



## Full wwPDB EM Validation Report ⓘ

Dec 19, 2024 – 04:08 PM EST

PDB ID : 9DQD  
EMDB ID : EMD-47111  
Title : cryo-EM structure of human Cereblon/DDB1 in complex with a non-traditional CRBN binder  
Authors : Zhu, J.; Pagarigan, B.  
Deposited on : 2024-09-23  
Resolution : 3.00 Å(reported)  
Based on initial model : 8D81

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.dev113  
Mogul : 2022.3.0, CSD as543be (2022)  
MolProbity : 4.02b-467  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
MapQ : 1.9.13  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.40

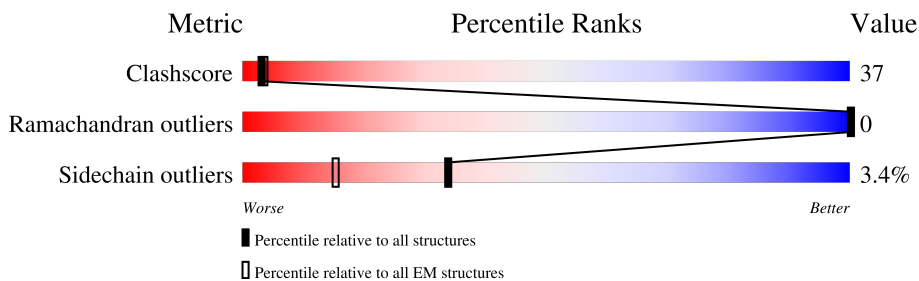
# 1 Overall quality at a glance

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	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  $\geq 3$ , 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	467	
2	B	836	

## 2 Entry composition i

There are 4 unique types of molecules in this entry. The entry contains 9409 atoms, of which 24 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 Protein cereblon.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	373	3010	1922	515	550	23	0	0

There are 25 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-24	MET	-	initiating methionine	UNP Q96SW2
A	-23	SER	-	expression tag	UNP Q96SW2
A	-22	TYR	-	expression tag	UNP Q96SW2
A	-21	TYR	-	expression tag	UNP Q96SW2
A	-20	HIS	-	expression tag	UNP Q96SW2
A	-19	HIS	-	expression tag	UNP Q96SW2
A	-18	HIS	-	expression tag	UNP Q96SW2
A	-17	HIS	-	expression tag	UNP Q96SW2
A	-16	HIS	-	expression tag	UNP Q96SW2
A	-15	HIS	-	expression tag	UNP Q96SW2
A	-14	ASP	-	expression tag	UNP Q96SW2
A	-13	TYR	-	expression tag	UNP Q96SW2
A	-12	ASP	-	expression tag	UNP Q96SW2
A	-11	ILE	-	expression tag	UNP Q96SW2
A	-10	PRO	-	expression tag	UNP Q96SW2
A	-9	THR	-	expression tag	UNP Q96SW2
A	-8	THR	-	expression tag	UNP Q96SW2
A	-7	GLY	-	expression tag	UNP Q96SW2
A	-6	LEU	-	expression tag	UNP Q96SW2
A	-5	VAL	-	expression tag	UNP Q96SW2
A	-4	PRO	-	expression tag	UNP Q96SW2
A	-3	ARG	-	expression tag	UNP Q96SW2
A	-2	GLY	-	expression tag	UNP Q96SW2
A	-1	SER	-	expression tag	UNP Q96SW2
A	0	MET	-	expression tag	UNP Q96SW2

- Molecule 2 is a protein called DNA damage-binding protein 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	808	6349	4027	1069	1219	34	0	0

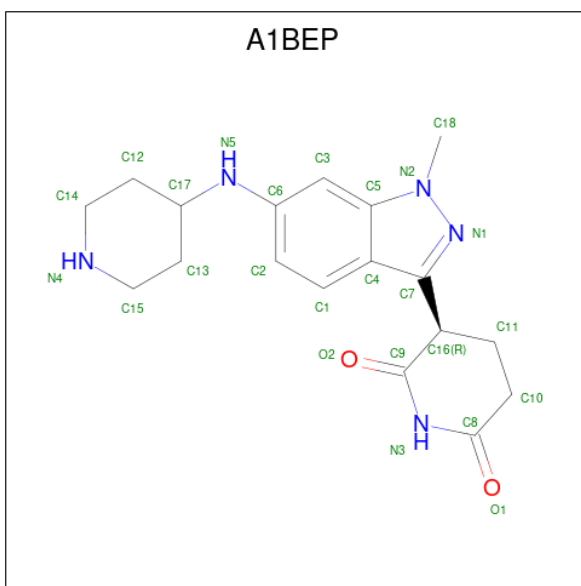
There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	700	GLY	-	linker	UNP Q16531
B	701	ASN	-	linker	UNP Q16531
B	702	GLY	-	linker	UNP Q16531
B	703	ASN	-	linker	UNP Q16531
B	704	SER	-	linker	UNP Q16531
B	705	GLY	-	linker	UNP Q16531

- Molecule 3 is ZINC ION (three-letter code: ZN) (formula: Zn).

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

- Molecule 4 is (3R)-3-{1-methyl-6-[(piperidin-4-yl)amino]-1H-indazol-3-yl}piperidine-2,6-dione (three-letter code: A1BEP) (formula: C<sub>18</sub>H<sub>23</sub>N<sub>5</sub>O<sub>2</sub>) (labeled as "Ligand of Interest" by depositor).

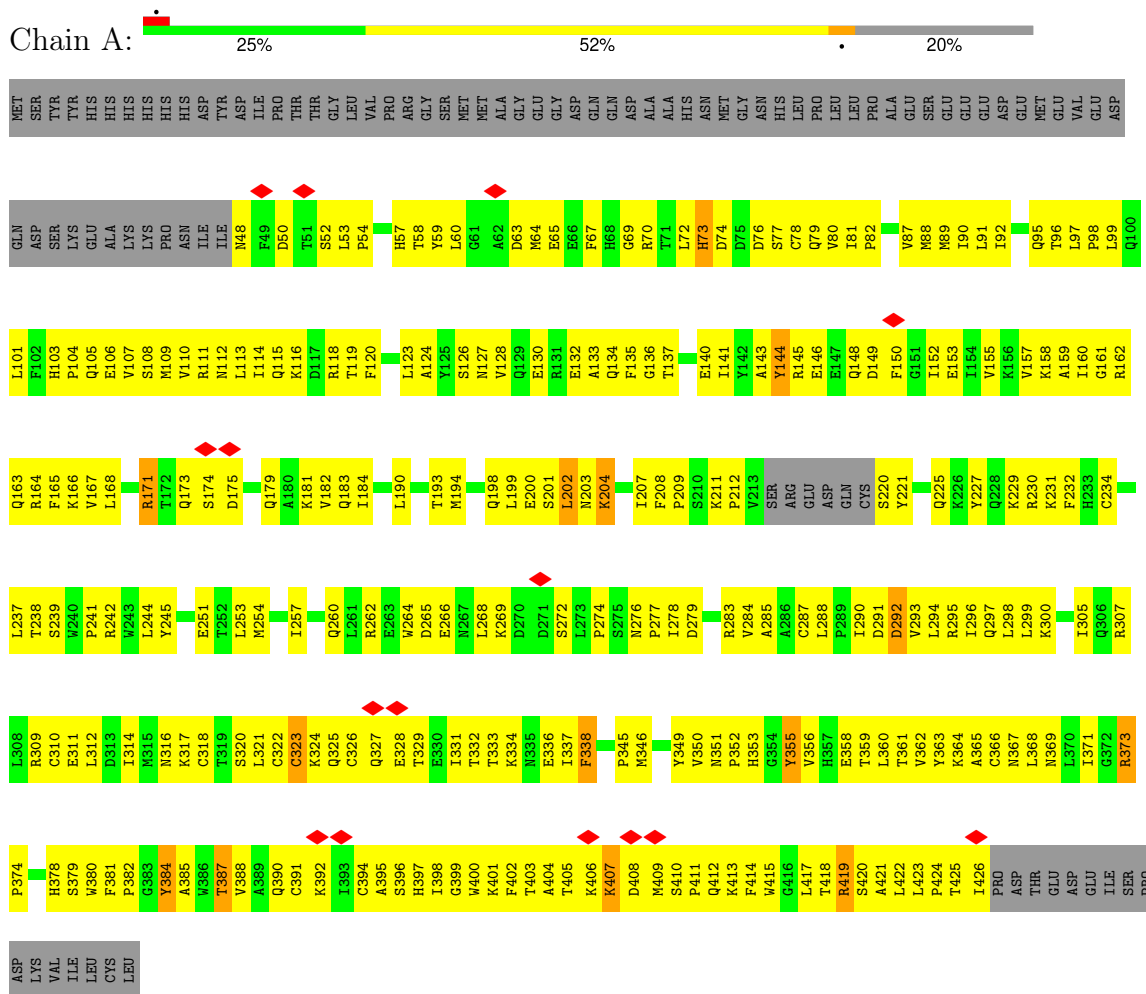


Mol	Chain	Residues	Atoms					AltConf
			Total	C	H	N	O	
4	A	1	49	18	24	5	2	0

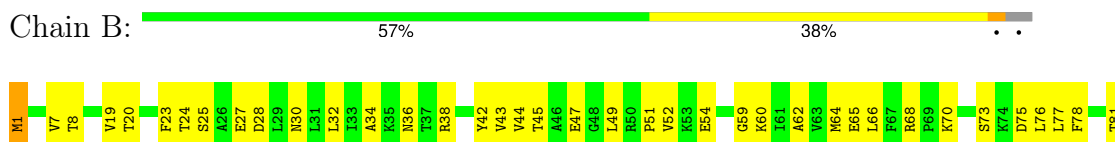
### 3 Residue-property plots

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: Protein cereblon



- Molecule 2: DNA damage-binding protein 1



H1070	H1073	H1074	T1078	E1079	R1080	K1081	T1082	E1083	F1084	A1085	I1089	L1093	I1094	F1097	L1098	D1099	I1100	S1101	R1102	P1103	K1104	M1105	Q1106	E1107	V1108	V1109	A1110	M1111	L1112	Q1113	Y1114	D1115	ASP	GLY	SER	GLY	GLY	MET	K1121	R1122	E1123	A1124	L1129	I1130	V1132	V1133	E1134	E1135	L1136	T1137	R1138	I1139	H1140
Y853	S854	D855	G856	K857	L858	E865	V866	K867	G868	A869	K879	L880	L881	A882	S883	R889	L890	Y891	E892	E896	R900	I909	H910	A911	I921	L922	D925	L926	R927	R928	S929	V930	L931	Y935	K936	P937	M938	E939	G940	N941	F942	E943	A946	F949	W953	E958							
Y859	D962	L966	E969	N970	A971	F972	G973	L974	F975	V976	A983	T984	T985	E988	R989	E1002	V1006	M1014	Q1015	ASN	LEU	GLY	GLU	THR	S1021	P1023	F1030	M1036	I1037	G1038	L1039	V1040	T1041	M1054	N1056	L1058	M1059	K1060	V1061	I1062	K1063	K1067	I1068	E1069									
K769	R770	F771	S772	SER	THR	ALA	PRO	HIS	GLU	T780	S781	E784	E785	V786	E787	N790	I794	D795	Q796	E800	V801	H803	A804	Q809	N810	R811	Y812	L816	K823	T827	V831	G832	T833	A834	M835	E840	A841	P842	K843	K844	Q845	V849	W850	F851	Q852								
D366	R369	S379	G385	R388	I389	I390	E288	G393	ILE	GLY	GLY	GLY	ASN	GLY	ASN	SER	GLY	ILE	GLN	K709	I712	R713	T714	E719	S720	R721	R722	K723	I724	C725	Y726	Q727	E728	V735	R739	I740	E741	V742	Q743	G748	T749	T750	A751	K844	Q845	V849	W850	F851	Q852				
E277	G278	R279	L280	M281	L283	L284	E286	K287	E288	F289	Q290	P291	D292	L297	K298	D299	L300	R301	A214	E215	A216	S217	M218	F226	T232	G233	Q234	E235	T238	D243	K244	A247	I248	A249	P250	P251	I252	K254	T257	V258	C259	F169	N267	G268	S269	R270	G274						
H189	I88	Y91	K92	Q93	S94	G95	E96	D99	T102	D110	R111	E117	T118	G119	I120	I123	I124	D125	P126	E127	M130	I131	G132	L133	R134	L135	Y136	I143	P144	L145	R147	K150	A154	R158	E161	I165	F169	I178	Q183	D184	P185												
H189	V190	K191	T192	S196	L197	R198	E199	K200	E201	F202	G205	K208	Q209	E210	N211	V212	E213	A214	E215	A216	S217	M218	F226	T232	G233	Q234	E235	T238	D243	K244	A247	I248	A249	P250	P251	I252	K254	T257	V258	C259	F169	N267	G268	S269	R270	G274							

## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	81146	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	27.67, 39.28	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	1400	Depositor
Magnification	75000	Depositor
Image detector	FEI FALCON IV (4k x 4k), FEI FALCON IV (4k x 4k)	Depositor
Maximum map value	2.017	Depositor
Minimum map value	-0.994	Depositor
Average map value	-0.004	Depositor
Map value standard deviation	0.064	Depositor
Recommended contour level	0.2	Depositor
Map size ( $\text{\AA}$ )	229.9, 229.9, 229.9	wwPDB
Map dimensions	220, 220, 220	wwPDB
Map angles ( $^\circ$ )	90.0, 90.0, 90.0	wwPDB
Pixel spacing ( $\text{\AA}$ )	1.045, 1.045, 1.045	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, A1BEP

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	0.25	0/3082	0.47	0/4180
2	B	0.27	0/6461	0.49	0/8735
All	All	0.26	0/9543	0.48	0/12915

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

### 5.2 Too-close contacts [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	3010	0	3004	379	0
2	B	6349	0	6321	332	0
3	A	1	0	0	0	0
4	A	25	24	0	3	0
All	All	9385	24	9325	696	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 37.

