [i](#)

The table lists the average atom inclusion at the recommended contour level (0.05) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.0000	-0.0000
A	0.0000	0.0000
B	0.0000	-0.0000
C	0.0000	0.0000

