Full wwPDB EM Validation Report (i)

Jun 27, 2025 – 01:52 AM JST

PDB ID	:	7DFV / pdb_00007dfv
EMDB ID	:	EMD-30579
Title	:	Cryo-EM structure of plant NLR RPP1 tetramer core part
Authors	:	Ma, S.C.; Lapin, D.; Liu, L.; Sun, Y.; Song, W.; Zhang, X.X.; Logemann, E.; Yu, D.L.; Wang, J.; Jirschitzka, J.; Han, Z.F.; SchulzeLefert, P.; Parker, J.E.; Chai, J.J.
Deposited on	:	2020-11-10
Resolution	:	2.99 Å(reported)

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

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/EMValidationReportHelp
with specific help available everywhere you see the (i) symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

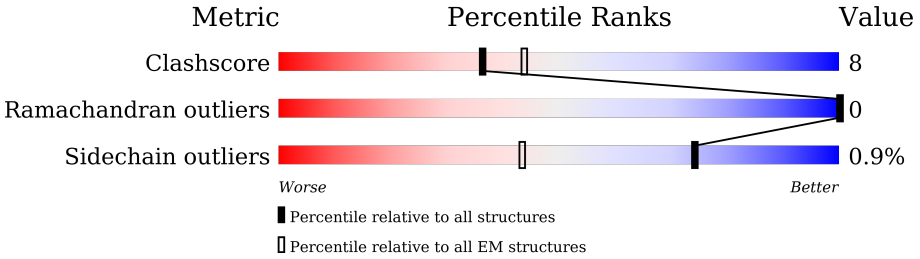
EMDB validation analysis	:	0.0.1.dev118
MolProbity	:	4-5-2 with Phenix2.0rc1
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline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

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
ELECTRON MICROSCOPY

The reported resolution of this entry is 2.99 Å.

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



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

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=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	1221	33% 9% 58%
1	B	1221	35% 8% 57%
1	C	1221	33% 9% 58%
1	D	1221	35% 8% 57%

2 Entry composition (i)

There is only 1 type of molecule in this entry. The entry contains 16580 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called NAD+ hydrolase (NADase).

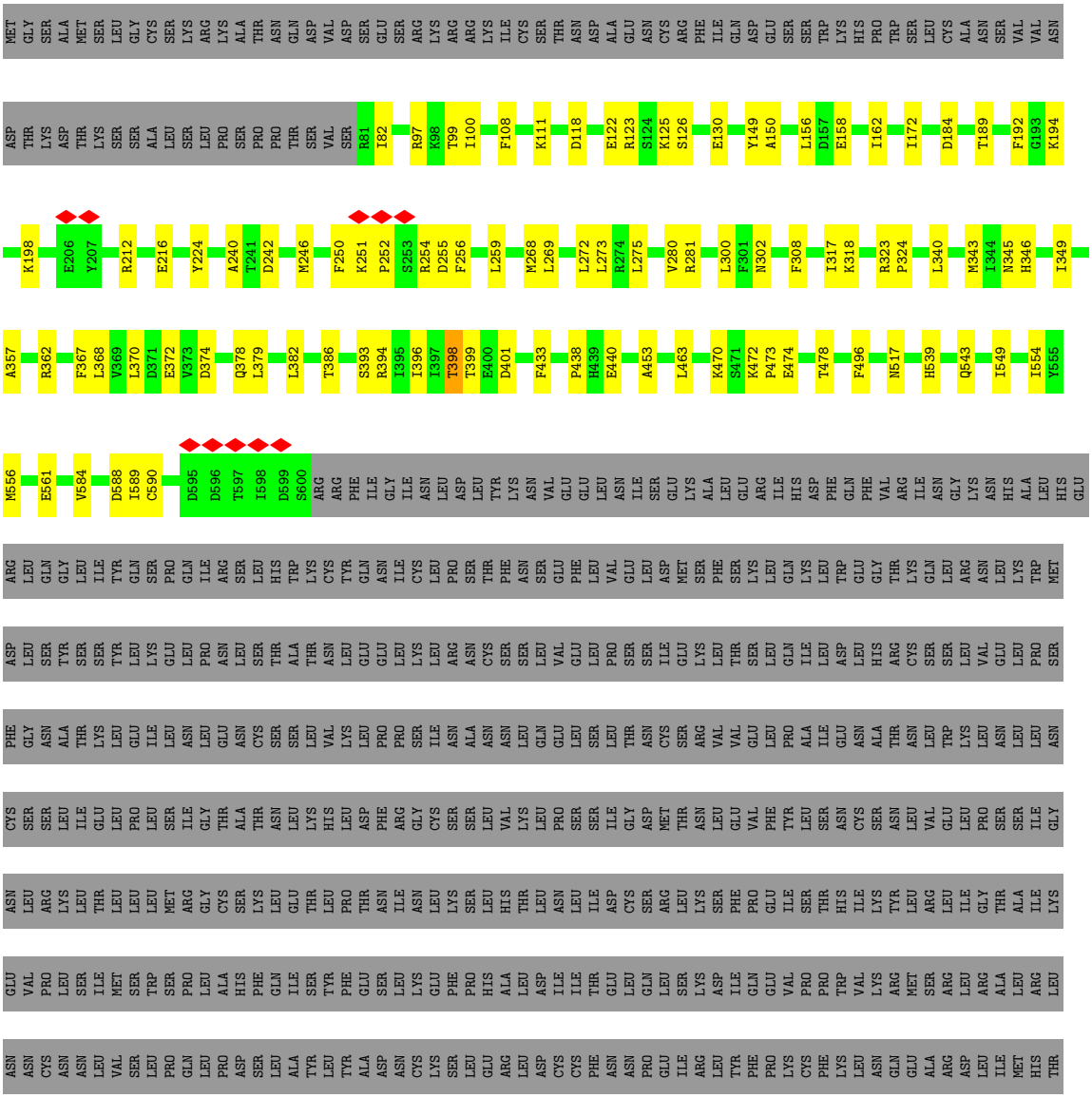
Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	B	520	4163	2654	723	762	24	0	0
1	C	516	4127	2628	717	758	24	0	0
1	D	520	4163	2654	723	762	24	0	0
1	A	516	4127	2628	717	758	24	0	0

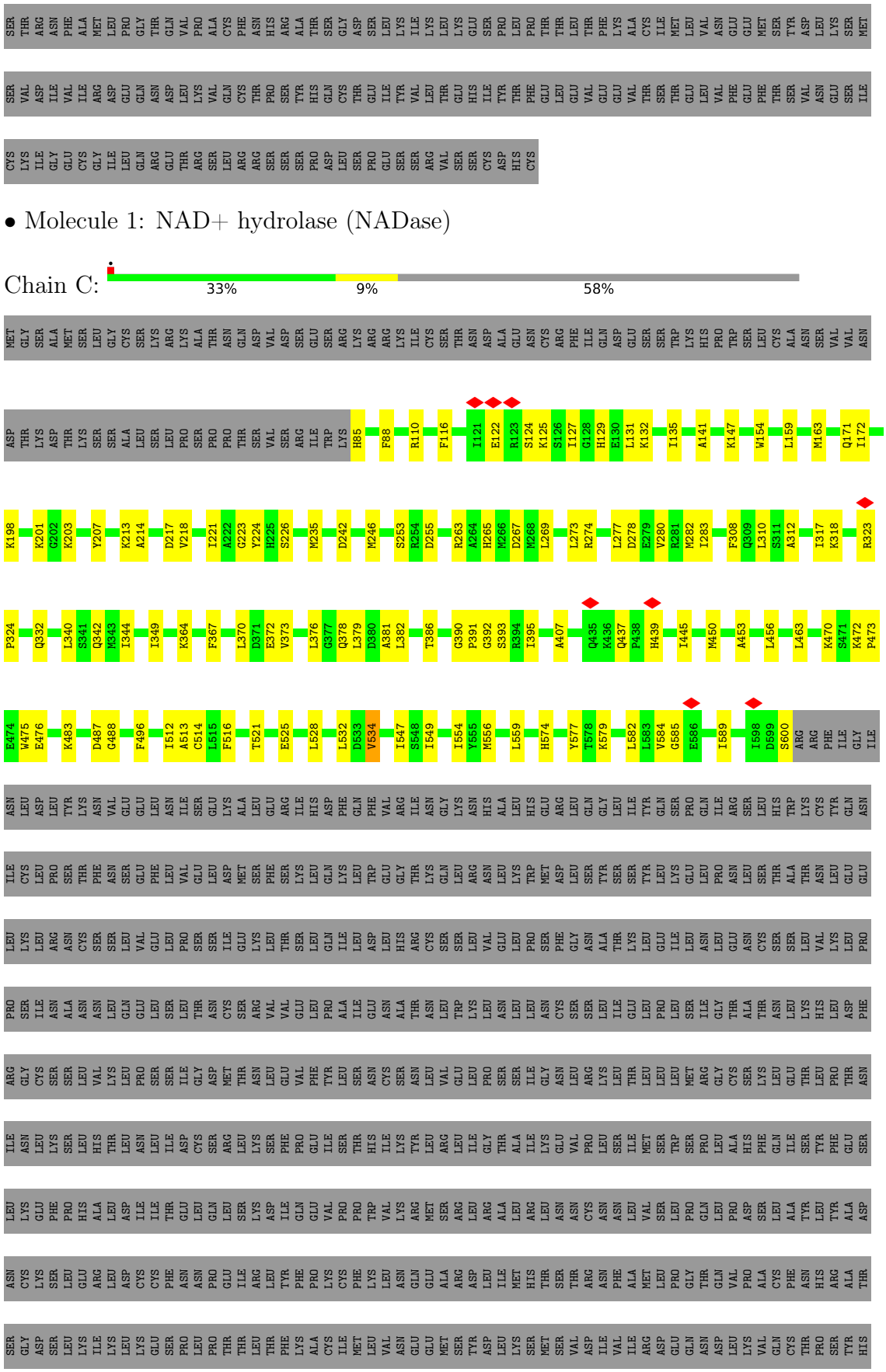
3 Residue-property plots (i)