All (696) 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:B:43:VAL:HG23	2:B:52:VAL:HG21	1.34	1.08
1:A:318:CYS:HA	1:A:426:ILE:HG22	1.34	1.05
1:A:168:LEU:HD11	1:A:181:LYS:HG3	1.42	1.01
2:B:143:ILE:HG12	2:B:154:ALA:HB2	1.39	1.01
1:A:321:LEU:HD11	1:A:422:LEU:HB3	1.39	1.00
1:A:167:VAL:HA	1:A:182:VAL:HG22	1.46	0.97
1:A:362:VAL:HG23	1:A:415:TRP:HB2	1.46	0.96
1:A:413:LYS:HA	1:A:413:LYS:HE2	1.48	0.94
1:A:114:ILE:HD12	1:A:115:GLN:HG3	1.47	0.93
1:A:401:LYS:HE3	1:A:413:LYS:HD3	1.53	0.88
1:A:123:LEU:HD11	1:A:167:VAL:HG11	1.56	0.88
1:A:338:PHE:O	1:A:361:THR:OG1	1.92	0.88
1:A:207:ILE:HG21	2:B:165:ILE:HD12	1.52	0.88
1:A:134:GLN:HB3	1:A:166:LYS:HE2	1.55	0.87
2:B:201:GLU:HG2	2:B:202:PHE:H	1.39	0.87
1:A:103:HIS:HB3	1:A:106:GLU:HG2	1.57	0.85
2:B:27:GLU:N	2:B:27:GLU:OE1	2.10	0.83
1:A:363:TYR:HE2	1:A:411:PRO:HB3	1.43	0.83
1:A:165:PHE:CD1	1:A:182:VAL:HG11	2.14	0.83
2:B:147:ARG:O	2:B:150:LYS:NZ	2.12	0.83
1:A:293:VAL:HG23	1:A:294:LEU:HD22	1.58	0.83
1:A:290:ILE:HD12	1:A:294:LEU:HB3	1.61	0.82
1:A:73:HIS:HE1	1:A:79:GLN:HG2	1.45	0.82
2:B:1100:ILE:HB	2:B:1105:MET:HE3	1.60	0.82
1:A:336:GLU:OE2	1:A:363:TYR:N	2.11	0.82
1:A:123:LEU:HD12	1:A:133:ALA:HB3	1.60	0.82
2:B:270:ARG:HD2	2:B:282:MET:HE3	1.61	0.81
2:B:1114:TYR:HB3	2:B:1124:ALA:HB2	1.62	0.81
1:A:388:VAL:HG22	1:A:400:TRP:HE1	1.46	0.80
2:B:925:ASP:OD1	2:B:926:LEU:N	2.13	0.80
1:A:269:LYS:O	1:A:272:SER:OG	1.97	0.80
1:A:204:LYS:H	1:A:204:LYS:HD3	1.46	0.80
1:A:91:LEU:HD21	1:A:161:GLY:HA3	1.63	0.80
2:B:248:ILE:HD13	2:B:300:LEU:HB2	1.62	0.79
1:A:198:GLN:HG3	1:A:201:SER:OG	1.83	0.79
1:A:251:GLU:N	1:A:251:GLU:OE1	2.16	0.79
1:A:238:THR:HG22	1:A:239:SER:H	1.47	0.79
2:B:118:THR:HB	2:B:134:ARG:HH22	1.48	0.78
2:B:983:ALA:HB1	2:B:988:GLU:HG3	1.62	0.78
2:B:1057:ARG:NH2	2:B:1111:ASN:O	2.16	0.78
1:A:293:VAL:O	1:A:296:ILE:HG22	1.84	0.78
1:A:70:ARG:HA	1:A:70:ARG:NH1	1.99	0.78

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:371:ILE:O	1:A:387:THR:HG23	1.84	0.78
2:B:842:GLU:OE1	2:B:842:GLU:N	2.17	0.77
1:A:166:LYS:O	1:A:182:VAL:HG13	1.84	0.77
1:A:80:VAL:HB	1:A:181:LYS:HE2	1.66	0.77
2:B:1097:PHE:HD1	2:B:1098:LEU:HD12	1.50	0.77
1:A:143:ALA:HB3	1:A:158:LYS:HB2	1.66	0.76
1:A:59:TYR:CE2	1:A:60:LEU:HG	2.20	0.76
2:B:38:ARG:NH2	2:B:54:GLU:OE2	2.17	0.76
2:B:983:ALA:HB1	2:B:988:GLU:CG	2.15	0.76
2:B:161:GLU:OE1	2:B:161:GLU:N	2.19	0.76
2:B:1055:GLN:HG3	2:B:1093:LEU:HD23	1.65	0.76
2:B:857:LYS:HD3	2:B:858:LEU:H	1.52	0.74
1:A:101:LEU:HB2	1:A:155:VAL:CG2	2.17	0.74
2:B:369:ARG:HA	2:B:369:ARG:NH1	2.02	0.74
1:A:81:ILE:HG23	1:A:82:PRO:HD2	1.67	0.74
1:A:48:ASN:ND2	1:A:409:MET:O	2.18	0.74
2:B:883:SER:OG	2:B:911:ALA:HB3	1.88	0.74
1:A:365:ALA:HB1	1:A:368:LEU:HD22	1.68	0.73
2:B:117:GLU:N	2:B:117:GLU:OE1	2.21	0.73
2:B:270:ARG:HG2	2:B:284:LEU:HD23	1.70	0.73
1:A:118:ARG:NE	1:A:141:ILE:O	2.22	0.73
1:A:109:MET:HE3	1:A:113:LEU:HB2	1.69	0.73
1:A:363:TYR:CE2	1:A:411:PRO:HB3	2.24	0.73
1:A:118:ARG:HG2	1:A:141:ILE:HB	1.71	0.72
2:B:250:PRO:HB2	2:B:253:ILE:HD13	1.71	0.72
2:B:936:LYS:HD3	2:B:943:GLU:HG2	1.70	0.72
2:B:1054:MET:HE3	2:B:1054:MET:N	2.04	0.72
1:A:360:LEU:HD21	1:A:417:LEU:HB2	1.70	0.72
1:A:57:HIS:CE1	1:A:98:PRO:HG3	2.25	0.71
1:A:135:PHE:CE2	1:A:300:LYS:HG2	2.24	0.71
2:B:1094:ILE:O	2:B:1097:PHE:HB3	1.90	0.71
2:B:892:GLU:OE2	2:B:900:ARG:NH2	2.23	0.71
2:B:267:ASN:OD1	2:B:269:SER:OG	2.07	0.71
2:B:36:ASN:ND2	2:B:1002:GLU:OE2	2.23	0.71
1:A:307:ARG:O	1:A:311:GLU:HG3	1.90	0.71
1:A:388:VAL:HA	1:A:400:TRP:HD1	1.56	0.71
2:B:301:ARG:NH2	2:B:303:GLU:OE2	2.24	0.71
2:B:1100:ILE:HB	2:B:1105:MET:CE	2.20	0.71
2:B:1114:TYR:HB3	2:B:1124:ALA:CB	2.21	0.71
2:B:213:GLU:OE2	2:B:215:GLU:HB2	1.90	0.71
2:B:341:ASN:ND2	2:B:343:GLN:OE1	2.24	0.71

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:149:ASP:OD1	1:A:152:ILE:HB	1.89	0.71
1:A:82:PRO:HG3	1:A:109:MET:HE1	1.72	0.70
1:A:171:ARG:HD2	1:A:179:GLN:HB2	1.72	0.70
1:A:321:LEU:HD21	1:A:422:LEU:HG	1.72	0.70
1:A:418:THR:O	1:A:422:LEU:HD13	1.91	0.70
1:A:207:ILE:HG21	2:B:165:ILE:CD1	2.19	0.70
1:A:317:LYS:NZ	1:A:317:LYS:O	2.25	0.70
2:B:252:ILE:HG13	2:B:253:ILE:HD12	1.74	0.70
1:A:373:ARG:NE	1:A:374:PRO:O	2.24	0.70
1:A:266:GLU:N	1:A:266:GLU:OE1	2.24	0.70
2:B:277:GLU:OE1	2:B:279:ARG:NH2	2.25	0.70
1:A:113:LEU:HD11	1:A:119:THR:O	1.92	0.70
2:B:1078:THR:HG22	2:B:1081:LYS:O	1.92	0.69
1:A:324:LYS:HD2	1:A:420:SER:O	1.92	0.69
1:A:401:LYS:HZ1	1:A:413:LYS:HA	1.57	0.69
2:B:34:ALA:HB2	2:B:64:MET:CE	2.22	0.69
1:A:404:ALA:HB3	1:A:412:GLN:OE1	1.93	0.69
2:B:124:ILE:HG12	2:B:131:ILE:HG13	1.73	0.69
1:A:403:THR:HA	1:A:412:GLN:O	1.93	0.69
2:B:743:GLN:OE1	2:B:748:GLY:N	2.22	0.69
1:A:171:ARG:HH21	1:A:173:GLN:HA	1.58	0.68
1:A:291:ASP:OD1	1:A:294:LEU:HD23	1.94	0.68
1:A:401:LYS:NZ	1:A:402:PHE:O	2.27	0.68
2:B:47:GLU:OE1	2:B:47:GLU:N	2.26	0.68
2:B:290:GLN:N	2:B:290:GLN:OE1	2.27	0.68
2:B:111:ARG:HA	2:B:111:ARG:NH1	2.09	0.68
2:B:984:THR:OG1	2:B:988:GLU:OE2	2.06	0.68
1:A:384:TYR:CD1	1:A:402:PHE:HB3	2.29	0.68
2:B:213:GLU:HG2	2:B:214:ALA:N	2.09	0.68
1:A:53:LEU:HB3	1:A:54:PRO:HD3	1.76	0.67
1:A:290:ILE:HD12	1:A:294:LEU:CB	2.23	0.67
2:B:96:GLU:N	2:B:96:GLU:OE1	2.26	0.67
2:B:1030:PHE:CZ	2:B:1038:GLY:HA3	2.29	0.67
1:A:114:ILE:CD1	1:A:115:GLN:HG3	2.23	0.67
1:A:345:PRO:O	1:A:360:LEU:HA	1.95	0.67
1:A:369:ASN:OD1	1:A:392:LYS:HA	1.95	0.67
1:A:82:PRO:HG3	1:A:109:MET:CE	2.25	0.67
1:A:207:ILE:HD13	2:B:165:ILE:HD11	1.76	0.67
2:B:111:ARG:HA	2:B:111:ARG:CZ	2.23	0.67
1:A:63:ASP:O	1:A:145:ARG:NH1	2.27	0.67
1:A:143:ALA:HB2	1:A:158:LYS:HZ2	1.59	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:358:GLU:OE2	1:A:419:ARG:N	2.28	0.67
1:A:81:ILE:CG2	1:A:120:PHE:HA	2.25	0.67
1:A:135:PHE:CE1	1:A:166:LYS:HG2	2.30	0.66
1:A:89:MET:HE1	1:A:97:LEU:HD22	1.77	0.66
1:A:360:LEU:HD23	1:A:360:LEU:H	1.61	0.66
1:A:168:LEU:HG	1:A:182:VAL:HA	1.78	0.66
1:A:388:VAL:HA	1:A:400:TRP:CD1	2.30	0.66
2:B:769:LYS:O	2:B:769:LYS:HG2	1.94	0.66
1:A:321:LEU:HD23	1:A:322:CYS:N	2.11	0.65
2:B:1058:LEU:O	2:B:1062:ILE:HG23	1.96	0.65
1:A:294:LEU:O	1:A:298:LEU:HD13	1.97	0.65
1:A:401:LYS:NZ	1:A:414:PHE:H	1.94	0.65
2:B:65:GLU:O	2:B:77:LEU:HD12	1.97	0.65
2:B:1103:PRO:O	2:B:1107:GLU:HG3	1.95	0.65
1:A:91:LEU:HG	1:A:95:GLN:HE21	1.62	0.65
2:B:132:GLY:O	2:B:133:LEU:HD12	1.96	0.65
2:B:356:LEU:HD21	2:B:712:ILE:HD13	1.79	0.65
2:B:1061:VAL:HG11	2:B:1108:VAL:HG22	1.78	0.65
2:B:250:PRO:CG	2:B:253:ILE:HD13	2.26	0.64
1:A:260:GLN:NE2	1:A:316:ASN:OD1	2.31	0.64
2:B:1078:THR:HG21	2:B:1080:ARG:HH21	1.60	0.64
1:A:168:LEU:HD11	1:A:181:LYS:CG	2.24	0.64
2:B:131:ILE:HD13	2:B:145:LEU:HD21	1.77	0.64
2:B:896:GLU:N	2:B:896:GLU:OE1	2.31	0.64
1:A:293:VAL:O	1:A:297:GLN:HG3	1.96	0.64
1:A:359:THR:HA	1:A:417:LEU:O	1.96	0.64
1:A:221:TYR:O	1:A:225:GLN:HG2	1.98	0.64
2:B:879:LYS:HB2	2:B:890:LEU:HD21	1.80	0.64
2:B:1098:LEU:HD11	2:B:1133:VAL:HG11	1.80	0.64
2:B:1098:LEU:HD11	2:B:1133:VAL:CG1	2.28	0.64
1:A:166:LYS:HD3	1:A:166:LYS:C	2.19	0.63
2:B:771:PHE:O	2:B:772:SER:OG	2.16	0.63
1:A:67:PHE:CE2	1:A:144:TYR:HB3	2.33	0.63
1:A:134:GLN:N	1:A:134:GLN:OE1	2.31	0.63
2:B:196:SER:OG	2:B:199:GLU:HG2	1.97	0.63
2:B:770:LEU:CD2	2:B:865:GLU:HB2	2.28	0.63
1:A:73:HIS:CE1	1:A:79:GLN:HG2	2.32	0.63
1:A:321:LEU:HD11	1:A:422:LEU:CB	2.25	0.63
2:B:201:GLU:HG2	2:B:202:PHE:N	2.10	0.63
2:B:1113:GLN:CD	2:B:1121:LYS:HB3	2.19	0.62
2:B:1122:ARG:HG3	2:B:1124:ALA:H	1.64	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:388:VAL:HG13	1:A:397:HIS:CE1	2.35	0.62
1:A:78:CYS:SG	1:A:181:LYS:HD2	2.40	0.62
1:A:67:PHE:CZ	1:A:144:TYR:HB3	2.35	0.62
1:A:103:HIS:ND1	1:A:105:GLN:HG2	2.15	0.62
2:B:985:THR:CG2	2:B:988:GLU:HG2	2.29	0.62
1:A:76:ASP:OD1	1:A:183:GLN:NE2	2.33	0.62
1:A:173:GLN:NE2	1:A:175:ASP:HB2	2.15	0.62
1:A:257:ILE:HD13	1:A:312:LEU:HD13	1.82	0.62
2:B:985:THR:HG23	2:B:988:GLU:HG2	1.81	0.62
2:B:1129:LEU:O	2:B:1132:VAL:HG12	1.99	0.62
1:A:113:LEU:HD23	1:A:118:ARG:HA	1.81	0.62
1:A:127:ASN:HB3	1:A:130:GLU:OE2	2.00	0.62
1:A:164:ARG:HD2	1:A:299:LEU:HD23	1.82	0.62
2:B:250:PRO:HG2	2:B:253:ILE:HD13	1.81	0.62
2:B:939:GLU:OE1	2:B:941:ASN:HB2	2.00	0.61
2:B:1058:LEU:HA	2:B:1061:VAL:HG12	1.82	0.61
2:B:1061:VAL:HG11	2:B:1108:VAL:CG2	2.30	0.61
1:A:53:LEU:HD11	1:A:382:PRO:HG2	1.81	0.61
1:A:371:ILE:HG13	1:A:388:VAL:HB	1.81	0.61
2:B:1039:LEU:HD21	2:B:1041:THR:HG23	1.83	0.61
2:B:118:THR:HB	2:B:134:ARG:NH2	2.14	0.61
2:B:143:ILE:CG1	2:B:154:ALA:HB2	2.24	0.61
2:B:1055:GLN:HG3	2:B:1093:LEU:CD2	2.30	0.61
1:A:171:ARG:CD	1:A:179:GLN:HB2	2.30	0.61
1:A:118:ARG:HB3	1:A:140:GLU:OE2	2.01	0.61
1:A:53:LEU:HG	1:A:382:PRO:HD2	1.82	0.61
2:B:250:PRO:CB	2:B:253:ILE:HD13	2.30	0.61
1:A:298:LEU:HD11	1:A:314:ILE:CD1	2.30	0.60
2:B:362:MET:HG2	2:B:1006:VAL:HG11	1.83	0.60
1:A:167:VAL:HA	1:A:182:VAL:CG2	2.25	0.60
1:A:200:GLU:HA	1:A:203:ASN:OD1	2.01	0.60
2:B:333:LEU:O	2:B:350:MET:HB2	2.01	0.60
2:B:1054:MET:HE3	2:B:1054:MET:CA	2.32	0.60
1:A:171:ARG:NH2	1:A:173:GLN:HA	2.16	0.60
2:B:929:SER:HB3	2:B:949:PHE:CE1	2.36	0.60
2:B:770:LEU:HD23	2:B:865:GLU:HB2	1.81	0.60
1:A:321:LEU:CD1	1:A:422:LEU:HB3	2.25	0.60
1:A:423:LEU:HD22	1:A:424:PRO:HD2	1.84	0.60
2:B:110:ASP:HB2	2:B:136:TYR:CE2	2.37	0.60
1:A:107:VAL:O	1:A:110:VAL:HG22	2.01	0.60
1:A:202:LEU:HD12	1:A:202:LEU:O	2.02	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:1002:GLU:HG3	2:B:1036:MET:SD	2.42	0.60
1:A:113:LEU:CD2	1:A:118:ARG:HA	2.32	0.60
1:A:241:PRO:HB3	2:B:812:TYR:CZ	2.37	0.60
1:A:166:LYS:HD3	1:A:167:VAL:N	2.17	0.59
1:A:232:PHE:HB2	1:A:242:ARG:HG2	1.83	0.59
2:B:299:ASP:O	2:B:300:LEU:HD23	2.02	0.59
1:A:70:ARG:HA	1:A:70:ARG:CZ	2.32	0.59
1:A:408:ASP:OD1	1:A:409:MET:N	2.34	0.59
1:A:200:GLU:HG2	1:A:203:ASN:OD1	2.02	0.59
2:B:102:THR:HG21	2:B:1067:LYS:HG3	1.85	0.59
1:A:107:VAL:HG23	1:A:111:ARG:NH2	2.17	0.59
2:B:68:ARG:NH1	2:B:73:SER:O	2.36	0.59
1:A:103:HIS:O	1:A:107:VAL:HG13	2.03	0.59
1:A:133:ALA:O	1:A:167:VAL:HG21	2.03	0.59
1:A:53:LEU:HD21	1:A:382:PRO:HB2	1.84	0.59
1:A:160:ILE:HD11	1:A:162:ARG:NE	2.18	0.59
1:A:265:ASP:OD2	1:A:268:LEU:HG	2.03	0.59
1:A:149:ASP:O	1:A:150:PHE:HB2	2.03	0.59
1:A:328:GLU:HG2	1:A:328:GLU:O	2.01	0.59
2:B:1122:ARG:CG	2:B:1124:ALA:H	2.16	0.59
2:B:131:ILE:CD1	2:B:145:LEU:HD11	2.33	0.58
1:A:298:LEU:HD11	1:A:314:ILE:HD11	1.85	0.58
1:A:202:LEU:HA	1:A:204:LYS:NZ	2.18	0.58
1:A:361:THR:HG22	1:A:414:PHE:HZ	1.69	0.58
2:B:123:ILE:HD13	2:B:169:PHE:CE2	2.38	0.58
2:B:158:ARG:HB3	2:B:158:ARG:NH1	2.19	0.58
2:B:235:GLU:OE1	2:B:235:GLU:N	2.35	0.58
1:A:78:CYS:SG	1:A:168:LEU:HD21	2.44	0.58
1:A:143:ALA:CB	1:A:158:LYS:HB2	2.33	0.58
1:A:207:ILE:HD13	2:B:165:ILE:CD1	2.33	0.58
1:A:362:VAL:CG2	1:A:415:TRP:HB2	2.26	0.58
1:A:60:LEU:HD11	1:A:350:VAL:CG1	2.33	0.58
1:A:305:ILE:O	1:A:309:ARG:HG3	2.04	0.58
1:A:358:GLU:OE1	1:A:358:GLU:N	2.33	0.58
1:A:374:PRO:HB3	1:A:385:ALA:HB1	1.84	0.58
1:A:423:LEU:HD22	1:A:424:PRO:CD	2.34	0.58
2:B:889:ARG:HD2	2:B:891:TYR:OH	2.04	0.58
1:A:173:GLN:HE22	1:A:175:ASP:HB2	1.68	0.58
1:A:350:VAL:HG23	1:A:356:VAL:HG12	1.84	0.57
2:B:780:THR:HB	2:B:784:GLU:OE2	2.04	0.57
1:A:81:ILE:HG21	1:A:120:PHE:HA	1.83	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:134:GLN:HA	1:A:167:VAL:HG22	1.86	0.57
1:A:241:PRO:HB3	2:B:812:TYR:OH	2.04	0.57
2:B:835:MET:HB3	2:B:845:GLN:HG3	1.85	0.57
1:A:109:MET:CE	1:A:113:LEU:HB2	2.35	0.57
2:B:958:GLU:OE1	2:B:959:ILE:N	2.30	0.57
2:B:70:LYS:HE2	2:B:70:LYS:N	2.20	0.57
2:B:1101:SER:OG	2:B:1103:PRO:HD2	2.05	0.56
1:A:203:ASN:HB3	2:B:118:THR:O	2.06	0.56
2:B:30:ASN:ND2	2:B:43:VAL:HG22	2.20	0.56
2:B:984:THR:O	2:B:989:ARG:NH1	2.38	0.56
1:A:79:GLN:HA	1:A:181:LYS:HZ2	1.70	0.56
1:A:81:ILE:CG2	1:A:82:PRO:HD2	2.35	0.56
1:A:227:TYR:CZ	1:A:231:LYS:HD2	2.40	0.56
1:A:274:PRO:HD3	1:A:283:ARG:CZ	2.35	0.56
1:A:274:PRO:HD3	1:A:283:ARG:NH2	2.21	0.56
1:A:384:TYR:CE1	1:A:402:PHE:HB3	2.40	0.56
2:B:198:ARG:CD	2:B:198:ARG:H	2.19	0.56
1:A:165:PHE:HB2	1:A:182:VAL:CG1	2.36	0.56
2:B:1134:GLU:HA	2:B:1137:THR:HG22	1.87	0.56
1:A:265:ASP:CG	1:A:268:LEU:HG	2.26	0.56
2:B:739:ARG:NH1	2:B:757:SER:HG	2.03	0.56
2:B:970:ASN:OD1	2:B:971:ALA:N	2.39	0.56
1:A:265:ASP:HB3	1:A:268:LEU:HG	1.87	0.56
1:A:380:TRP:HH2	1:A:400:TRP:CZ3	2.23	0.56
1:A:208:PHE:HE1	1:A:230:ARG:HD2	1.71	0.56
1:A:390:GLN:HG2	1:A:397:HIS:HA	1.88	0.56
2:B:19:VAL:CG2	2:B:66:LEU:HD12	2.35	0.56
2:B:369:ARG:HA	2:B:369:ARG:HH11	1.69	0.56
1:A:165:PHE:HB2	1:A:182:VAL:HG12	1.87	0.55
1:A:103:HIS:CG	1:A:104:PRO:HD2	2.41	0.55
1:A:91:LEU:HA	1:A:95:GLN:NE2	2.20	0.55
2:B:727:GLN:HE21	2:B:827:THR:CG2	2.20	0.55
1:A:70:ARG:NH1	1:A:140:GLU:HG3	2.22	0.55
1:A:317:LYS:NZ	1:A:426:ILE:HB	2.21	0.55
2:B:19:VAL:HG22	2:B:66:LEU:HD12	1.88	0.55
2:B:30:ASN:HD21	2:B:43:VAL:HG22	1.70	0.55
1:A:373:ARG:HB2	1:A:374:PRO:HD2	1.88	0.55
2:B:366:ASP:O	2:B:369:ARG:NH1	2.39	0.55
1:A:208:PHE:CE1	1:A:230:ARG:HD2	2.42	0.55
2:B:125:ASP:OD1	2:B:126:PRO:HD2	2.06	0.55
2:B:727:GLN:HE21	2:B:827:THR:HB	1.72	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:352:PRO:HD2	4:A:502:A1BEP:O2	2.07	0.55
2:B:1074:ARG:O	2:B:1085:ALA:HB2	2.06	0.55
2:B:1100:ILE:N	2:B:1100:ILE:HD12	2.22	0.55
2:B:1134:GLU:O	2:B:1137:THR:HG22	2.07	0.54
1:A:326:CYS:O	1:A:327:GLN:HB2	2.05	0.54
1:A:410:SER:HB2	1:A:411:PRO:HD2	1.90	0.54
2:B:251:PRO:O	2:B:254:LYS:HG2	2.06	0.54
2:B:335:LYS:HB2	2:B:350:MET:SD	2.48	0.54
1:A:101:LEU:HB2	1:A:155:VAL:HG22	1.90	0.54
1:A:401:LYS:HD3	1:A:415:TRP:CZ2	2.42	0.54
2:B:742:VAL:CG1	2:B:750:THR:HG23	2.37	0.54
2:B:1136:LEU:O	2:B:1139:ILE:HG23	2.08	0.54
1:A:58:THR:HG21	1:A:382:PRO:HG3	1.88	0.54
1:A:70:ARG:NH2	1:A:140:GLU:HG3	2.22	0.54
1:A:402:PHE:HB2	1:A:414:PHE:HB3	1.89	0.54
2:B:75:ASP:O	2:B:76:LEU:HD23	2.07	0.54
2:B:192:THR:OG1	2:B:205:GLY:HA3	2.07	0.54
2:B:34:ALA:HB2	2:B:64:MET:HE1	1.89	0.54
2:B:196:SER:CB	2:B:199:GLU:HG2	2.38	0.54
2:B:283:LEU:HD12	2:B:301:ARG:O	2.08	0.54
1:A:108:SER:HA	1:A:111:ARG:HE	1.72	0.54
1:A:229:LYS:HD2	1:A:229:LYS:O	2.07	0.54
2:B:314:LEU:CD2	2:B:324:VAL:HG22	2.38	0.54
2:B:741:GLU:HG2	2:B:751:ALA:HA	1.90	0.54
1:A:324:LYS:O	1:A:327:GLN:NE2	2.41	0.53
2:B:1014:MET:SD	2:B:1015:GLN:HG3	2.47	0.53
2:B:1059:ASN:HD21	2:B:1070:HIS:CG	2.25	0.53
1:A:60:LEU:HD11	1:A:350:VAL:HG11	1.88	0.53
1:A:148:GLN:HE22	1:A:153:GLU:HG3	1.72	0.53
1:A:351:ASN:OD1	1:A:352:PRO:HD2	2.09	0.53
1:A:103:HIS:HB3	1:A:106:GLU:CG	2.33	0.53
1:A:401:LYS:HD3	1:A:415:TRP:CE2	2.43	0.53
2:B:1:MET:SD	2:B:1:MET:N	2.72	0.53
2:B:23:PHE:CE2	2:B:91:TYR:HB2	2.43	0.53
1:A:321:LEU:HD21	1:A:422:LEU:CG	2.38	0.53
1:A:365:ALA:CB	1:A:368:LEU:HD22	2.36	0.53
1:A:65:GLU:HG2	1:A:67:PHE:CE1	2.43	0.53
1:A:79:GLN:C	1:A:181:LYS:HD3	2.28	0.53
1:A:391:CYS:O	1:A:395:ALA:HA	2.09	0.53
2:B:235:GLU:HB3	2:B:254:LYS:NZ	2.23	0.53
2:B:743:GLN:HG2	2:B:781:SER:O	2.08	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:110:VAL:O	1:A:114:ILE:HG23	2.09	0.53
2:B:235:GLU:O	2:B:254:LYS:NZ	2.42	0.53
2:B:1061:VAL:HG13	2:B:1062:ILE:H	1.74	0.53
1:A:88:MET:HE1	1:A:128:VAL:HA	1.91	0.53
1:A:209:PRO:HA	2:B:183:GLN:HE22	1.74	0.53
1:A:421:ALA:C	1:A:422:LEU:HD12	2.30	0.53
1:A:321:LEU:HD21	1:A:422:LEU:CB	2.39	0.52
2:B:953:TRP:HB2	2:B:970:ASN:HB2	1.90	0.52
2:B:389:ILE:N	2:B:389:ILE:HD12	2.25	0.52
1:A:379:SER:HA	4:A:502:A1BEP:O1	2.08	0.52
2:B:1058:LEU:HA	2:B:1061:VAL:CG1	2.39	0.52
1:A:90:ILE:HD12	1:A:292:ASP:OD1	2.09	0.52
1:A:104:PRO:O	1:A:107:VAL:HG22	2.09	0.52
2:B:938:MET:SD	2:B:939:GLU:HB2	2.50	0.52
2:B:816:LEU:HD13	2:B:831:VAL:HG22	1.91	0.52
1:A:194:MET:HE2	1:A:234:CYS:HB2	1.91	0.52
1:A:292:ASP:HA	1:A:295:ARG:HG3	1.91	0.52
2:B:853:TYR:HB2	2:B:858:LEU:CD1	2.40	0.52
2:B:889:ARG:HD2	2:B:891:TYR:CZ	2.45	0.52
2:B:1058:LEU:HD11	2:B:1097:PHE:HB2	1.91	0.52
1:A:53:LEU:HG	1:A:382:PRO:CD	2.40	0.52
1:A:405:THR:HG22	1:A:406:LYS:N	2.25	0.52
2:B:92:LYS:C	2:B:92:LYS:HD3	2.30	0.52
1:A:296:ILE:HG23	1:A:300:LYS:NZ	2.25	0.52
1:A:380:TRP:HH2	1:A:400:TRP:HZ3	1.58	0.52
2:B:253:ILE:HD11	2:B:302:VAL:HG21	1.93	0.51
2:B:966:LEU:HD13	2:B:976:VAL:HG22	1.92	0.51
2:B:1059:ASN:ND2	2:B:1070:HIS:HB3	2.25	0.51
1:A:108:SER:CA	1:A:111:ARG:HH21	2.23	0.51
1:A:310:CYS:O	1:A:314:ILE:HG13	2.11	0.51
1:A:90:ILE:HG12	1:A:124:ALA:HB1	1.92	0.51
1:A:50:ASP:OD1	1:A:52:SER:N	2.41	0.51
2:B:1061:VAL:HG13	2:B:1062:ILE:N	2.25	0.51
1:A:317:LYS:HZ2	1:A:426:ILE:HB	1.75	0.51
2:B:1130:ILE:O	2:B:1133:VAL:HG12	2.11	0.51
1:A:91:LEU:HD21	1:A:161:GLY:CA	2.37	0.51
2:B:7:VAL:HG22	2:B:8:THR:H	1.76	0.51
2:B:7:VAL:HG22	2:B:8:THR:N	2.25	0.51
1:A:317:LYS:HG3	1:A:426:ILE:HB	1.92	0.51
2:B:843:PRO:HB2	2:B:869:ALA:HB2	1.92	0.51
1:A:143:ALA:HB2	1:A:158:LYS:NZ	2.26	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:166:LYS:C	1:A:182:VAL:HG13	2.32	0.50
2:B:936:LYS:HB3	2:B:938:MET:CE	2.42	0.50
2:B:1104:LYS:O	2:B:1108:VAL:HG23	2.11	0.50
2:B:1100:ILE:CG2	2:B:1104:LYS:HD2	2.41	0.50
1:A:399:GLY:HA3	1:A:417:LEU:HD23	1.94	0.50
1:A:80:VAL:HA	1:A:181:LYS:HA	1.94	0.50
1:A:90:ILE:HG12	1:A:124:ALA:CB	2.41	0.50
1:A:158:LYS:HB2	1:A:158:LYS:HZ2	1.75	0.50
1:A:334:LYS:HA	1:A:337:ILE:HD13	1.93	0.50
2:B:234:GLN:HB3	2:B:235:GLU:OE1	2.11	0.50
2:B:243:ASP:OD1	2:B:244:LYS:N	2.44	0.50
1:A:211:LYS:HD3	1:A:212:PRO:N	2.27	0.50
1:A:351:ASN:ND2	4:A:502:A1BEP:N1	2.53	0.50
1:A:355:TYR:HD1	1:A:356:VAL:H	1.58	0.50
1:A:321:LEU:CD1	1:A:422:LEU:HD23	2.42	0.50
1:A:74:ASP:OD2	1:A:77:SER:HB2	2.12	0.50
1:A:398:ILE:HG22	1:A:417:LEU:HD22	1.93	0.50
1:A:77:SER:O	1:A:183:GLN:HA	2.11	0.49
1:A:211:LYS:NZ	1:A:220:SER:OG	2.44	0.49
1:A:364:LYS:HE2	1:A:366:CYS:SG	2.53	0.49
1:A:405:THR:HG22	1:A:406:LYS:H	1.76	0.49