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: NAD+ hydrolase (NADase)

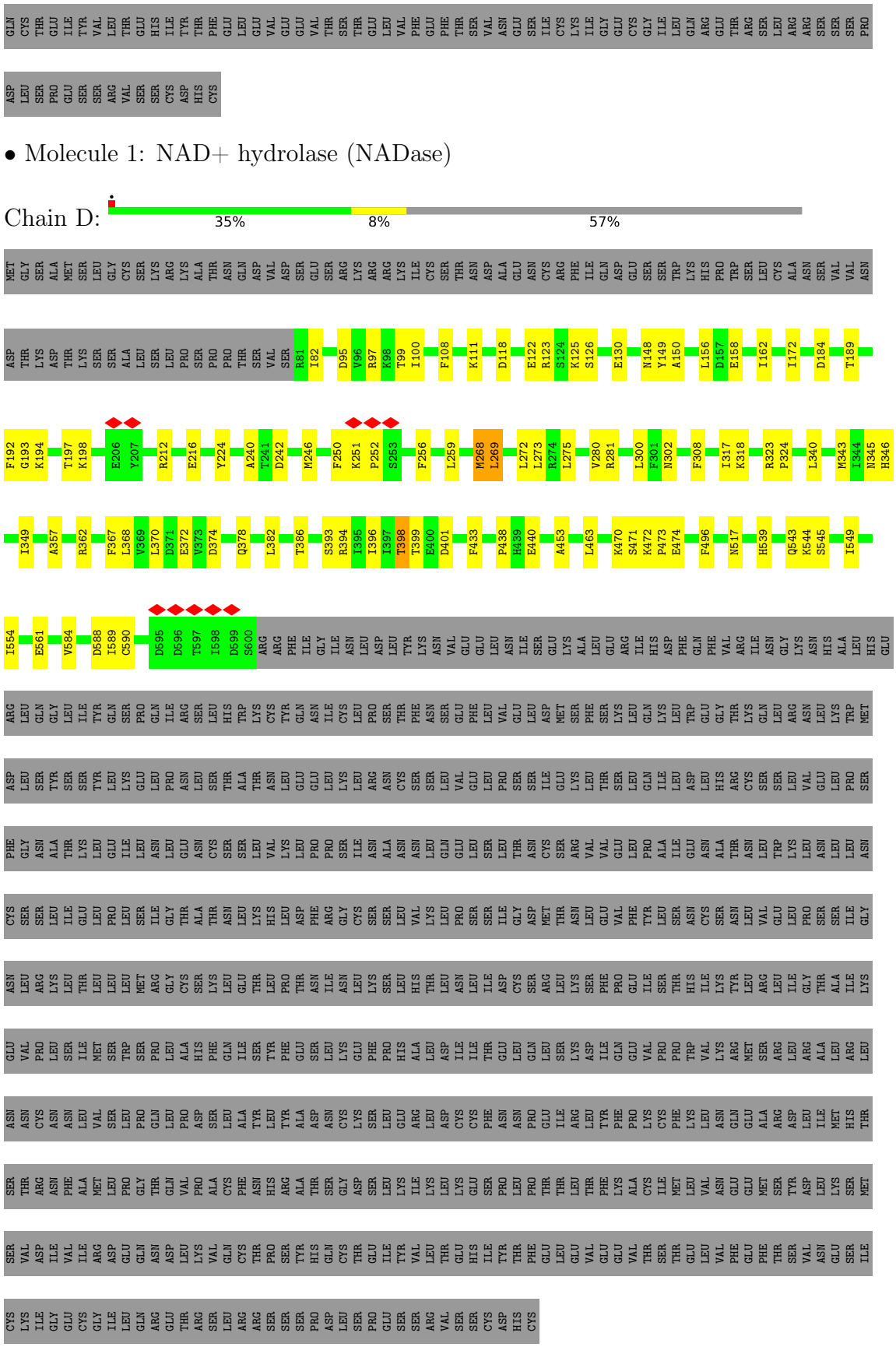
Chain B: 35% 8% 57%





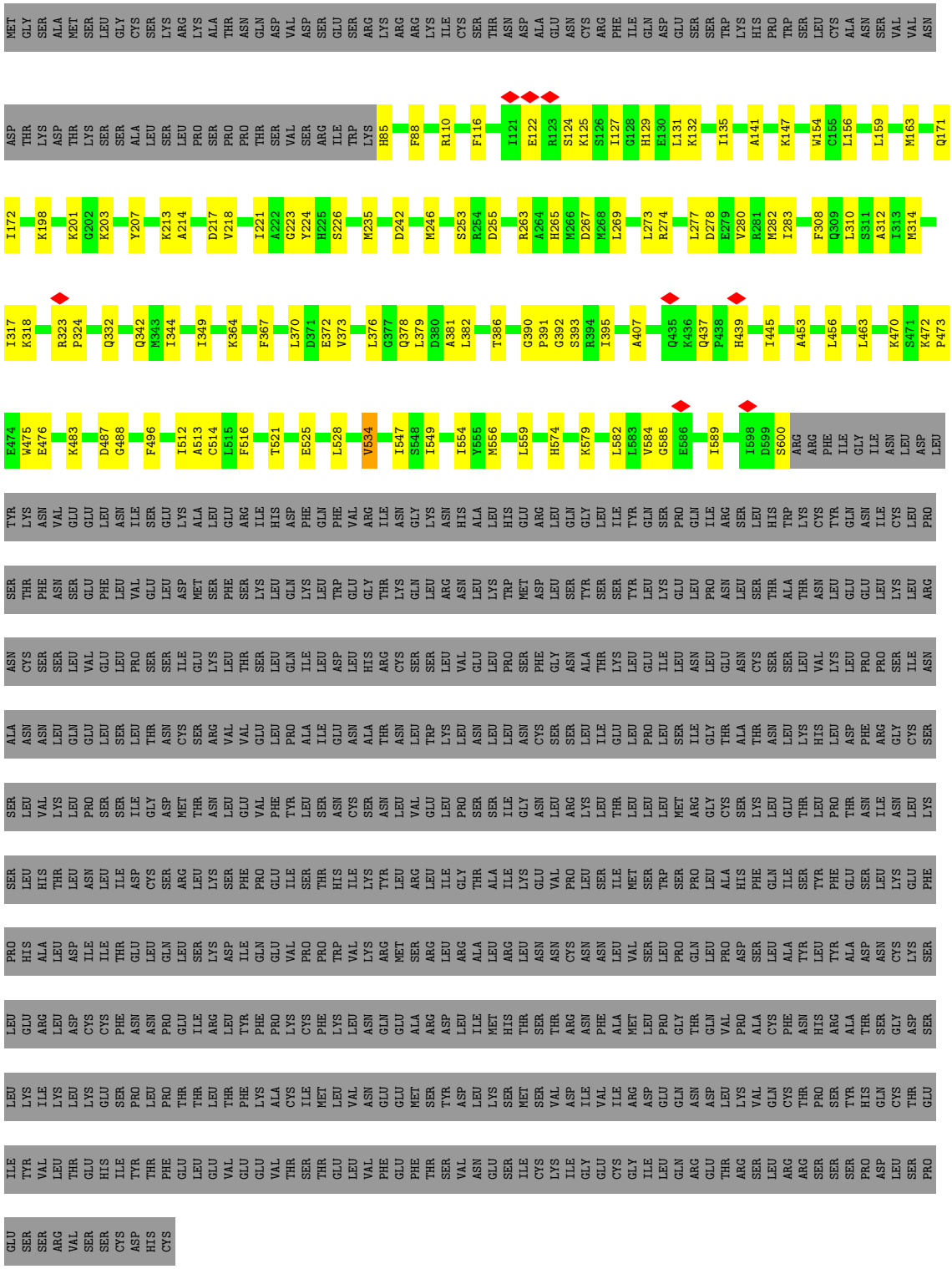
- Molecule 1: NAD+ hydrolase (NADase)