1:A:101:LEU:HD22	1:A:101:LEU:N	2.27	0.49
1:A:332:THR:CG2	1:A:336:GLU:HB3	2.41	0.49
2:B:318:ASP:OD1	2:B:319:ASN:N	2.46	0.49
2:B:390:ILE:HD12	2:B:390:ILE:N	2.27	0.49
2:B:1097:PHE:CD1	2:B:1098:LEU:HD12	2.40	0.49
1:A:276:ASN:HB3	1:A:279:ASP:OD1	2.12	0.49
1:A:413:LYS:HE2	1:A:413:LYS:CA	2.32	0.49
2:B:286:GLU:O	2:B:297:LEU:HD13	2.12	0.49
2:B:785:GLU:OE1	2:B:785:GLU:HA	2.13	0.49
1:A:322:CYS:SG	1:A:425:THR:HG21	2.53	0.49
2:B:257:THR:O	2:B:259:VAL:HG13	2.13	0.49
1:A:331:ILE:O	1:A:332:THR:OG1	2.26	0.49
1:A:388:VAL:HG22	1:A:400:TRP:NE1	2.23	0.49
2:B:120:ILE:HG23	2:B:135:LEU:CD2	2.43	0.49
2:B:184:ASP:HB2	2:B:185:PRO:CD	2.43	0.49
2:B:198:ARG:H	2:B:198:ARG:HD3	1.77	0.49
2:B:226:PHE:HE1	2:B:287:LYS:HG3	1.78	0.49
1:A:58:THR:CG2	1:A:382:PRO:HG3	2.42	0.48
2:B:727:GLN:HE21	2:B:827:THR:CB	2.26	0.48
1:A:265:ASP:CB	1:A:268:LEU:HG	2.43	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:282:MET:HB2	2:B:305:LEU:HG	1.95	0.48
1:A:112:ASN:O	1:A:116:LYS:HG2	2.12	0.48
1:A:419:ARG:O	1:A:419:ARG:HG2	2.12	0.48
2:B:131:ILE:CD1	2:B:145:LEU:HD21	2.44	0.48
2:B:1106:GLN:HA	2:B:1109:VAL:HG12	1.95	0.48
2:B:1100:ILE:HD12	2:B:1100:ILE:H	1.78	0.48
1:A:92:ILE:O	1:A:95:GLN:HG2	2.13	0.48
2:B:1102:ARG:N	2:B:1103:PRO:HD2	2.28	0.48
1:A:53:LEU:CD2	1:A:382:PRO:HD2	2.44	0.48
1:A:145:ARG:HD3	1:A:146:GLU:H	1.79	0.48
2:B:70:LYS:HE2	2:B:70:LYS:CA	2.44	0.48
2:B:196:SER:O	2:B:200:LYS:N	2.46	0.48
2:B:857:LYS:HD3	2:B:858:LEU:N	2.27	0.48
2:B:78:PHE:HA	2:B:88:ILE:HD13	1.95	0.48
2:B:213:GLU:HG2	2:B:214:ALA:H	1.78	0.48
1:A:264:TRP:HE1	1:A:334:LYS:NZ	2.11	0.48
1:A:291:ASP:OD2	1:A:293:VAL:HG22	2.14	0.48
1:A:350:VAL:CG2	1:A:356:VAL:HG12	2.44	0.48
1:A:70:ARG:CZ	1:A:140:GLU:HG3	2.43	0.47
1:A:198:GLN:N	1:A:198:GLN:OE1	2.47	0.47
2:B:78:PHE:HB2	2:B:88:ILE:CD1	2.44	0.47
2:B:1100:ILE:HG22	2:B:1101:SER:N	2.28	0.47
1:A:88:MET:SD	1:A:128:VAL:HG12	2.55	0.47
1:A:103:HIS:ND1	1:A:104:PRO:HD2	2.29	0.47
1:A:419:ARG:NH2	1:A:420:SER:HA	2.29	0.47
2:B:935:TYR:O	2:B:937:PRO:HD3	2.14	0.47
1:A:141:ILE:HG12	1:A:159:ALA:HB2	1.96	0.47
1:A:262:ARG:NH1	1:A:262:ARG:HB2	2.30	0.47
1:A:325:GLN:HB2	1:A:394:CYS:SG	2.54	0.47
1:A:401:LYS:HZ1	1:A:413:LYS:HE2	1.78	0.47
1:A:321:LEU:CD2	1:A:422:LEU:HG	2.43	0.47
2:B:292:ASP:OD1	2:B:292:ASP:N	2.46	0.47
1:A:410:SER:HB2	1:A:411:PRO:CD	2.44	0.47
2:B:158:ARG:HB3	2:B:158:ARG:CZ	2.45	0.47
1:A:111:ARG:O	1:A:114:ILE:HG13	2.14	0.47
2:B:742:VAL:HG12	2:B:750:THR:HG23	1.97	0.47
2:B:794:ILE:HG22	2:B:795:ASP:O	2.15	0.47
2:B:854:SER:O	2:B:855:ASP:OD1	2.33	0.47
2:B:34:ALA:HB2	2:B:64:MET:HE3	1.96	0.47
2:B:178:ILE:O	2:B:178:ILE:HG13	2.14	0.47
2:B:196:SER:HA	2:B:198:ARG:NH2	2.29	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:299:ASP:OD1	2:B:299:ASP:N	2.48	0.47
2:B:1058:LEU:HD11	2:B:1097:PHE:HD2	1.80	0.47
1:A:103:HIS:O	1:A:107:VAL:HG22	2.15	0.47
1:A:293:VAL:HG23	1:A:294:LEU:CD2	2.36	0.47
1:A:317:LYS:CE	1:A:426:ILE:HB	2.45	0.47
1:A:324:LYS:HD2	1:A:421:ALA:HA	1.97	0.47
1:A:390:GLN:HG2	1:A:397:HIS:CA	2.44	0.47
2:B:341:ASN:OD1	2:B:345:SER:N	2.47	0.47
2:B:388:ARG:NH1	2:B:714:THR:HB	2.30	0.47
1:A:143:ALA:HB3	1:A:158:LYS:CB	2.41	0.47
1:A:160:ILE:HD12	1:A:160:ILE:O	2.15	0.47
1:A:69:GLY:O	1:A:70:ARG:HD2	2.15	0.46
1:A:332:THR:HG22	1:A:333:THR:N	2.30	0.46
2:B:971:ALA:HB3	2:B:973:ASN:ND2	2.29	0.46
2:B:59:GLY:HA2	2:B:1073:TRP:CZ3	2.51	0.46
1:A:101:LEU:HB3	1:A:106:GLU:OE2	2.14	0.46
1:A:190:LEU:N	1:A:190:LEU:HD22	2.30	0.46
1:A:337:ILE:HD12	1:A:337:ILE:N	2.29	0.46
2:B:183:GLN:HG2	2:B:184:ASP:N	2.30	0.46
2:B:244:LYS:HE3	2:B:244:LYS:HB3	1.81	0.46
2:B:760:ALA:HB2	2:B:804:ALA:HB2	1.98	0.46
2:B:931:LEU:HD23	2:B:946:ALA:O	2.15	0.46
2:B:1113:GLN:OE1	2:B:1121:LYS:HB3	2.14	0.46
1:A:397:HIS:HE1	1:A:399:GLY:O	1.98	0.46
2:B:260:CYS:SG	2:B:274:GLY:HA3	2.55	0.46
2:B:1057:ARG:NH1	2:B:1110:ALA:O	2.30	0.46
1:A:211:LYS:HD3	1:A:212:PRO:CD	2.46	0.46
1:A:399:GLY:HA3	1:A:417:LEU:CD2	2.46	0.46
2:B:43:VAL:CG2	2:B:52:VAL:HG21	2.25	0.46
2:B:218:MET:HB2	2:B:232:ILE:HB	1.97	0.46
2:B:252:ILE:CG1	2:B:253:ILE:HD12	2.43	0.46
2:B:849:VAL:HG11	2:B:851:PHE:CZ	2.51	0.46
1:A:88:MET:CE	1:A:128:VAL:HA	2.45	0.46
1:A:53:LEU:CD1	1:A:382:PRO:HG2	2.46	0.46
2:B:130:MET:C	2:B:131:ILE:HD12	2.36	0.46
2:B:184:ASP:HB2	2:B:185:PRO:HD2	1.98	0.46
1:A:127:ASN:ND2	1:A:130:GLU:HG3	2.31	0.46
1:A:285:ALA:HB2	1:A:311:GLU:OE2	2.15	0.46
1:A:76:ASP:HA	1:A:184:ILE:O	2.16	0.46
1:A:106:GLU:O	1:A:110:VAL:HG13	2.16	0.46
1:A:237:LEU:HD21	2:B:328:LEU:HD21	1.97	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:361:THR:CG2	1:A:414:PHE:HZ	2.29	0.46
2:B:75:ASP:OD1	2:B:75:ASP:N	2.49	0.46
2:B:253:ILE:HD12	2:B:253:ILE:N	2.31	0.46
2:B:762:SER:HG	2:B:803:HIS:HD1	1.64	0.46
1:A:194:MET:CE	1:A:234:CYS:HB2	2.45	0.46
1:A:320:SER:HG	1:A:425:THR:HG1	1.61	0.46
1:A:254:MET:CE	1:A:277:PRO:HG3	2.46	0.45
1:A:160:ILE:HD12	1:A:160:ILE:C	2.37	0.45
1:A:287:CYS:O	1:A:288:LEU:HD23	2.15	0.45
2:B:1081:LYS:HD3	2:B:1083:GLU:OE2	2.16	0.45
1:A:238:THR:O	2:B:722:ARG:NH2	2.49	0.45
2:B:356:LEU:O	2:B:379:SER:HB3	2.17	0.45
1:A:70:ARG:HH12	1:A:140:GLU:HG3	1.81	0.45
1:A:134:GLN:HB3	1:A:166:LYS:CE	2.36	0.45
1:A:401:LYS:HZ2	1:A:401:LYS:HG3	1.63	0.45
2:B:208:LYS:HD3	2:B:208:LYS:N	2.31	0.45
1:A:423:LEU:HD13	1:A:424:PRO:O	2.16	0.45
2:B:1080:ARG:CZ	2:B:1080:ARG:HB3	2.46	0.45
2:B:1105:MET:O	2:B:1109:VAL:HG12	2.16	0.45
2:B:189:HIS:ND1	2:B:211:ASN:OD1	2.49	0.45
2:B:196:SER:HB3	2:B:199:GLU:HG2	1.97	0.45
2:B:936:LYS:O	2:B:940:GLY:N	2.43	0.45
1:A:198:GLN:HG3	1:A:201:SER:CB	2.47	0.45
1:A:199:LEU:HD21	2:B:62:ALA:HB2	1.99	0.45
1:A:238:THR:HG21	1:A:245:TYR:OH	2.16	0.45
2:B:252:ILE:HD12	2:B:252:ILE:O	2.17	0.45
1:A:182:VAL:HG12	1:A:183:GLN:N	2.32	0.45
1:A:407:LYS:HD2	1:A:407:LYS:C	2.38	0.45
2:B:75:ASP:C	2:B:76:LEU:HD23	2.37	0.45
2:B:161:GLU:OE2	2:B:191:LYS:NZ	2.25	0.45
2:B:726:TYR:OH	2:B:796:GLN:OE1	2.10	0.45
1:A:204:LYS:HG3	2:B:217:SER:OG	2.17	0.45
1:A:350:VAL:HA	1:A:356:VAL:HA	1.98	0.45
1:A:118:ARG:CG	1:A:141:ILE:HB	2.45	0.45
1:A:72:LEU:HD22	1:A:163:GLN:OE1	2.18	0.44
1:A:91:LEU:CD2	1:A:137:THR:HG21	2.46	0.44
1:A:337:ILE:HD12	1:A:337:ILE:H	1.82	0.44
1:A:352:PRO:HB3	1:A:378:HIS:ND1	2.32	0.44
1:A:388:VAL:HG13	1:A:397:HIS:ND1	2.32	0.44
2:B:123:ILE:HD13	2:B:169:PHE:HE2	1.82	0.44
2:B:922:LEU:HD11	2:B:930:VAL:HG13	1.99	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:1054:MET:HE3	2:B:1054:MET:HA	1.98	0.44
2:B:1098:LEU:CD1	2:B:1133:VAL:HG21	2.47	0.44
1:A:299:LEU:HD23	1:A:299:LEU:O	2.17	0.44
1:A:324:LYS:HG3	1:A:325:GLN:N	2.32	0.44
1:A:108:SER:N	1:A:111:ARG:HH21	2.14	0.44
2:B:110:ASP:HB2	2:B:136:TYR:CZ	2.53	0.44
2:B:118:THR:O	2:B:118:THR:HG22	2.17	0.44
2:B:390:ILE:HG13	2:B:712:ILE:HG12	1.99	0.44
2:B:1069:GLU:CD	2:B:1069:GLU:H	2.21	0.44
2:B:1098:LEU:HD11	2:B:1133:VAL:CG2	2.47	0.44
1:A:123:LEU:HD11	1:A:167:VAL:CG1	2.39	0.44
1:A:334:LYS:O	1:A:337:ILE:HD13	2.18	0.44
1:A:362:VAL:HG22	1:A:415:TRP:O	2.18	0.44
2:B:840:GLU:OE2	2:B:844:LYS:HD3	2.17	0.44
1:A:91:LEU:HD22	1:A:137:THR:HG21	1.99	0.44
2:B:208:LYS:HE2	2:B:210:GLU:HG2	1.99	0.44
2:B:709:LYS:C	2:B:709:LYS:HD2	2.38	0.44
1:A:64:MET:SD	1:A:145:ARG:HB2	2.57	0.44
1:A:67:PHE:HE2	1:A:144:TYR:HB3	1.83	0.44
1:A:70:ARG:HA	1:A:70:ARG:HH11	1.80	0.44
1:A:198:GLN:HG3	1:A:201:SER:HG	1.78	0.44
1:A:350:VAL:CB	1:A:356:VAL:HG12	2.47	0.44
1:A:356:VAL:HG23	1:A:356:VAL:O	2.17	0.44
1:A:391:CYS:N	1:A:396:SER:O	2.38	0.44
2:B:270:ARG:HD2	2:B:282:MET:CE	2.42	0.44
2:B:770:LEU:HD21	2:B:865:GLU:HB2	1.98	0.44
2:B:879:LYS:HB3	2:B:891:TYR:O	2.17	0.44
2:B:881:LEU:HD21	2:B:921:ILE:HD13	2.00	0.44
1:A:96:THR:HA	1:A:160:ILE:HG22	2.00	0.43
1:A:148:GLN:NE2	1:A:153:GLU:HG3	2.33	0.43
1:A:149:ASP:CG	1:A:152:ILE:HB	2.38	0.43
1:A:91:LEU:C	1:A:91:LEU:HD23	2.38	0.43
2:B:65:GLU:OE1	2:B:65:GLU:HA	2.18	0.43
1:A:264:TRP:HE1	1:A:334:LYS:HZ3	1.66	0.43
2:B:131:ILE:HG22	2:B:133:LEU:HD13	2.00	0.43
2:B:238:THR:HG22	2:B:247:ALA:CB	2.49	0.43
1:A:70:ARG:HH22	1:A:140:GLU:HG3	1.81	0.43
1:A:168:LEU:HG	1:A:181:LYS:O	2.18	0.43
2:B:235:GLU:HB3	2:B:254:LYS:HZ2	1.82	0.43
1:A:53:LEU:CG	1:A:382:PRO:HG2	2.48	0.43
1:A:321:LEU:HD13	1:A:422:LEU:HD23	2.00	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:364:LYS:HD3	1:A:364:LYS:C	2.38	0.43
2:B:32:LEU:HD12	2:B:32:LEU:N	2.34	0.43
2:B:342:GLU:OE1	2:B:342:GLU:N	2.34	0.43
2:B:809:GLN:O	2:B:810:ASN:HB2	2.18	0.43
2:B:969:GLU:HG3	2:B:975:PHE:CE1	2.53	0.43
2:B:970:ASN:O	2:B:971:ALA:HB3	2.19	0.43
2:B:1115:ASP:C	2:B:1122:ARG:HH21	2.22	0.43
1:A:323:CYS:HB2	1:A:331:ILE:HD11	2.00	0.43
1:A:355:TYR:HD1	1:A:356:VAL:N	2.16	0.43
2:B:45:THR:OG1	2:B:47:GLU:OE1	2.29	0.43
2:B:226:PHE:CE1	2:B:287:LYS:HG3	2.52	0.43
2:B:936:LYS:HD3	2:B:943:GLU:CG	2.46	0.43
2:B:1062:ILE:HG13	2:B:1063:LYS:N	2.33	0.43
1:A:349:TYR:CE1	1:A:380:TRP:HB3	2.54	0.43
2:B:723:LYS:O	2:B:735:VAL:HG13	2.18	0.43
2:B:928:ARG:NE	2:B:969:GLU:OE2	2.50	0.43
2:B:936:LYS:HB3	2:B:938:MET:HE3	2.01	0.43
2:B:1054:MET:HE1	2:B:1112:LEU:HD11	2.01	0.43
1:A:104:PRO:HA	1:A:107:VAL:HG22	2.01	0.43
2:B:757:SER:HG	2:B:790:ASN:CG	2.21	0.43
1:A:135:PHE:HE2	1:A:300:LYS:HG2	1.75	0.43
1:A:401:LYS:HZ3	1:A:414:PHE:H	1.64	0.43
1:A:409:MET:SD	1:A:410:SER:N	2.92	0.43
2:B:726:TYR:HE2	2:B:728:GLU:HG2	1.84	0.43
2:B:127:GLU:O	2:B:127:GLU:HG3	2.17	0.43
2:B:280:LEU:O	2:B:305:LEU:HB2	2.19	0.43
2:B:769:LYS:HE3	2:B:769:LYS:HB3	1.78	0.43
1:A:72:LEU:HD13	1:A:72:LEU:C	2.39	0.42
2:B:198:ARG:HD3	2:B:198:ARG:N	2.34	0.42
2:B:985:THR:HG22	2:B:988:GLU:OE2	2.19	0.42
2:B:1036:MET:HG2	2:B:1037:ILE:N	2.32	0.42
1:A:113:LEU:HD21	1:A:119:THR:N	2.34	0.42
1:A:141:ILE:HD13	1:A:157:VAL:HG21	2.01	0.42
1:A:244:LEU:HD13	1:A:244:LEU:C	2.39	0.42
1:A:349:TYR:HB3	1:A:380:TRP:NE1	2.34	0.42
1:A:361:THR:HB	1:A:414:PHE:CZ	2.53	0.42
1:A:87:VAL:HG23	1:A:87:VAL:O	2.18	0.42
1:A:135:PHE:HE1	1:A:166:LYS:HG2	1.81	0.42
1:A:165:PHE:CG	1:A:182:VAL:HG11	2.53	0.42
1:A:193:THR:HG21	1:A:245:TYR:HD1	1.84	0.42
2:B:369:ARG:HA	2:B:369:ARG:CZ	2.48	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:1089:ILE:HD13	2:B:1089:ILE:HA	1.89	0.42
1:A:204:LYS:HB2	2:B:217:SER:OG	2.19	0.42
2:B:92:LYS:HZ1	2:B:94:SER:CB	2.27	0.42
2:B:879:LYS:CB	2:B:890:LEU:HD21	2.47	0.42
1:A:99:LEU:HB3	1:A:157:VAL:CG1	2.49	0.42
1:A:264:TRP:CD1	1:A:264:TRP:N	2.85	0.42
1:A:367:ASN:HA	1:A:392:LYS:HE3	2.02	0.42
2:B:24:THR:HG22	2:B:91:TYR:CE2	2.55	0.42
2:B:92:LYS:HD2	2:B:99:ASP:OD1	2.19	0.42
2:B:823:LYS:HE2	2:B:823:LYS:HB2	1.78	0.42
2:B:1100:ILE:CG2	2:B:1104:LYS:HB2	2.49	0.42
2:B:252:ILE:CD1	2:B:253:ILE:HD12	2.50	0.42
2:B:727:GLN:HE21	2:B:827:THR:HG22	1.83	0.42
2:B:936:LYS:HG2	2:B:941:ASN:O	2.18	0.42
1:A:59:TYR:CZ	1:A:380:TRP:HD1	2.38	0.42
2:B:1122:ARG:HG3	2:B:1123:GLU:N	2.35	0.42
2:B:1136:LEU:HA	2:B:1136:LEU:HD23	1.79	0.42
1:A:103:HIS:CB	1:A:106:GLU:HG2	2.39	0.42
1:A:119:THR:HG22	1:A:140:GLU:HG2	2.01	0.42
2:B:361:ASP:OD2	2:B:723:LYS:HD3	2.19	0.42
2:B:835:MET:CB	2:B:845:GLN:HG3	2.50	0.42
2:B:843:PRO:CB	2:B:869:ALA:HB2	2.50	0.42
1:A:53:LEU:CG	1:A:382:PRO:HD2	2.48	0.42
1:A:59:TYR:OH	1:A:350:VAL:HG12	2.20	0.42
1:A:173:GLN:HG2	1:A:174:SER:H	1.85	0.42
1:A:193:THR:HG21	1:A:245:TYR:CD1	2.55	0.42
1:A:200:GLU:OE1	1:A:201:SER:N	2.53	0.42
1:A:276:ASN:OD1	1:A:278:ILE:N	2.52	0.42
2:B:25:SER:OG	2:B:28:ASP:HB2	2.20	0.41
2:B:92:LYS:HD3	2:B:92:LYS:O	2.20	0.41
2:B:812:TYR:O	2:B:833:THR:OG1	2.17	0.41
2:B:1022:THR:OG1	2:B:1023:PRO:HD2	2.20	0.41
1:A:284:VAL:O	1:A:288:LEU:HG	2.20	0.41
2:B:1100:ILE:HG23	2:B:1104:LYS:HD2	2.02	0.41
1:A:126:SER:OG	1:A:132:GLU:OE2	2.29	0.41
1:A:202:LEU:HA	1:A:204:LYS:HZ1	1.84	0.41
1:A:209:PRO:HA	2:B:183:GLN:NE2	2.35	0.41
2:B:19:VAL:HG22	2:B:20:THR:N	2.34	0.41
2:B:823:LYS:HD3	2:B:823:LYS:N	2.36	0.41
2:B:288:GLU:OE2	2:B:290:GLN:HB3	2.20	0.41
2:B:984:THR:H	2:B:988:GLU:CD	2.24	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:238:THR:HG22	1:A:239:SER:N	2.24	0.41
1:A:136:GLY:HA3	1:A:165:PHE:CE1	2.56	0.41
2:B:198:ARG:CD	2:B:198:ARG:N	2.83	0.41
2:B:361:ASP:OD1	2:B:362:MET:N	2.54	0.41
2:B:823:LYS:HE2	2:B:823:LYS:H	1.86	0.41
1:A:70:ARG:HD3	1:A:162:ARG:HH21	1.85	0.41
1:A:329:THR:HG23	1:A:367:ASN:ND2	2.35	0.41
1:A:350:VAL:HB	1:A:356:VAL:HG12	2.03	0.41
2:B:60:LYS:O	2:B:81:THR:HA	2.20	0.41
2:B:810:ASN:O	2:B:835:MET:HE3	2.21	0.41
2:B:985:THR:HG22	2:B:988:GLU:HG2	2.00	0.41
2:B:1059:ASN:HD21	2:B:1070:HIS:HB3	1.86	0.41
2:B:342:GLU:OE2	2:B:343:GLN:NE2	2.53	0.41
2:B:385:GLY:HA3	2:B:719:GLU:O	2.21	0.41
2:B:721:PRO:O	2:B:722:ARG:HD2	2.21	0.41
2:B:337:ASN:O	2:B:346:TYR:HD2	2.05	0.40
2:B:909:ILE:HD12	2:B:925:ASP:HB2	2.03	0.40
2:B:985:THR:O	2:B:988:GLU:HG3	2.22	0.40
2:B:1100:ILE:HG22	2:B:1104:LYS:HB2	2.03	0.40
1:A:99:LEU:HD12	1:A:99:LEU:HA	1.90	0.40
1:A:103:HIS:O	1:A:106:GLU:HG2	2.21	0.40
1:A:371:ILE:C	1:A:387:THR:HG23	2.41	0.40
2:B:42:TYR:CD2	2:B:51:PRO:HA	2.56	0.40
2:B:44:VAL:HG22	2:B:49:LEU:CD2	2.51	0.40
2:B:330:ASP:HB3	2:B:353:PHE:O	2.21	0.40
1:A:207:ILE:CG2	2:B:165:ILE:HD12	2.36	0.40
1:A:211:LYS:HZ1	1:A:220:SER:CB	2.34	0.40
2:B:709:LYS:HD2	2:B:709:LYS:O	2.22	0.40
2:B:786:VAL:HG12	2:B:787:GLU:N	2.37	0.40
1:A:123:LEU:HD12	1:A:133:ALA:CB	2.41	0.40
1:A:253:LEU:O	1:A:257:ILE:HG12	2.21	0.40
2:B:70:LYS:HE2	2:B:70:LYS:HA	2.03	0.40
2:B:756:ALA:HB1	2:B:801:VAL:HG21	2.03	0.40
2:B:853:TYR:HB2	2:B:858:LEU:HD12	2.03	0.40
1:A:53:LEU:HD21	1:A:382:PRO:CG	2.52	0.40
1:A:64:MET:HA	1:A:145:ARG:NH2	2.36	0.40
1:A:70:ARG:HD3	1:A:162:ARG:NH2	2.36	0.40
1:A:135:PHE:CD2	1:A:300:LYS:HG2	2.55	0.40
2:B:936:LYS:HB3	2:B:938:MET:HE2	2.04	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	369/467 (79%)	347 (94%)	22 (6%)	0	100	100
2	B	798/836 (96%)	752 (94%)	46 (6%)	0	100	100
All	All	1167/1303 (90%)	1099 (94%)	68 (6%)	0	100	100

There are no Ramachandran outliers to report.

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

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	337/421 (80%)	320 (95%)	17 (5%)	20	53
2	B	704/727 (97%)	686 (97%)	18 (3%)	41	72
All	All	1041/1148 (91%)	1006 (97%)	35 (3%)	34	66

All (35) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	73	HIS
1	A	144	TYR
1	A	171	ARG
1	A	202	LEU
1	A	204	LYS
1	A	292	ASP
1	A	323	CYS
1	A	338	PHE

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	A	346	MET
1	A	353	HIS
1	A	355	TYR
1	A	373	ARG
1	A	381	PHE
1	A	384	TYR
1	A	387	THR
1	A	407	LYS
1	A	419	ARG
2	B	1	MET
2	B	111	ARG
2	B	130	MET
2	B	158	ARG
2	B	198	ARG
2	B	208	LYS
2	B	292	ASP
2	B	297	LEU
2	B	709	LYS
2	B	725	CYS
2	B	800	GLU
2	B	867	LYS
2	B	928	ARG
2	B	938	MET
2	B	962	ASP
2	B	1054	MET
2	B	1062	ILE
2	B	1080	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (7) such sidechains are listed below:

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	A	73	HIS
1	A	95	GLN
1	A	127	ASN
1	A	367	ASN
2	B	183	GLN
2	B	337	ASN
2	B	727	GLN

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

## 5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 2 ligands modelled in this entry, 1 is monoatomic - leaving 1 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
4	A1BEP	A	502	-	23,28,28	0.78	1 (4%)	29,40,40	0.78	2 (6%)

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	A1BEP	A	502	-	-	0/4/29/29	0/4/4/4

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	502	A1BEP	C7-N1	-2.82	1.30	1.34

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	502	A1BEP	C7-N1-N2	2.43	106.58	104.48
4	A	502	A1BEP	C4-C5-N2	-2.23	106.08	109.17

There are no chirality outliers.