Chain C: 33% 9% 58%


GLN CYS THR GLU ILE TYR VAL LEU THR GLU HIS ILE TYR THR PHE GLU LEU GLU VAL GLU GLU VAL THR SER THR GLU LEU VAL PHE GLU PHE THR SER VAL ASN GLU SER ILE CYS LYS ILE GLY GLU CYS GLY ILE LEU GLN ARG GLU THR ARG SER LEU ARG ARG SER SER PRO
ASP LEU SER PRO GLU SER SER ARG VAL SER SER CYS ASP HIS CYS
• Molecule 1: NAD+ hydrolase (NADase)
Chain D:
35%
8%
57%
MET GLY SER ALA MET SER LEU GLY CYS SER LYS ARG LYS ALA THR ASN GLN ASP VAL ASP SER GLU SER ARG LYS ARG ARG LYS ILE CYS SER THR ASN ASP ALA GLU ASN CYS ARG PHE ILE GLN ASP GLU SER SER TRP LYS HIS PRO TRP SER LEU CYS ALA ASN SER VAL VAL ASN
ASP THR LYS ASP THR LYS SER SER ALA LEU SER LEU PRO SER PRO PRO THR SER VAL SER R81 I82 D95 V96 R97 K98 T99 I100 F108 K111 D118 E122 R123 S124 K125 S126 E130 N148 Y149 A150 L156 D157 E158 I162 I172 D184 T189
F192 G193 K194 T197 K198 E206 Y207 R212 E216 Y224 A240 T241 D242 M246 F250 K251 P252 S253 F256 L259 M268 L269 L272 L273 R274 L275 V280 R281 L300 F301 N302 F308 I317 K318 R323 P324 L340 M343 I344 N345 H346
I349 A357 R362 F367 L368 V369 L370 D371 E372 V373 D374 Q378 L382 T386 S393 R394 I395 I396 I397 T398 T399 E400 D401 F433 P438 H439 E440 A453 L463 K470 S471 K472 P473 E474 F496 N517 H539 Q543 K544 S545 I549
I554 E561 V584 D588 I589 C590 D595 D596 T597 I598 D599 S600 ARG ARG PHE ILE GLY ILE ASN LEU ASP LEU TYR LYS ASN VAL GLU GLU LEU ASN ILE SER GLU LYS ALA LEU GLU ARG ILE HIS ASP PHE GLN PHE VAL ARG ILE ASN GLY LYS ASN HIS ALA LEU HIS GLU
ARG LEU GLN GLY LEU ILE TYR GLN SER PRO GLN ILE ARG SER LEU HIS TRP LYS CYS TYR GLN ASN ILE CYS LEU PRO SER THR PHE ASN SER GLU PHE LEU VAL GLU LEU ASP MET SER PHE SER LYS LEU GLN LYS LEU TRP GLU GLY THR LYS GLN LEU ARG ASN LEU LYS TRP MET
ASP LEU SER TYR SER SER TYR LEU LYS GLU LEU PRO ASN LEU SER THR ALA THR ASN LEU GLU GLU LEU LYS LEU ARG ASN CYS SER SER SER LEU VAL GLU LEU PRO SER SER ILE GLU LYS LEU THR SER LEU GLN ILE LEU LEU ASP LEU HIS ARG CYS SER SER LEU VAL GLU LEU PRO SER
PHE GLY ASN ALA THR LYS LEU GLU ILE LEU ASN LEU GLU ASN CYS SER SER LEU VAL LYS LEU PRO PRO SER ILE ASN ALA ASN ASN LEU GLN GLU LEU SER LEU THR ASN CYS SER ARG VAL VAL GLU LEU PRO ALA ILE GLU ASN ALA THR ASN LEU TRP LYS LEU ASN LEU ASN
CYS SER SER LEU ILE GLU LEU PRO LEU SER ILE GLY THR ALA THR ASN LEU LYS HIS LEU ASP PHE ARG GLY CYS SER SER LEU VAL LYS LEU PRO SER SER ILE GLY ASP MET THR ASN LEU GLU VAL PHE TYR LEU SER ASN CYS SER ASN LEU VAL GLU LEU PRO SER SER ILE GLY
ASN LEU ARG LYS LEU THR LEU LEU LEU MET ARG GLY CYS SER LYS LEU GLU THR LEU PRO THR ASN LEU LYS SER LEU HIS THR LEU ASN LEU ILE ASP CYS SER ARG LEU LYS SER PHE PRO GLU ILE SER THR HIS ILE LYS TYR LEU ARG LEU ILE GLY THR ALA ILE LYS
GLU VAL PRO LEU SER ILE MET SER TRP SER PRO LEU ALA HIS PHE GLN ILE SER TYR PHE GLU SER LEU LYS GLU PHE PRO HIS ALA LEU ASP ILE ILE THR GLU LEU GLN GLU GLU VAL PRO PRO TRP VAL LYS ARG MET SER ARG LEU ARG ALA ILE ARG LEU
ASN ASN CYS ASN ASN LEU VAL SER LEU PRO GLN LEU PRO ASP SER LEU ALA TYR LEU TYR ALA ASP ASN CYS LYS SER LEU GLU ASP CYS CYS PHE ASN ASN PRO GLU ILE ARG LEU TYR PHE PRO LYS CYS PHE LYS LEU ASN GLN GLU GLU ALA ARG ASP LEU ILE MET HIS THR
SER THR ARG ASN PHE ALA MET LEU PRO GLY THR GLN VAL PRO ALA CYS PHE ASN HIS ARG ALA THR SER GLY ASP SER LEU LYS ILE LYS LEU LYS GLU LEU SER PRO LEU PRO THR THR LEU THR PHE LYS ALA CYS ILE MET LEU VAL ASN GLU GLU MET SER TYR ASP LEU LEU ILE LYS SER
SER VAL ASP ILE VAL ILE ARG ASP GLU GLN ASN ASP LEU LYS VAL GLN CYS THR PRO TYR HIS GLN CYS THR GLU ILE TYR VAL LEU THR GLU HIS ILE TYR THR PHE GLU LEU GLU VAL GLU GLU VAL THR SER THR GLU LEU VAL PHE GLU PHE THR SER VAL ASN GLU GLU LEU GLU ILE
CYS LYS ILE GLY GLU CYS GLY ILE LEU GLN ARG GLU THR ARG SER LEU ARG ARG SER SER SER PRO ASP LEU SER PRO GLU SER SER ARG VAL SER SER CYS ASP HIS CYS
• Molecule 1: NAD+ hydrolase (NADase)

Chain A:

33%
9%
58%


MET GLY SER ALA MET SER LEU GLY CYS SER LYS ARG LYS ALA THR ASN GLN ASP VAL ASP SER GLU SER ARG LYS ARG ARG LYS ILE CYS SER THR ASN ASP ALA GLU ASN CYS ARG PHE ILE GLN ASP GLU SER SER TRP LYS HIS PRO TRP SER LEU CYS ALA ASN SER VAL VAL ASN
ASP THR LYS ASP THR LYS SER SER ALA LEU SER LEU PRO SER PRO PRO THR SER VAL SER ARG ILE TRP LYS H85 F88 R110 F116 I121 E122 R123 S124 K125 S126 I127 G128 H129 E130 L131 K132 I135 A141 K147 W154 C155 L156 L159 M163 Q171
I172 K198 K201 G202 K203 Y207 K213 A214 D217 V218 I221 A222 G223 Y224 H225 S226 M235 D242 M246 S253 R254 D255 R263 A264 H265 M266 D267 M268 L269 L273 R274 L277 D278 E279 V280 R281 M282 I283 F308 Q309 L310 S311 A312 I313 M314
I317 K318 R323 P324 Q332 Q342 M343 I344 I349 K364 F367 L370 D371 E372 V373 L376 G377 Q378 L379 D380 A381 L382 T386 G390 P391 G392 S393 R394 I395 A407 Q435 K436 Q437 P438 H439 I445 A453 L456 L463 K470 S471 K472 P473
E474 W475 E476 K483 D487 G488 F496 I512 A513 C514 L515 F516 T521 E525 L528 V534 I547 S548 I549 I554 Y555 M556 L559 H574 K579 L582 L583 V584 G585 E586 I589 I598 D599 S600 ARG ARG PHE ILE GLY ILE ASN LEU ASP LEU
TYR LYS ASN VAL GLU GLU LEU ASN ILE SER GLU LYS ALA LEU GLU ARG ILE HIS ASP PHE GLN PHE VAL ARG ILE ASN GLY LYS ASN HIS ALA LEU HIS GLU ARG LEU GLN GLY LEU ILE TYR GLN SER PRO GLN ILE ARG SER LEU HIS TRP LYS CYS TYR GLN ASN ILE CYS LEU PRO
SER THR PHE ASN SER GLU PHE LEU VAL GLU LEU ASP MET SER PHE SER LYS LEU GLN LYS LEU TRP GLU GLY THR LYS GLN LEU ARG ASN LEU LYS TRP MET ASP LEU SER TYR SER SER TYR LEU LYS GLU LEU PRO ASN LEU SER THR ALA THR ASN LEU GLU GLU GLU LEU LYS LEU ARG
ASN CYS SER SER LEU VAL GLU LEU PRO SER SER ILE GLU LYS LEU THR SER LEU GLN ILE LEU ASP LEU HIS ARG CYS SER SER LEU LEU VAL GLU LEU PRO SER PHE GLY ASN ALA THR LYS LEU LEU GLU ILE LEU ASN LEU GLU ASN CYS SER SER LEU VAL LYS LEU PRO PRO SER ILE ASN
ALA ASN ASN LEU GLN GLU LEU SER LEU THR ASN CYS SER ARG VAL VAL GLU LEU PRO ALA ILE GLU ASN ALA THR ASN LEU TRP LYS LEU ASN LEU LEU ASN CYS SER SER LEU ILE GLU LEU PRO LEU SER ILE GLY THR ALA THR ASN LEU LYS HIS LEU ASP PHE ARG GLY CYS SER
SER LEU VAL LYS LEU PRO SER SER ILE GLY ASP MET THR ASN LEU GLU VAL PHE TYR LEU SER ASN CYS SER ASN LEU VAL GLU LEU PRO SER SER ILE GLY ASN LEU ARG LYS LEU THR LEU LEU LEU MET ARG GLY CYS SER LYS LEU GLU THR LEU PRO LEU SER LYS LEU
SER LEU HIS THR LEU ASN LEU ILE ASP CYS SER ARG LEU PHE PRO GLU ILE SER THR HIS ILE LYS TYR LEU ARG LEU ILE GLY THR ALA ILE LYS GLU VAL PRO LEU SER ILE MET SER TRP SER PRO LEU ALA HIS PHE GLN ILE SER TYR PHE GLU SER LEU LYS GLU PHE
PRO HIS ALA LEU ASP ILE ILE THR GLU LEU GLN LEU SER LYS ASP ILE GLN GLU VAL PRO PRO TRP LYS ARG MET SER ARG LEU ARG ALA LEU ARG ASN ASN ASN CYS ASN ASN ASN PHE ALA LEU VAL SER LEU PRO GLN LEU PRO ASP SER LEU LEU ALA CYS PHE ASN HIS TYR TYR ALA ASP LEU CYS SER
LEU GLU ARG LEU ASP CYS CYS PHE ASN ASN PRO GLU ILE ARG LEU TYR PHE PRO LYS CYS PHE LYS LEU ASN GLN GLU ALA ARG ASP LEU ILE MET HIS THR SER ASN PHE ALA ALA MET LEU PRO GLY THR GLN LEU PRO ALA CYS ASN HIS ARG ALA THR ASN ASP SER ILE GLN VAL PRO ALA CYS ASP SER
LEU LYS ILE LYS LEU LYS GLU SER PRO THR THR LEU THR PHE LYS ALA CYS ILE LEU MET LEU VAL ASN GLU GLU MET SER ASP ASP GLU GLN ASN ASP LEU LYS VAL GLN CYS THR PRO SER TYR ALA HIS ASP SER LEU ALA THR ASP GLN SER
ILE TYR VAL LEU THR GLU HIS ILE TYR THR PHE GLU LEU GLU VAL GLU GLU VAL THR SER THR GLU LEU VAL PHE GLU PHE THR SER VAL ASN GLU SER ILE CYS LYS ILE GLY GLU CYS GLY ILE LEU GLN ARG GLU THR ARG SER LEU LEU ARG ARG SER SER SER PRO ASP SER LEU PRO
GLU SER SER ARG VAL SER SER CYS ASP HIS CYS

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	409348	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	50	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	68.056	Depositor
Minimum map value	-27.724	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	1.000	Depositor
Recommended contour level	8	Depositor
Map size (Å)	395.24402, 395.24402, 395.24402	wwPDB
Map dimensions	360, 360, 360	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.0979, 1.0979, 1.0979	Depositor

5 Model quality (i)

5.1 Standard geometry (i)

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	0.38	0/4207	0.58	1/5660 (0.0%)
1	B	0.36	0/4245	0.54	3/5712 (0.1%)
1	C	0.37	0/4207	0.57	1/5660 (0.0%)
1	D	0.36	0/4245	0.54	3/5712 (0.1%)
All	All	0.37	0/16904	0.56	8/22744 (0.0%)

There are no bond length outliers.

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	590	CYS	N-CA-C	-7.13	105.77	114.75
1	D	590	CYS	N-CA-C	-7.12	105.78	114.75
1	B	398	THR	CB-CA-C	6.18	119.86	109.48
1	D	398	THR	CB-CA-C	6.17	119.84	109.48
1	C	391	PRO	N-CA-C	5.43	119.60	111.14
1	A	391	PRO	N-CA-C	5.41	119.59	111.14
1	B	374	ASP	N-CA-C	-5.23	106.84	113.43
1	D	374	ASP	N-CA-C	-5.23	106.84	113.43

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	4127	0	4163	72	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	B	4163	0	4199	56	0
1	C	4127	0	4163	74	0
1	D	4163	0	4199	57	0
All	All	16580	0	16724	250	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 8.

All (250) 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:C:310:LEU:HD21	1:C:344:ILE:HG22	1.72	0.72
1:D:345:ASN:ND2	1:A:110:ARG:O	2.22	0.71
1:B:345:ASN:ND2	1:C:110:ARG:O	2.22	0.70
1:D:272:LEU:O	1:D:281:ARG:NH1	2.25	0.70
1:B:272:LEU:O	1:B:281:ARG:NH1	2.25	0.69
1:A:310:LEU:HD21	1:A:344:ILE:HG22	1.72	0.69
1:B:318:LYS:O	1:B:323:ARG:NH2	2.25	0.69
1:B:150:ALA:HA	1:B:156:LEU:HD21	1.73	0.69
1:D:150:ALA:HA	1:D:156:LEU:HD21	1.73	0.69
1:D:318:LYS:O	1:D:323:ARG:NH2	2.25	0.69
1:A:122:GLU:HB3	1:A:125:LYS:HB2	1.76	0.68
1:C:122:GLU:HB3	1:C:125:LYS:HB2	1.76	0.67
1:A:280:VAL:HG13	1:A:393:SER:HB2	1.77	0.66
1:B:399:THR:HG22	1:B:401:ASP:H	1.61	0.66
1:C:280:VAL:HG13	1:C:393:SER:HB2	1.77	0.66
1:D:399:THR:HG22	1:D:401:ASP:H	1.61	0.65
1:C:280:VAL:HB	1:C:386:THR:HB	1.79	0.65
1:C:514:CYS:HB3	1:C:584:VAL:HG11	1.80	0.64
1:A:514:CYS:HB3	1:A:584:VAL:HG11	1.80	0.64
1:B:122:GLU:OE1	1:B:125:LYS:NZ	2.29	0.63
1:A:280:VAL:HB	1:A:386:THR:HB	1.79	0.63
1:C:472:LYS:NZ	1:C:476:GLU:OE2	2.31	0.63
1:A:124:SER:O	1:A:125:LYS:HD3	1.99	0.62
1:C:124:SER:O	1:C:125:LYS:HD3	2.00	0.62
1:A:472:LYS:NZ	1:A:476:GLU:OE2	2.31	0.62
1:B:149:TYR:HB3	1:B:192:PHE:HE1	1.64	0.62
1:C:318:LYS:HE3	1:C:496:PHE:HE2	1.65	0.62
1:C:159:LEU:HD11	1:C:218:VAL:HG21	1.81	0.61
1:D:149:TYR:HB3	1:D:192:PHE:HE1	1.64	0.61
1:A:318:LYS:HE3	1:A:496:PHE:HE2	1.65	0.61

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:159:LEU:HD11	1:A:218:VAL:HG21	1.81	0.61
1:D:340:LEU:HD21	1:D:357:ALA:HB2	1.83	0.61
1:A:525:GLU:HA	1:A:534:VAL:HG21	1.83	0.61
1:B:340:LEU:HD21	1:B:357:ALA:HB2	1.83	0.60
1:C:263:ARG:NH2	1:C:267:ASP:OD1	2.35	0.60
1:C:525:GLU:HA	1:C:534:VAL:HG21	1.83	0.59
1:A:263:ARG:NH2	1:A:267:ASP:OD1	2.35	0.59
1:A:318:LYS:HE2	1:A:372:GLU:HG3	1.85	0.59
1:A:453:ALA:HB2	1:A:463:LEU:HD12	1.84	0.59
1:C:453:ALA:HB2	1:C:463:LEU:HD12	1.84	0.58
1:C:318:LYS:HE2	1:C:372:GLU:HG3	1.85	0.58
1:D:453:ALA:HB2	1:D:463:LEU:HD12	1.86	0.57
1:C:574:HIS:CD2	1:C:579:LYS:HG2	2.39	0.57
1:D:323:ARG:HH21	1:D:496:PHE:HZ	1.52	0.57
1:B:453:ALA:HB2	1:B:463:LEU:HD12	1.86	0.57
1:C:456:LEU:HD12	1:C:559:LEU:HD23	1.86	0.57
1:A:213:LYS:NZ	1:A:217:ASP:OD2	2.33	0.57
1:A:456:LEU:HD12	1:A:559:LEU:HD23	1.86	0.56
1:D:122:GLU:OE1	1:D:125:LYS:NZ	2.29	0.56
1:A:574:HIS:CD2	1:A:579:LYS:HG2	2.39	0.56
1:C:223:GLY:O	1:D:123:ARG:NH2	2.38	0.56
1:C:547:ILE:HD11	1:C:554:ILE:HB	1.87	0.56
1:C:514:CYS:HB2	1:C:582:LEU:HD13	1.88	0.55
1:B:323:ARG:HH21	1:B:496:PHE:HZ	1.53	0.55
1:D:470:LYS:HD3	1:D:474:GLU:HB3	1.89	0.55
1:B:82:ILE:HG23	1:A:364:LYS:HA	1.87	0.55
1:A:547:ILE:HD11	1:A:554:ILE:HB	1.87	0.54
1:C:512:ILE:HD13	1:C:547:ILE:HD12	1.89	0.54
1:B:281:ARG:HB2	1:B:394:ARG:HH11	1.73	0.54
1:D:281:ARG:HB2	1:D:394:ARG:HH11	1.73	0.54
1:A:514:CYS:HB2	1:A:582:LEU:HD13	1.88	0.54
1:A:512:ILE:HD13	1:A:547:ILE:HD12	1.89	0.54
1:B:280:VAL:HB	1:B:386:THR:HB	1.90	0.54
1:C:308:PHE:CG	1:C:367:PHE:HB2	2.43	0.54
1:B:470:LYS:HD3	1:B:474:GLU:HB3	1.89	0.54
1:A:308:PHE:CG	1:A:367:PHE:HB2	2.43	0.53
1:D:280:VAL:HB	1:D:386:THR:HB	1.90	0.53
1:B:123:ARG:NH2	1:A:223:GLY:O	2.42	0.53
1:C:221:ILE:HA	1:D:126:SER:HA	1.90	0.53
1:A:370:LEU:HD22	1:A:382:LEU:HD13	1.91	0.53
1:A:487:ASP:OD1	1:A:488:GLY:N	2.42	0.52