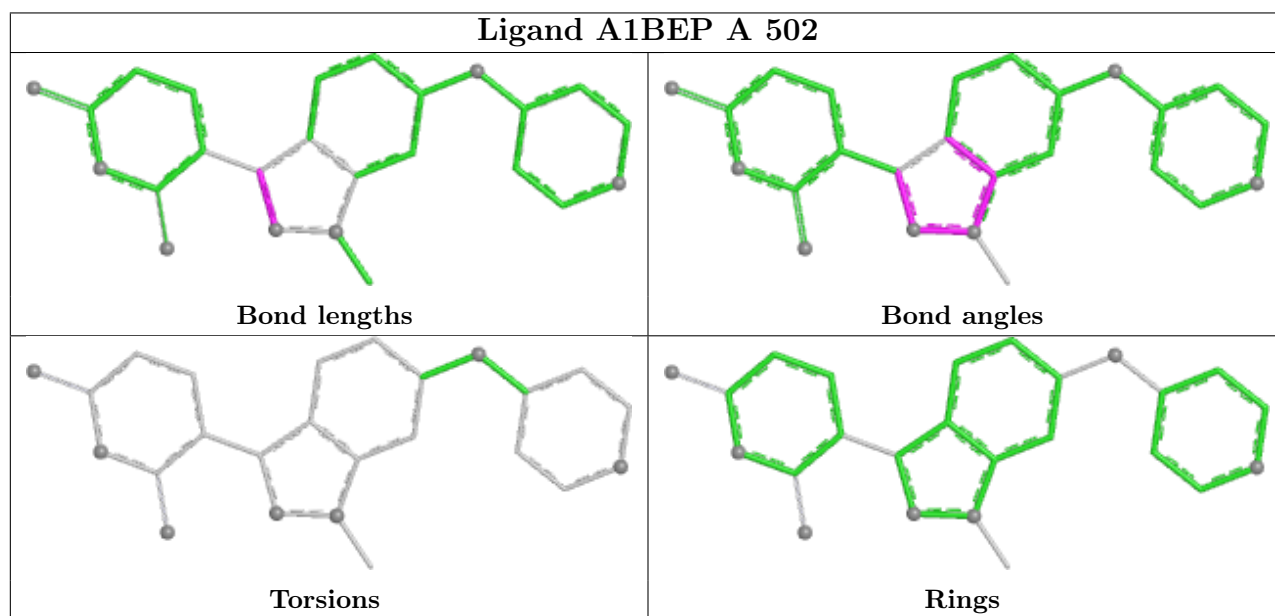
There are no torsion outliers.

There are no ring outliers.

1 monomer is involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	502	A1BEP	3	0

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



## 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.

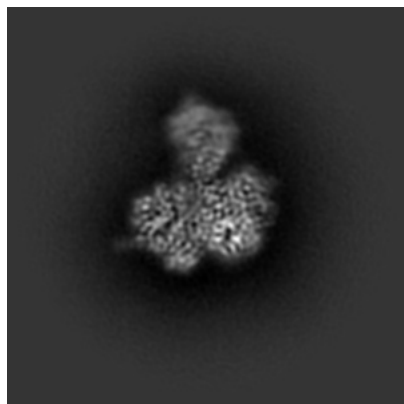
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-47111. These allow visual inspection of the internal detail of the map and identification of artifacts.

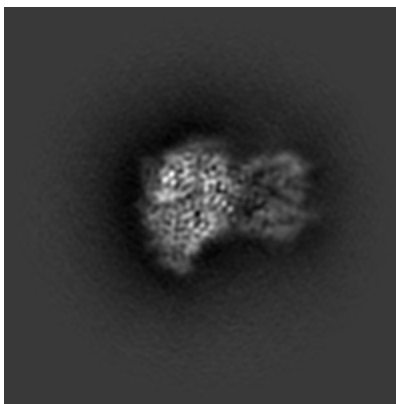
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

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

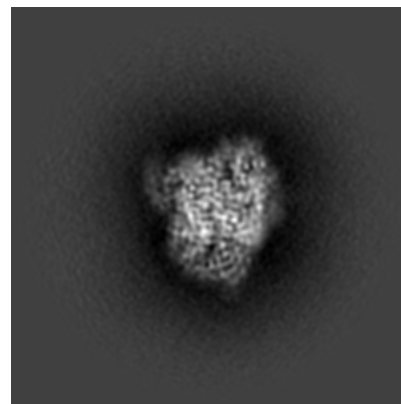
#### 6.1.1 Primary map



X

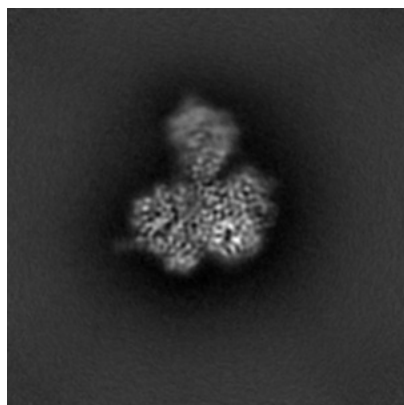


Y

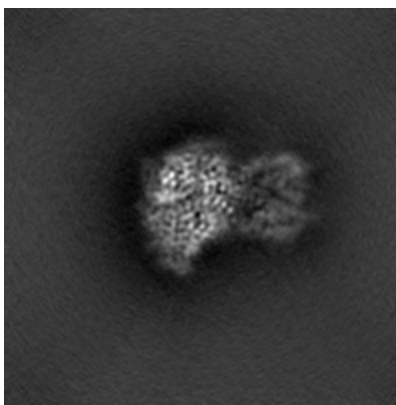


Z

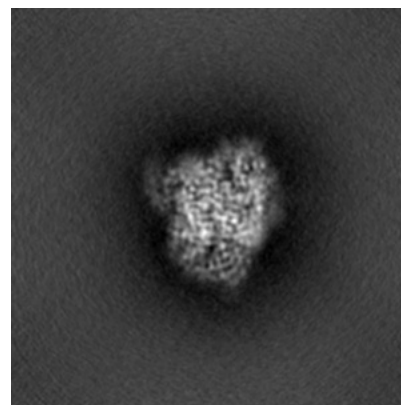
#### 6.1.2 Raw map



X



Y

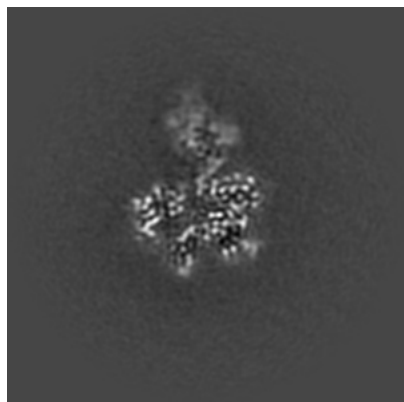


Z

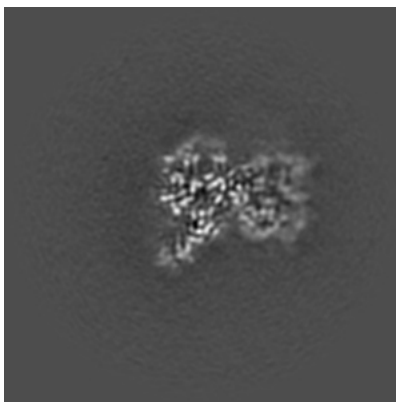
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices [i](#)