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:521:THR:HG22	1:C:554:ILE:HG23	1.92	0.52
1:A:574:HIS:HD2	1:A:579:LYS:HG2	1.74	0.52
1:A:85:HIS:CE1	1:A:116:PHE:HD1	2.27	0.52
1:B:474:GLU:O	1:B:478:THR:OG1	2.20	0.52
1:C:364:LYS:HA	1:D:82:ILE:HG23	1.91	0.52
1:C:370:LEU:HD22	1:C:382:LEU:HD13	1.91	0.52
1:A:521:THR:HG22	1:A:554:ILE:HG23	1.92	0.52
1:A:255:ASP:OD1	1:A:255:ASP:N	2.43	0.52
1:C:487:ASP:OD1	1:C:488:GLY:N	2.42	0.52
1:D:111:LYS:HD2	1:D:240:ALA:HB1	1.91	0.52
1:C:85:HIS:CE1	1:C:116:PHE:HD1	2.27	0.52
1:C:344:ILE:HD11	1:C:349:ILE:HD11	1.92	0.52
1:A:516:PHE:CE2	1:A:528:LEU:HD21	2.45	0.51
1:B:111:LYS:HD2	1:B:240:ALA:HB1	1.91	0.51
1:A:344:ILE:HD11	1:A:349:ILE:HD11	1.92	0.51
1:B:184:ASP:OD1	1:B:189:THR:OG1	2.29	0.51
1:C:224:TYR:OH	1:C:242:ASP:OD2	2.29	0.51
1:C:255:ASP:OD1	1:C:255:ASP:N	2.43	0.51
1:C:574:HIS:HD2	1:C:579:LYS:HG2	1.74	0.51
1:B:280:VAL:HG13	1:B:393:SER:HB2	1.93	0.51
1:C:516:PHE:CE2	1:C:528:LEU:HD21	2.45	0.51
1:A:323:ARG:HB2	1:A:324:PRO:HD3	1.93	0.50
1:A:129:HIS:C	1:A:131:LEU:H	2.20	0.50
1:A:203:LYS:HD2	1:A:207:TYR:HD2	1.76	0.50
1:D:184:ASP:OD1	1:D:189:THR:OG1	2.29	0.50
1:A:224:TYR:OH	1:A:242:ASP:OD2	2.29	0.50
1:C:203:LYS:HD2	1:C:207:TYR:HD2	1.76	0.50
1:A:521:THR:O	1:A:525:GLU:HG3	2.12	0.50
1:C:323:ARG:HB2	1:C:324:PRO:HD3	1.93	0.49
1:C:521:THR:O	1:C:525:GLU:HG3	2.12	0.49
1:B:126:SER:HA	1:A:221:ILE:HA	1.94	0.49
1:A:585:GLY:O	1:A:589:ILE:HG23	2.12	0.49
1:C:129:HIS:C	1:C:131:LEU:H	2.20	0.49
1:C:585:GLY:O	1:C:589:ILE:HG23	2.12	0.49
1:D:280:VAL:HG13	1:D:393:SER:HB2	1.93	0.49
1:A:127:ILE:HD11	1:A:132:LYS:HE3	1.95	0.49
1:C:273:LEU:HD23	1:C:283:ILE:HG13	1.95	0.49
1:C:265:HIS:O	1:C:269:LEU:HD23	2.14	0.48
1:C:214:ALA:O	1:C:218:VAL:HG23	2.13	0.48
1:A:373:VAL:HG11	1:A:379:LEU:HG	1.95	0.48
1:C:127:ILE:HD11	1:C:132:LYS:HE3	1.95	0.48

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:213:LYS:NZ	1:C:217:ASP:OD2	2.33	0.48
1:B:224:TYR:OH	1:B:242:ASP:OD2	2.22	0.48
1:C:373:VAL:HG11	1:C:379:LEU:HG	1.95	0.48
1:D:172:ILE:HG21	1:D:246:MET:SD	2.54	0.47
1:B:346:HIS:HB3	1:B:349:ILE:HD11	1.96	0.47
1:C:376:LEU:HD11	1:C:407:ALA:HB1	1.96	0.47
1:A:376:LEU:HD11	1:A:407:ALA:HB1	1.96	0.47
1:A:214:ALA:O	1:A:218:VAL:HG23	2.13	0.47
1:A:141:ALA:HB2	1:A:171:GLN:NE2	2.30	0.47
1:A:273:LEU:HD23	1:A:283:ILE:HG13	1.95	0.47
1:A:265:HIS:O	1:A:269:LEU:HD23	2.14	0.47
1:D:256:PHE:CD1	1:D:259:LEU:HD11	2.50	0.47
1:B:172:ILE:HG21	1:B:246:MET:SD	2.54	0.47
1:C:88:PHE:CE2	1:C:135:ILE:HG12	2.51	0.46
1:D:517:ASN:ND2	1:D:561:GLU:OE1	2.49	0.46
1:D:281:ARG:HB2	1:D:394:ARG:NH1	2.30	0.46
1:B:256:PHE:CD1	1:B:259:LEU:HD11	2.50	0.46
1:B:281:ARG:HB2	1:B:394:ARG:NH1	2.30	0.46
1:A:88:PHE:CE2	1:A:135:ILE:HG12	2.51	0.46
1:D:588:ASP:N	1:D:588:ASP:OD1	2.49	0.46
1:A:332:GLN:HG2	1:A:381:ALA:HB2	1.98	0.46
1:D:471:SER:OG	1:D:474:GLU:OE1	2.21	0.46
1:C:253:SER:OG	1:C:255:ASP:OD1	2.32	0.46
1:B:517:ASN:ND2	1:B:561:GLU:OE1	2.49	0.46
1:C:141:ALA:HB2	1:C:171:GLN:NE2	2.30	0.46
1:C:483:LYS:HB2	1:C:483:LYS:HE3	1.64	0.46
1:D:346:HIS:HB3	1:D:349:ILE:HD11	1.96	0.46
1:B:556:MET:HE2	1:B:556:MET:HB3	1.81	0.45
1:D:97:ARG:NH2	1:D:118:ASP:OD2	2.48	0.45
1:C:124:SER:C	1:C:125:LYS:HD3	2.41	0.45
1:A:124:SER:C	1:A:125:LYS:HD3	2.41	0.45
1:B:158:GLU:O	1:B:162:ILE:HG13	2.16	0.45
1:D:268:MET:HB2	1:D:268:MET:HE2	1.60	0.45
1:A:127:ILE:HG22	1:A:154:TRP:CD1	2.52	0.45
1:D:158:GLU:O	1:D:162:ILE:HG13	2.16	0.45
1:C:274:ARG:NH2	1:C:277:LEU:HD11	2.32	0.45
1:D:539:HIS:O	1:D:543:GLN:HG2	2.17	0.45
1:A:253:SER:OG	1:A:255:ASP:OD1	2.32	0.45
1:B:256:PHE:HE2	1:B:302:ASN:OD1	1.99	0.45
1:D:300:LEU:HD21	1:D:396:ILE:HD13	1.98	0.45
1:A:470:LYS:HB2	1:A:475:TRP:NE1	2.32	0.45

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:273:LEU:HD23	1:B:275:LEU:HD21	1.98	0.45
1:A:274:ARG:NH2	1:A:277:LEU:HD11	2.32	0.45
1:C:332:GLN:HG2	1:C:381:ALA:HB2	1.98	0.45
1:B:588:ASP:OD1	1:B:588:ASP:N	2.49	0.44
1:C:127:ILE:HG22	1:C:154:TRP:CD1	2.52	0.44
1:D:256:PHE:HE2	1:D:302:ASN:OD1	1.99	0.44
1:D:370:LEU:HD22	1:D:382:LEU:HD13	1.99	0.44
1:B:108:PHE:HE1	1:B:240:ALA:HA	1.83	0.44
1:D:108:PHE:HE1	1:D:240:ALA:HA	1.83	0.44
1:B:343:MET:HE1	1:B:368:LEU:HB2	1.98	0.44
1:D:343:MET:HE1	1:D:368:LEU:HB2	1.98	0.44
1:B:370:LEU:HD22	1:B:382:LEU:HD13	1.99	0.44
1:D:273:LEU:HD23	1:D:275:LEU:HD21	1.98	0.44
1:B:99:THR:OG1	1:B:100:ILE:N	2.50	0.44
1:B:539:HIS:O	1:B:543:GLN:HG2	2.17	0.44
1:C:470:LYS:HB2	1:C:475:TRP:NE1	2.32	0.44
1:A:172:ILE:HG21	1:A:246:MET:SD	2.58	0.44
1:B:300:LEU:HD21	1:B:396:ILE:HD13	1.98	0.44
1:A:312:ALA:HB1	1:A:342:GLN:HG2	1.99	0.44
1:A:198:LYS:O	1:A:201:LYS:NZ	2.45	0.44
1:C:312:ALA:HB1	1:C:342:GLN:HG2	1.99	0.44
1:D:549:ILE:HG12	1:D:554:ILE:HG22	2.00	0.44
1:D:224:TYR:OH	1:D:242:ASP:OD2	2.22	0.43
1:B:97:ARG:NH2	1:B:118:ASP:OD2	2.48	0.43
1:C:198:LYS:O	1:C:201:LYS:NZ	2.45	0.43
1:C:172:ILE:HG21	1:C:246:MET:SD	2.58	0.43
1:A:314:MET:HE3	1:A:314:MET:HB3	1.90	0.43
1:B:399:THR:HG22	1:B:401:ASP:N	2.32	0.43
1:C:122:GLU:HB3	1:C:125:LYS:HE2	2.00	0.43
1:A:513:ALA:HB2	1:A:556:MET:HE1	2.01	0.43
1:B:212:ARG:O	1:B:216:GLU:OE1	2.37	0.43
1:B:549:ILE:HG12	1:B:554:ILE:HG22	2.00	0.43
1:D:99:THR:OG1	1:D:100:ILE:N	2.50	0.43
1:C:280:VAL:HG22	1:C:390:GLY:O	2.19	0.42
1:B:250:PHE:CD2	1:B:252:PRO:HD3	2.54	0.42
1:C:282:MET:HG2	1:C:395:ILE:HB	2.00	0.42
1:D:212:ARG:O	1:D:216:GLU:OE1	2.37	0.42
1:D:250:PHE:CD2	1:D:252:PRO:HD3	2.54	0.42
1:B:379:LEU:HD23	1:B:379:LEU:HA	1.87	0.42
1:B:584:VAL:O	1:B:589:ILE:HD13	2.19	0.42
1:C:532:LEU:HD23	1:C:532:LEU:HA	1.86	0.42

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:269:LEU:HD12	1:D:269:LEU:HA	1.84	0.42
1:D:544:LYS:O	1:D:545:SER:OG	2.34	0.42
1:A:364:LYS:HE2	1:A:364:LYS:HB3	1.86	0.42
1:C:308:PHE:CD2	1:C:367:PHE:HB2	2.54	0.42
1:C:340:LEU:HD12	1:C:340:LEU:HA	1.88	0.42
1:A:122:GLU:HB3	1:A:125:LYS:HE2	2.00	0.42
1:D:126:SER:O	1:D:130:GLU:HG2	2.19	0.42
1:A:280:VAL:HG22	1:A:390:GLY:O	2.20	0.42
1:A:282:MET:HG2	1:A:395:ILE:HB	2.00	0.42
1:C:473:PRO:HA	1:C:476:GLU:OE1	2.20	0.42
1:D:584:VAL:O	1:D:589:ILE:HD13	2.19	0.42
1:A:308:PHE:CD2	1:A:367:PHE:HB2	2.54	0.42
1:D:323:ARG:HB2	1:D:324:PRO:HD3	2.02	0.41
1:C:278:ASP:HA	1:C:392:GLY:HA2	2.02	0.41
1:C:317:ILE:HG22	1:C:378:GLN:NE2	2.35	0.41
1:C:549:ILE:HG12	1:C:554:ILE:HG22	2.02	0.41
1:A:226:SER:HA	1:A:235:MET:HE2	2.02	0.41
1:A:473:PRO:HA	1:A:476:GLU:OE1	2.20	0.41
1:B:126:SER:O	1:B:130:GLU:HG2	2.19	0.41
1:B:323:ARG:HB2	1:B:324:PRO:HD3	2.02	0.41
1:B:440:GLU:OE1	1:B:440:GLU:N	2.52	0.41
1:D:472:LYS:HB2	1:D:473:PRO:HD3	2.02	0.41
1:C:513:ALA:HB2	1:C:556:MET:HE1	2.01	0.41
1:A:317:ILE:HG22	1:A:378:GLN:NE2	2.35	0.41
1:C:226:SER:HA	1:C:235:MET:HE2	2.02	0.41
1:C:147:LYS:HE2	1:C:147:LYS:HB2	1.66	0.41
1:D:193:GLY:O	1:D:197:THR:HG23	2.21	0.41
1:D:317:ILE:HG22	1:D:378:GLN:HG2	2.02	0.41
1:B:433:PHE:CD2	1:B:438:PRO:HA	2.56	0.41
1:C:163:MET:HE2	1:C:217:ASP:HB3	2.03	0.41
1:D:440:GLU:OE1	1:D:440:GLU:N	2.52	0.41
1:A:156:LEU:HD23	1:A:156:LEU:HA	1.94	0.41
1:A:278:ASP:HA	1:A:392:GLY:HA2	2.02	0.41
1:D:194:LYS:O	1:D:198:LYS:HD3	2.21	0.41
1:A:549:ILE:HG12	1:A:554:ILE:HG22	2.02	0.41
1:A:600:SER:O	1:A:600:SER:OG	2.36	0.41
1:C:450:MET:HE2	1:C:450:MET:HB3	1.90	0.40
1:D:318:LYS:HE2	1:D:372:GLU:HG2	2.03	0.40
1:D:433:PHE:CD2	1:D:438:PRO:HA	2.56	0.40
1:B:317:ILE:HG22	1:B:378:GLN:HG2	2.02	0.40
1:D:250:PHE:CG	1:D:251:LYS:N	2.89	0.40

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:147:LYS:HE2	1:A:147:LYS:HB2	1.66	0.40
1:B:194:LYS:O	1:B:198:LYS:HD3	2.21	0.40
1:B:318:LYS:HE2	1:B:372:GLU:HG2	2.03	0.40
1:D:308:PHE:CG	1:D:367:PHE:HB2	2.57	0.40
1:A:163:MET:HE2	1:A:217:ASP:HB3	2.03	0.40
1:C:600:SER:O	1:C:600:SER:OG	2.37	0.40
1:D:95:ASP:OD2	1:D:148:ASN:HB2	2.22	0.40
1:B:250:PHE:CG	1:B:251:LYS:N	2.89	0.40
1:B:254:ARG:HG3	1:B:255:ASP:H	1.86	0.40
1:B:308:PHE:CG	1:B:367:PHE:HB2	2.57	0.40
1:B:470:LYS:HB3	1:B:474:GLU:HB2	2.04	0.40
1:B:472:LYS:HB2	1:B:473:PRO:HD3	2.02	0.40
1:C:470:LYS:HB2	1:C:475:TRP:CD1	2.56	0.40
1:C:577:TYR:CE1	1:D:589:ILE:HG13	2.56	0.40
1:A:483:LYS:HB2	1:A:483:LYS:HE3	1.64	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	514/1221 (42%)	486 (95%)	28 (5%)	0	100	100
1	B	518/1221 (42%)	487 (94%)	31 (6%)	0	100	100
1	C	514/1221 (42%)	486 (95%)	28 (5%)	0	100	100
1	D	518/1221 (42%)	487 (94%)	31 (6%)	0	100	100
All	All	2064/4884 (42%)	1946 (94%)	118 (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	450/1114 (40%)	446 (99%)	4 (1%)	75	89
1	B	453/1114 (41%)	449 (99%)	4 (1%)	75	89
1	C	450/1114 (40%)	446 (99%)	4 (1%)	75	89
1	D	453/1114 (41%)	449 (99%)	4 (1%)	75	89
All	All	1806/4456 (40%)	1790 (99%)	16 (1%)	74	89

All (16) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	268	MET
1	B	269	LEU
1	B	362	ARG
1	B	398	THR
1	C	437	GLN
1	C	439	HIS
1	C	445	ILE
1	C	534	VAL
1	D	268	MET
1	D	269	LEU
1	D	362	ARG
1	D	398	THR
1	A	437	GLN
1	A	439	HIS
1	A	445	ILE
1	A	534	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (15) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	334	GLN
1	B	342	GLN
1	B	431	ASN

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	C	85	HIS
1	C	86	GLN
1	C	225	HIS
1	C	581	GLN
1	D	334	GLN
1	D	342	GLN
1	D	431	ASN
1	A	85	HIS
1	A	86	GLN
1	A	225	HIS
1	A	378	GLN
1	A	581	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)

There are no ligands in this entry.

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.

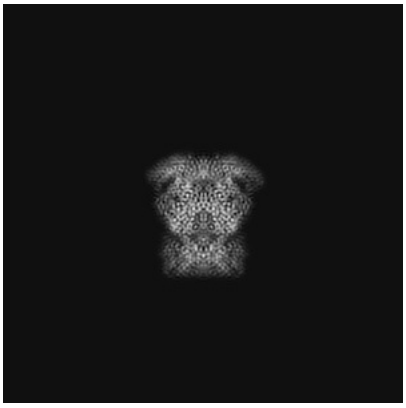
6 Map visualisation (i)

This section contains visualisations of the EMDB entry EMD-30579. These allow visual inspection of the internal detail of the map and identification of artifacts.

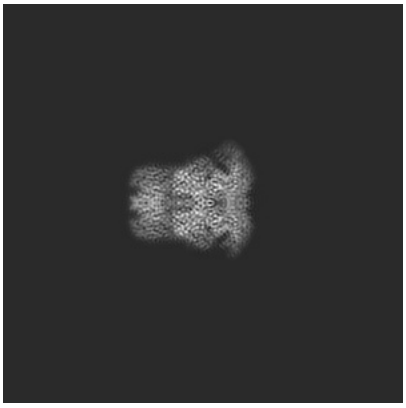
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections (i)

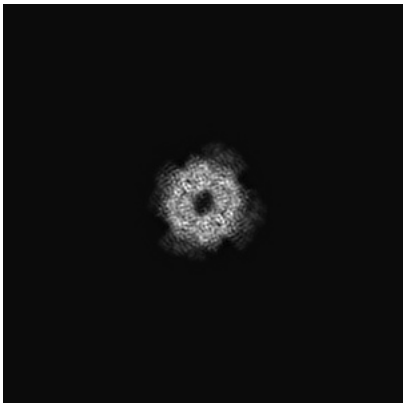
6.1.1 Primary map



X



Y



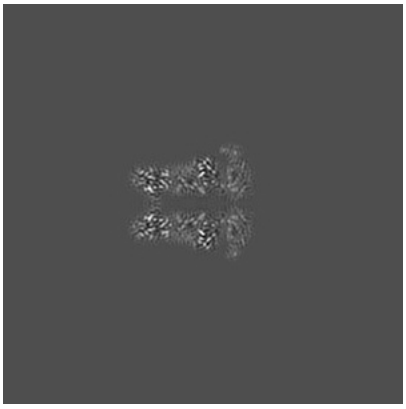
Z

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

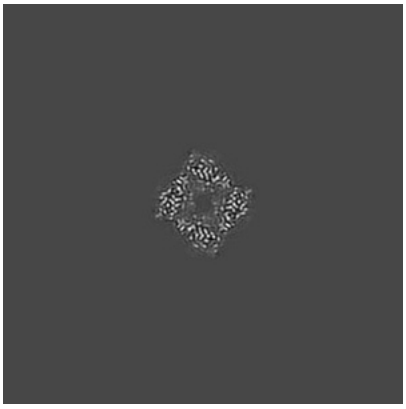
6.2 Central slices (i)