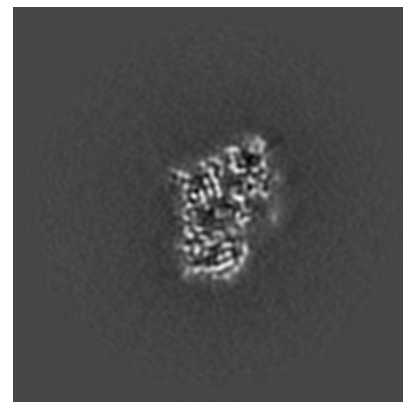
### 6.2.1 Primary map



X Index: 110

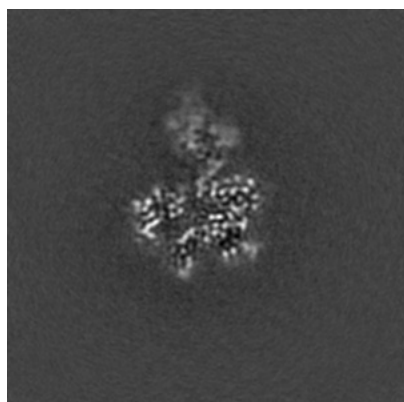


Y Index: 110

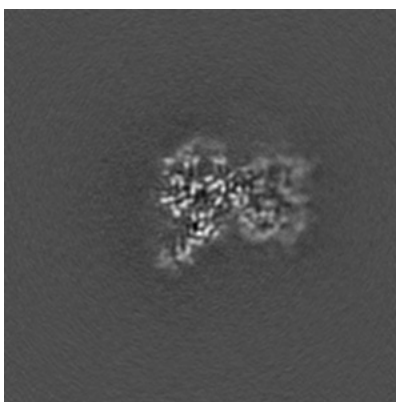


Z Index: 110

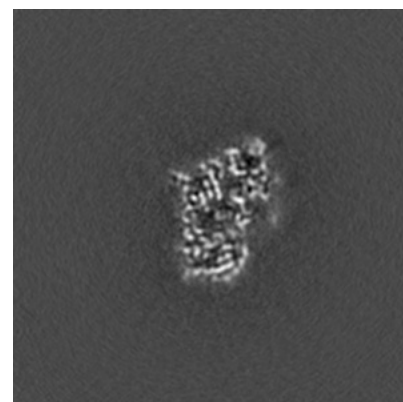
### 6.2.2 Raw map



X Index: 110



Y Index: 110



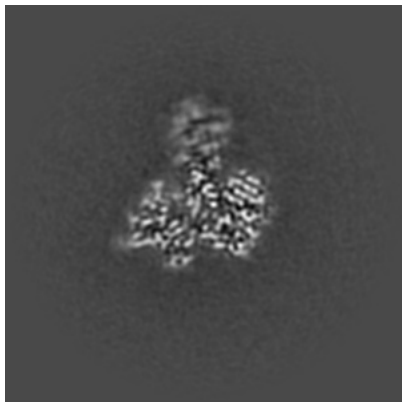
Z Index: 110

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

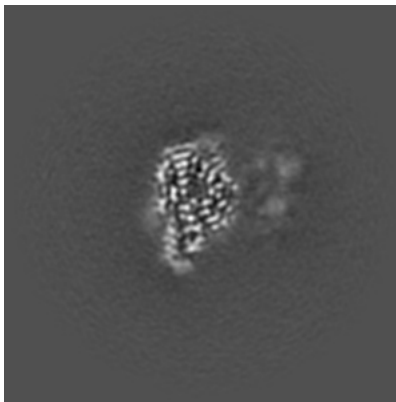


## 6.3 Largest variance slices [i](#)

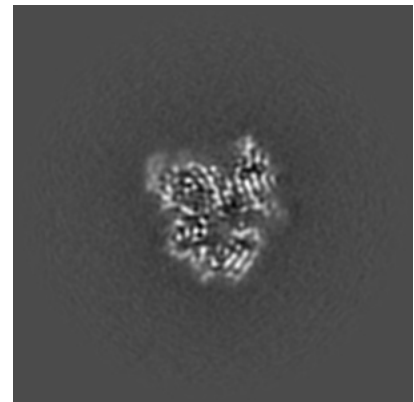
### 6.3.1 Primary map



X Index: 124

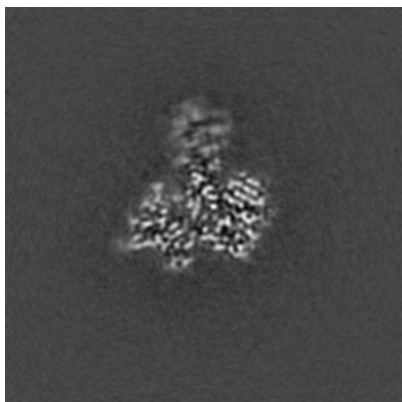


Y Index: 124

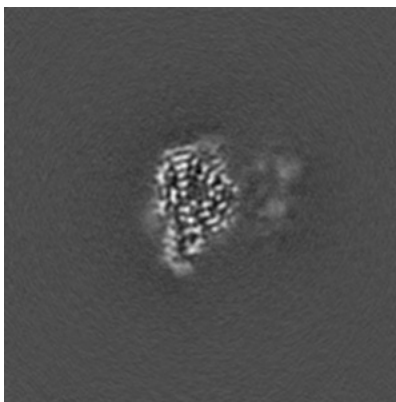


Z Index: 100

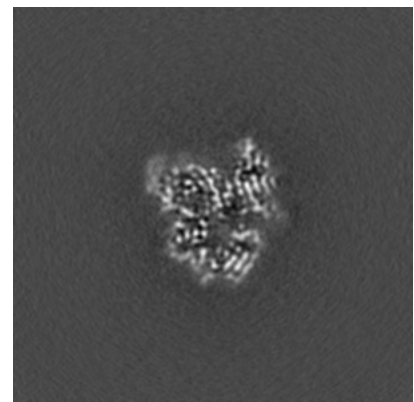
### 6.3.2 Raw map



X Index: 124



Y Index: 124

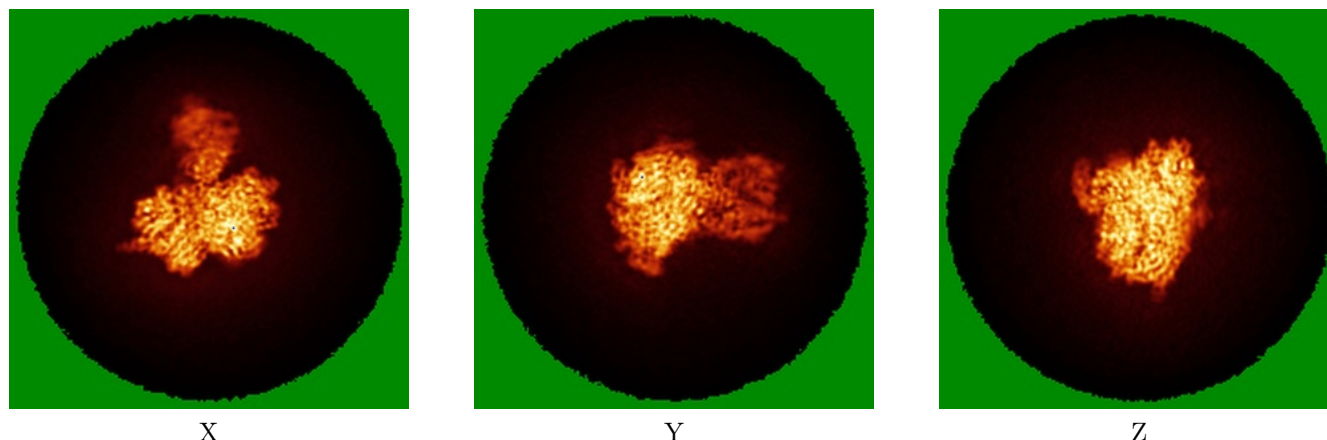


Z Index: 100

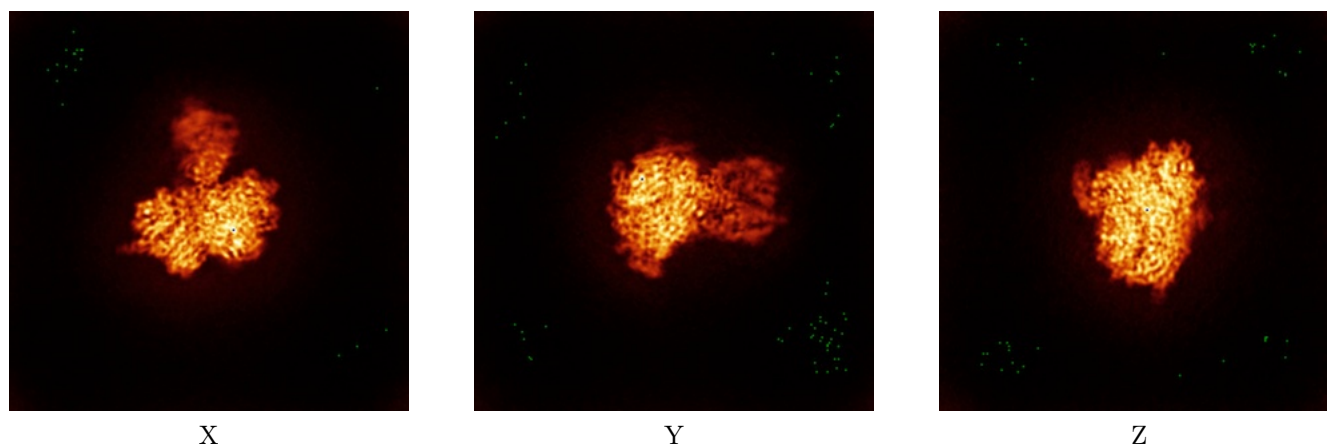
The images above show the largest variance slices of the map in three orthogonal directions.

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

### 6.4.1 Primary map



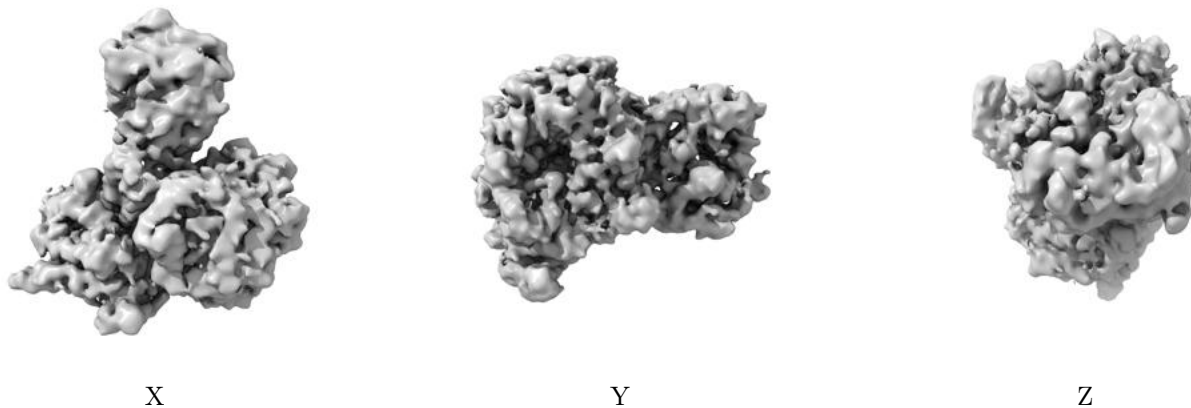
### 6.4.2 Raw map



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 0.2. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

### 6.5.2 Raw map



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

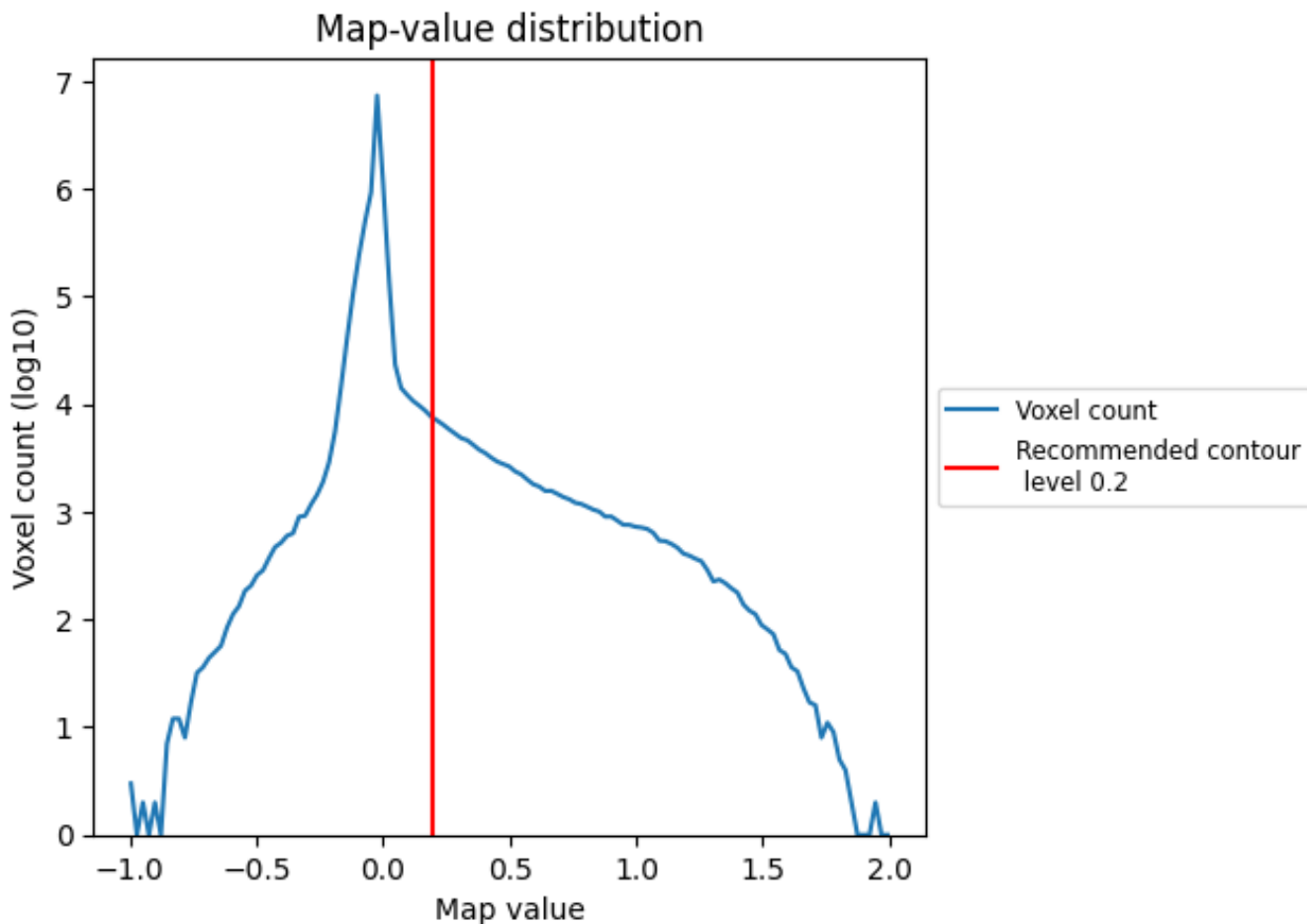
## 6.6 Mask visualisation [i](#)

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

## 7 Map analysis [i](#)

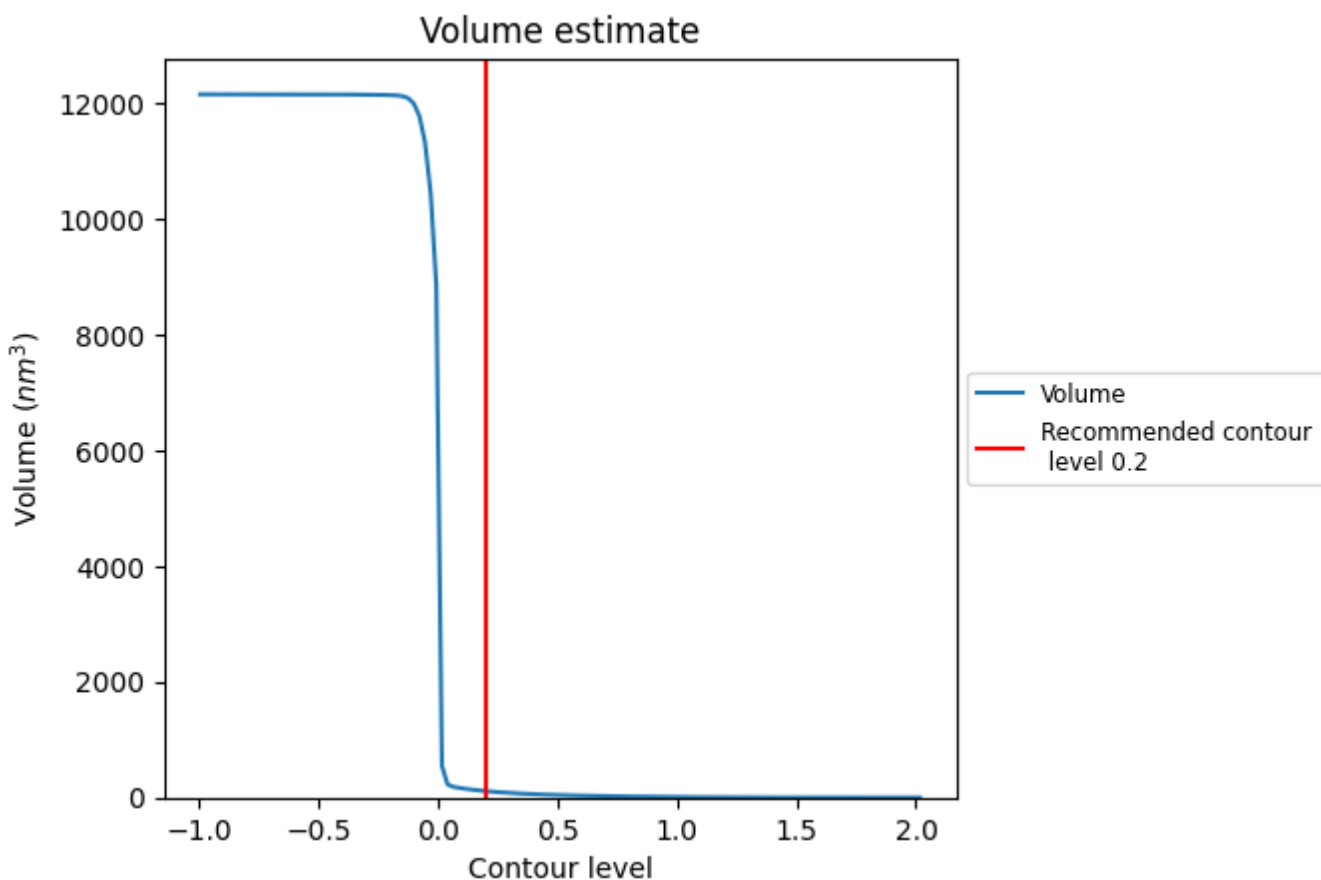
This section contains the results of statistical analysis of the map.

### 7.1 Map-value distribution [i](#)



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

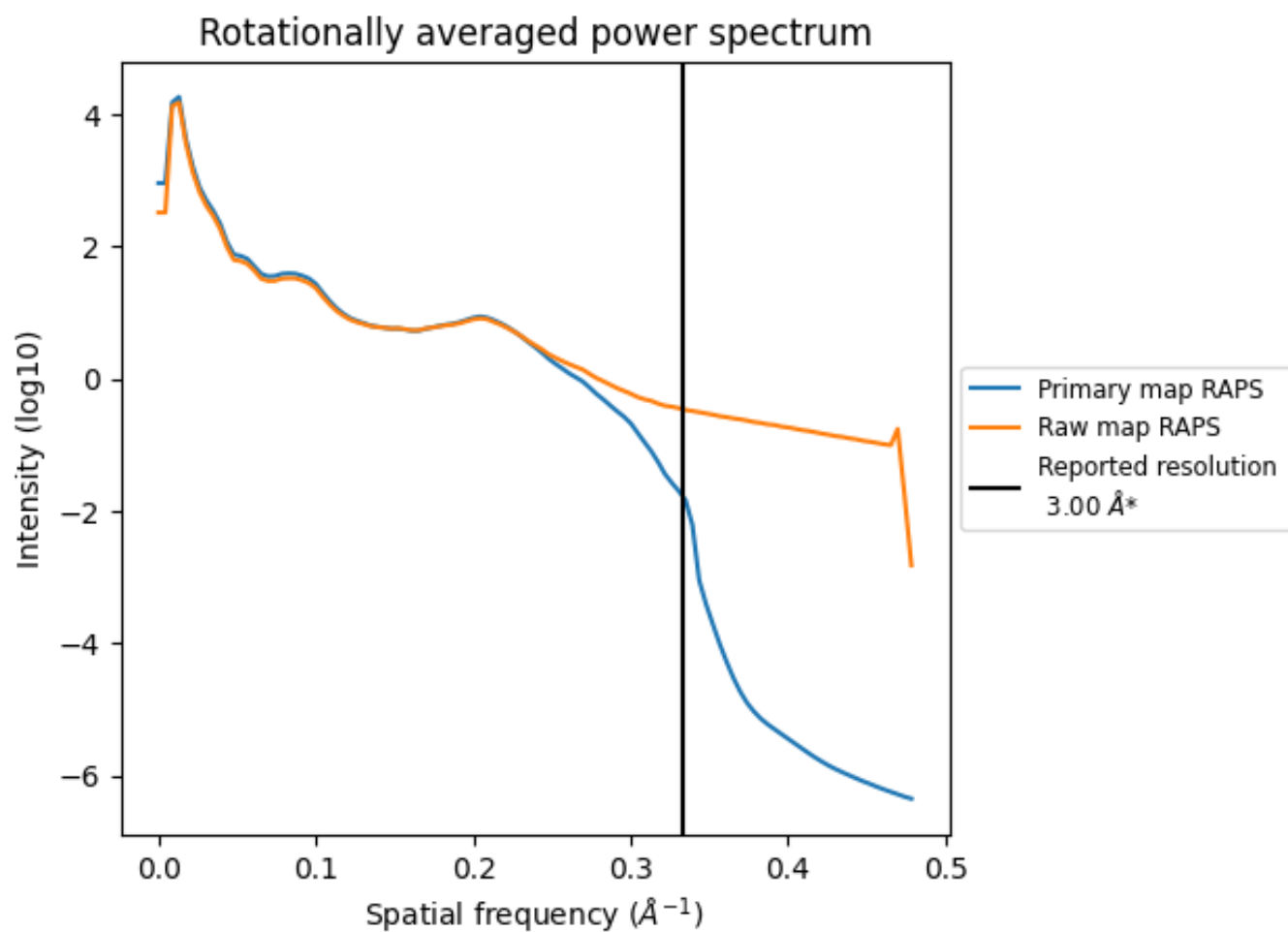
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 112 nm<sup>3</sup>; this corresponds to an approximate mass of 101 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](#)