6.2.1 Primary map

X Index: 180



Y Index: 180

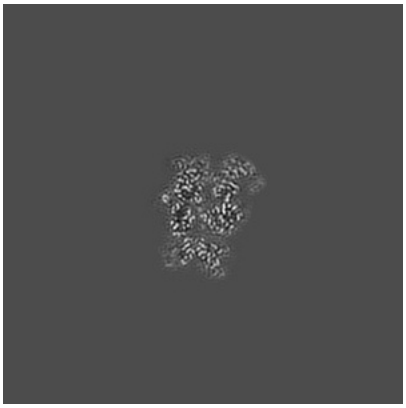


Z Index: 180

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

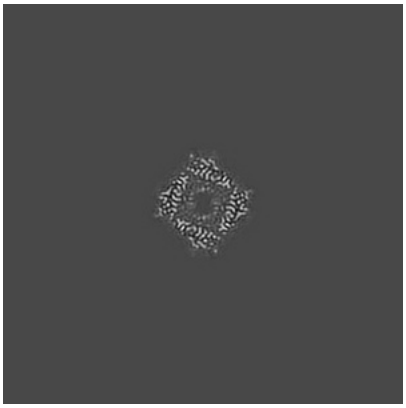
6.3 Largest variance slices (i)

6.3.1 Primary map



X Index: 195

Y Index: 162

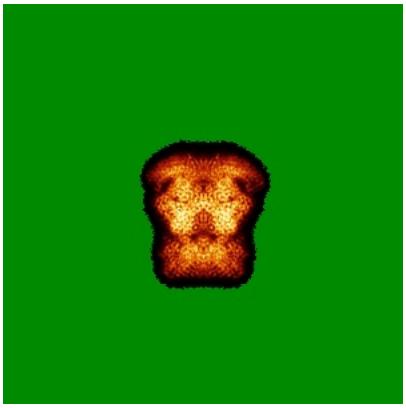


Z Index: 179

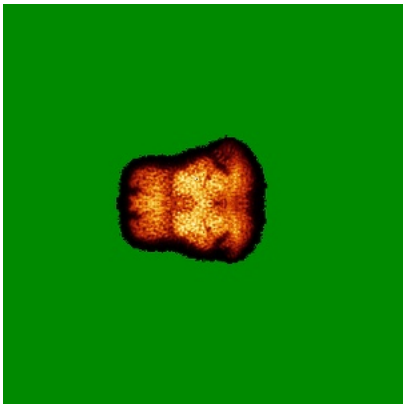
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color) (i)

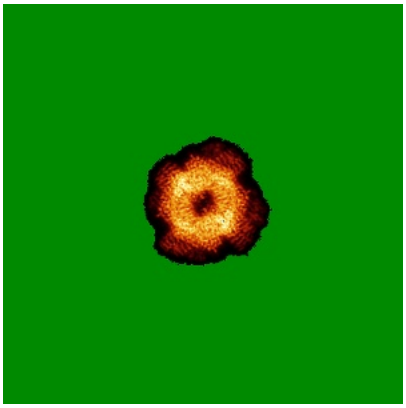
6.4.1 Primary map



X



Y



Z

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

6.5 Orthogonal surface views (i)

6.5.1 Primary map

X Y Z

The images above show the 3D surface view of the map at the recommended contour level 8.0. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

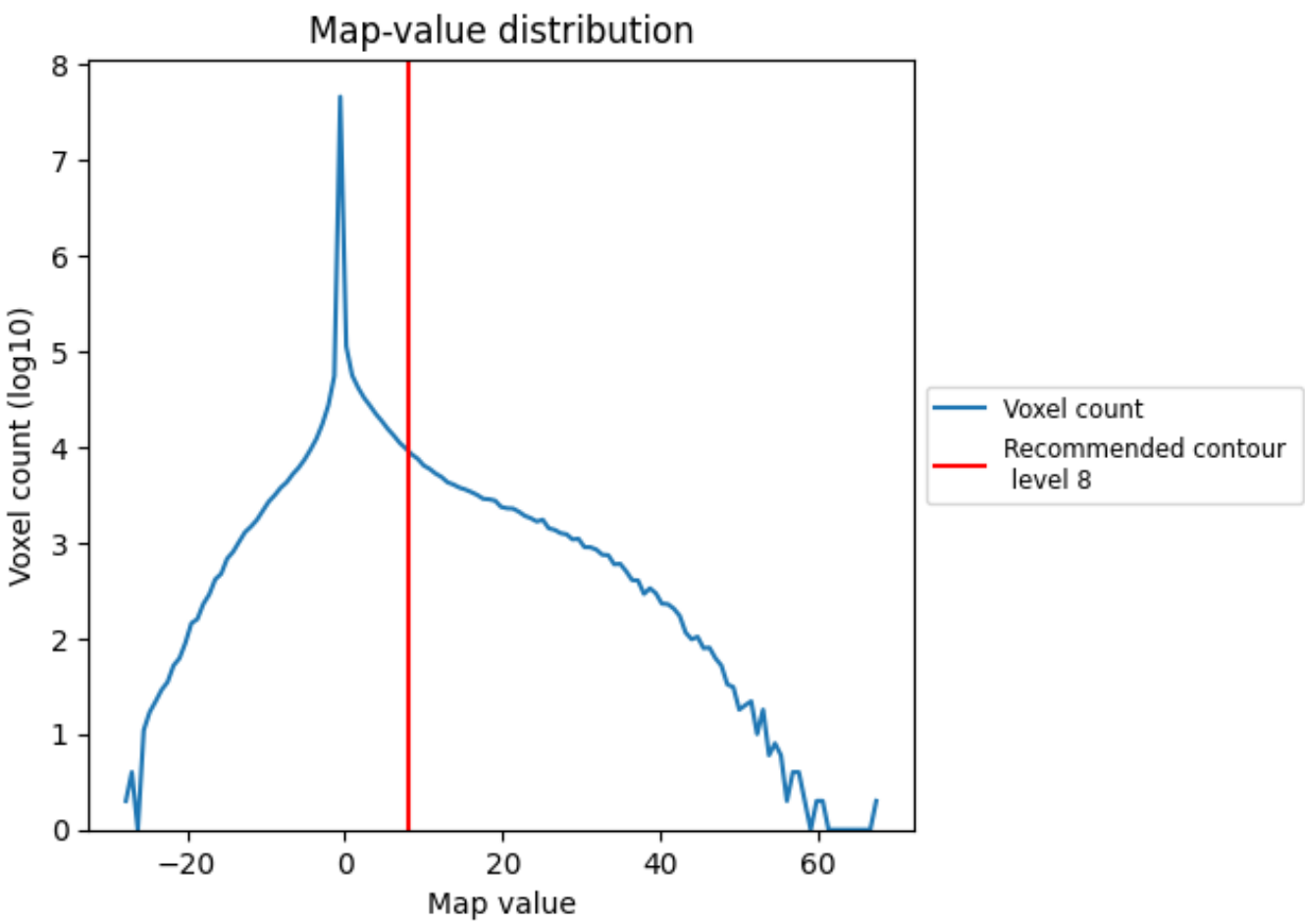
6.6 Mask visualisation (i)

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

7 Map analysis (i)

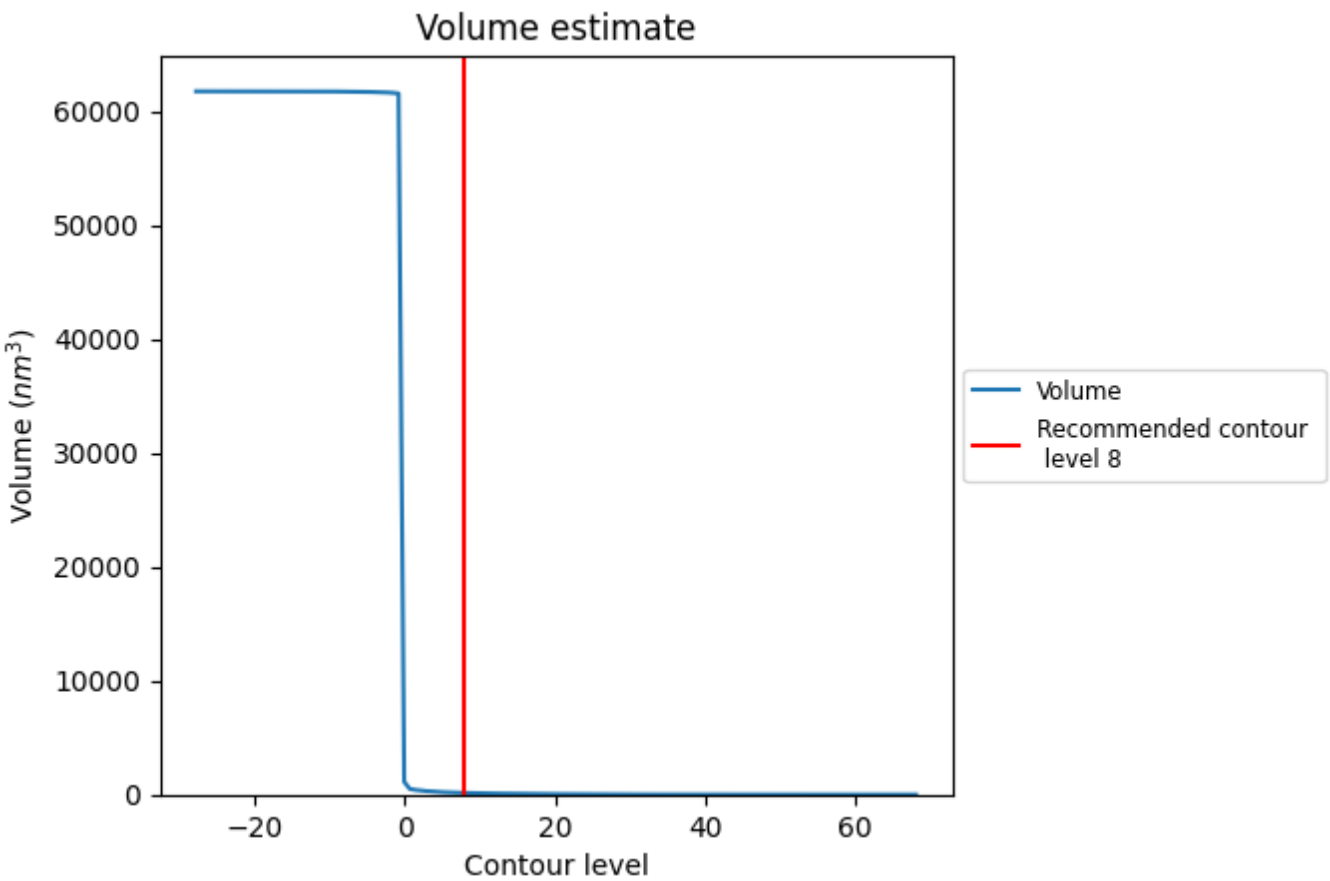
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution (i)