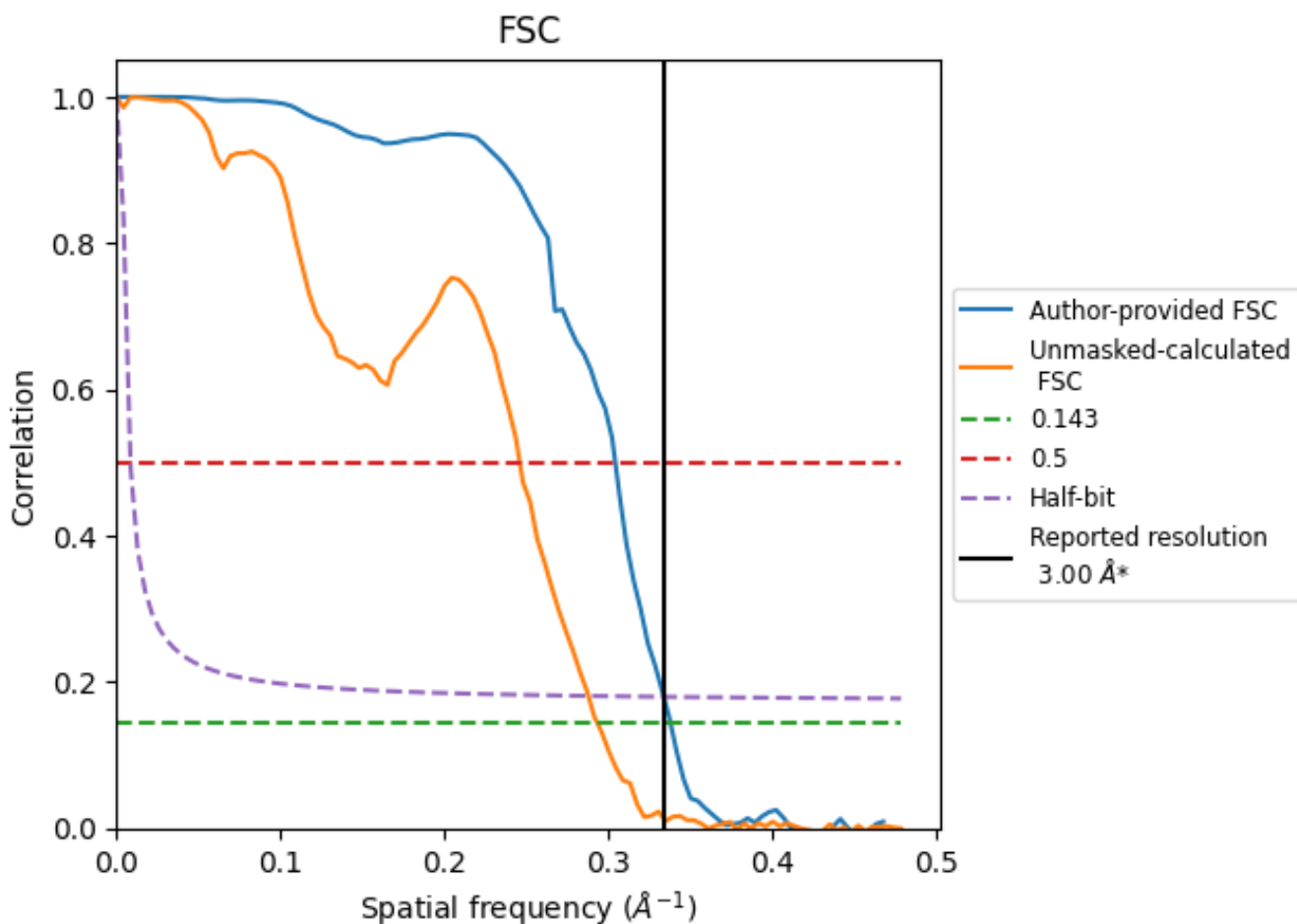


\*Reported resolution corresponds to spatial frequency of 0.333 Å<sup>-1</sup>

## 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 0.333 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	2.96	3.29	3.00
Unmasked-calculated*	3.41	4.07	3.47

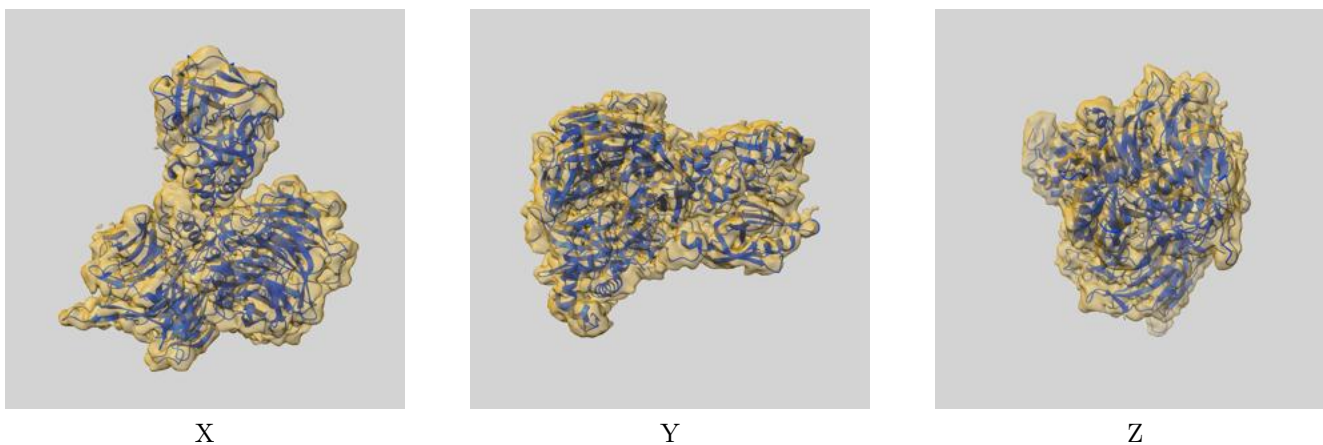
\*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 3.41 differs from the reported value 3.0 by more than 10 %



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

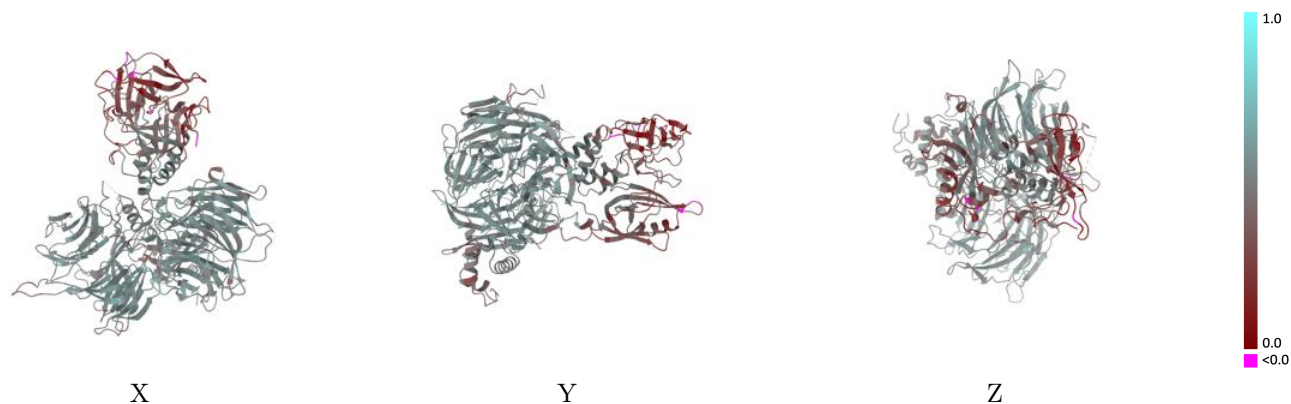
This section contains information regarding the fit between EMDB map EMD-47111 and PDB model 9DQD. Per-residue inclusion information can be found in section [3](#) on page [5](#).

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



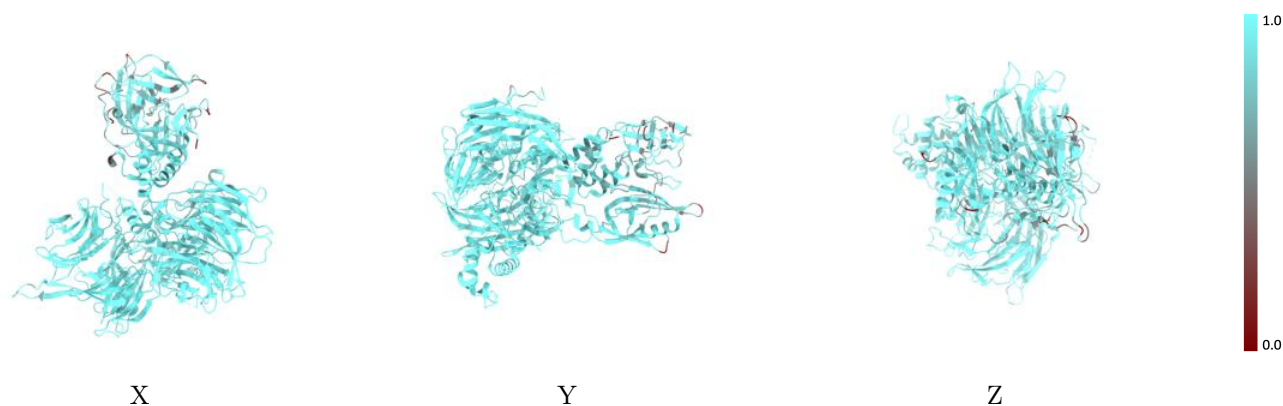
The images above show the 3D surface view of the map at the recommended contour level 0.2 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



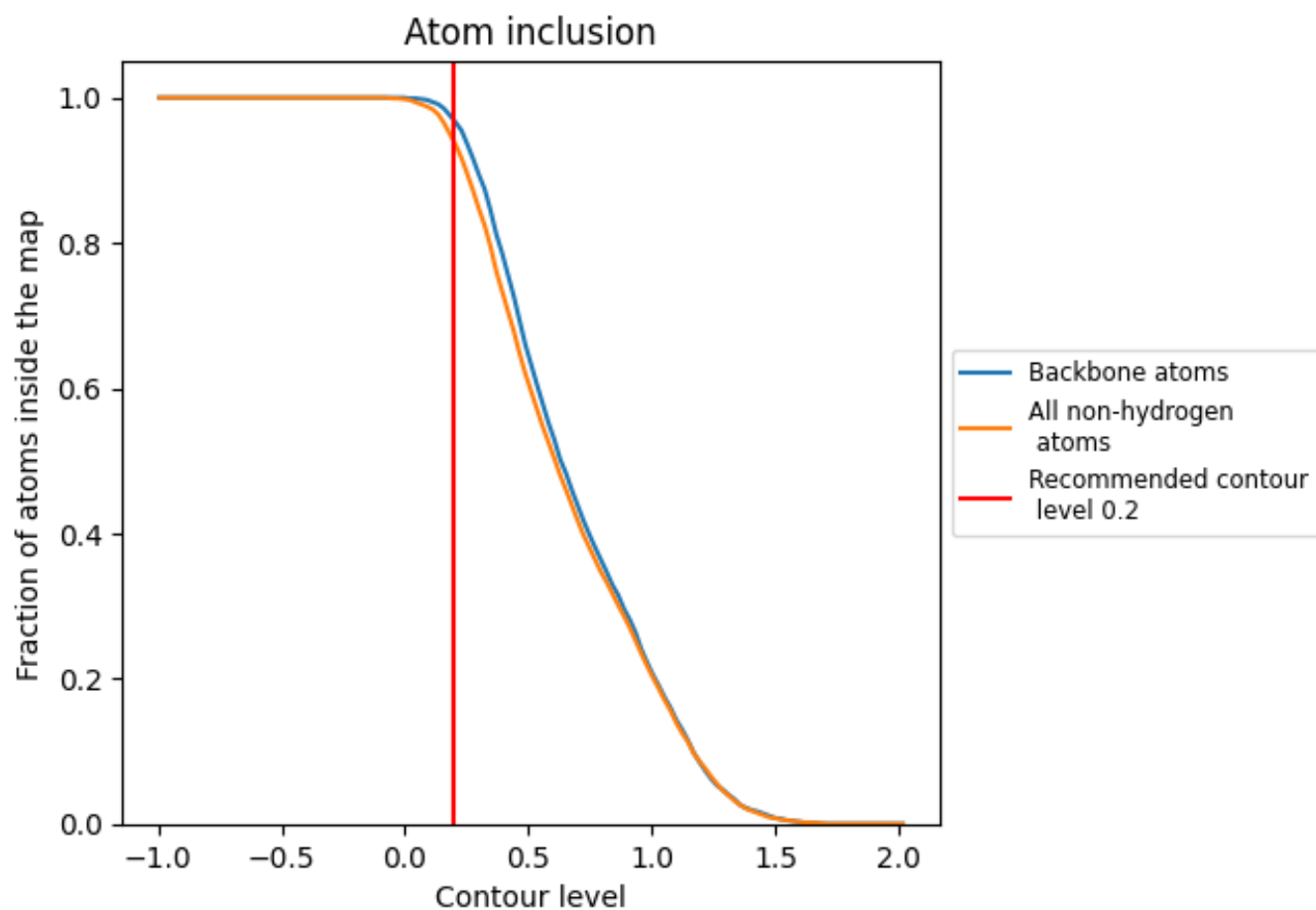
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.2).







## 9.4 Atom inclusion [i](#)



At the recommended contour level, 97% of all backbone atoms, 94% 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 (0.2) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.9380	 0.4670
A	 0.8580	 0.3600
B	 0.9770	 0.5180