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

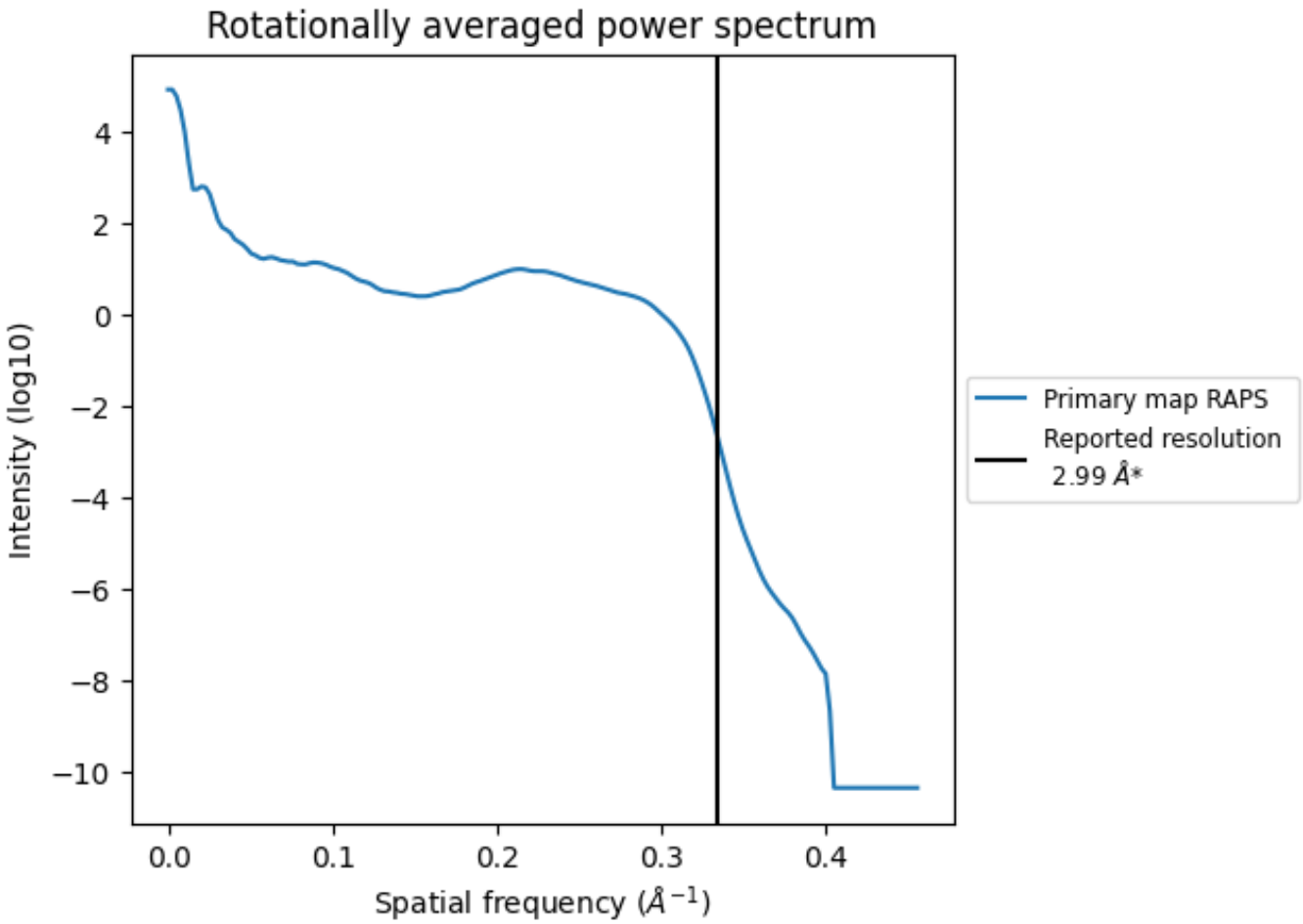
7.2 Volume estimate (i)



The volume at the recommended contour level is 143 nm^3; this corresponds to an approximate mass of 129 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 0.334 Å^{-1}

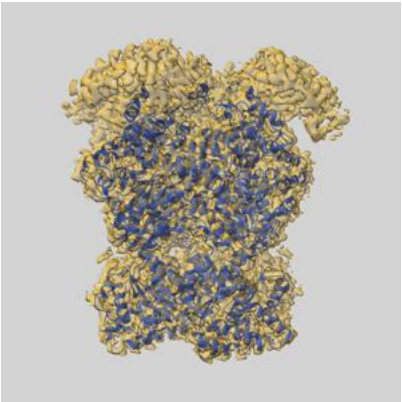
8 Fourier-Shell correlation (i)

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

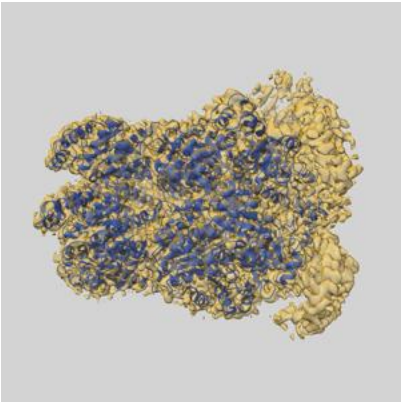
9 Map-model fit (i)

This section contains information regarding the fit between EMDB map EMD-30579 and PDB model 7DFV. Per-residue inclusion information can be found in section 3 on page 4.

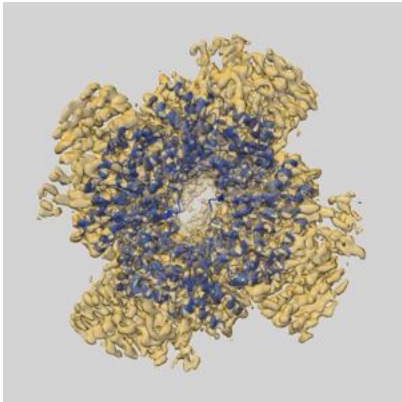
9.1 Map-model overlay (i)



X



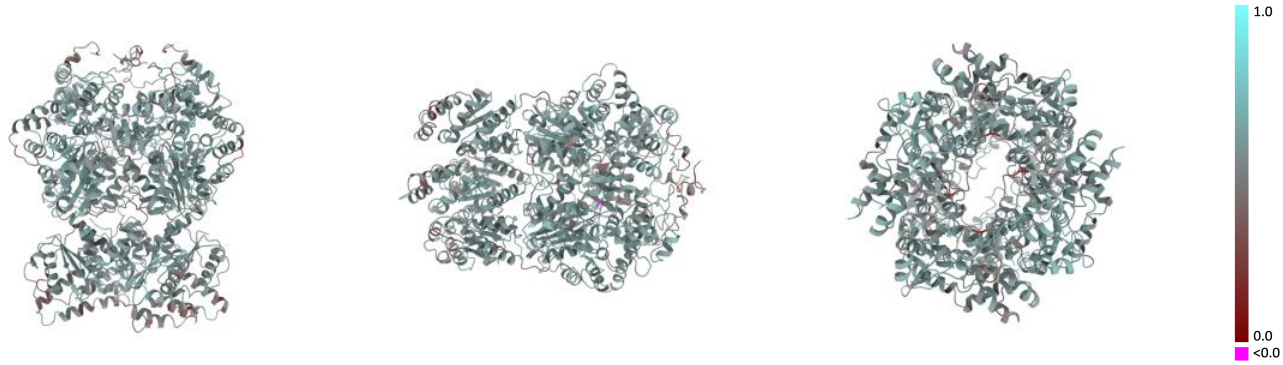
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 8.0 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.

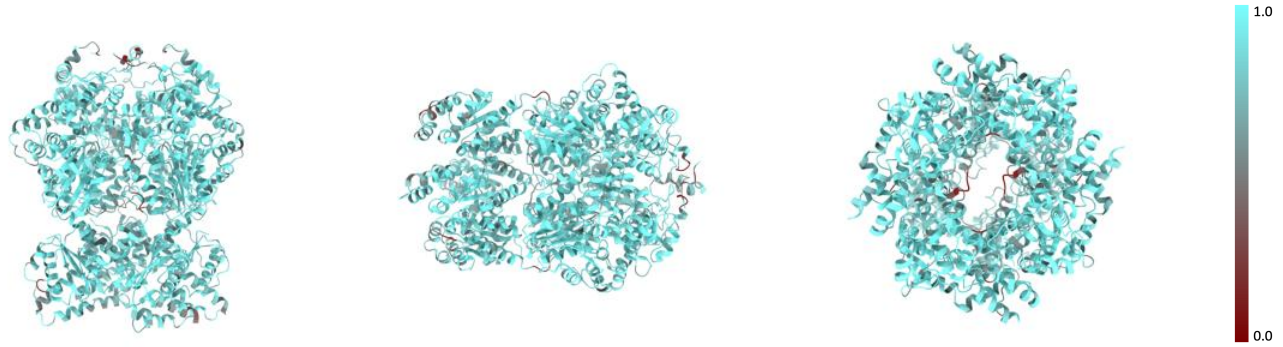
9.2 Q-score mapped to coordinate model (i)



X Y Z

The images above show the model with each residue coloured according 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.

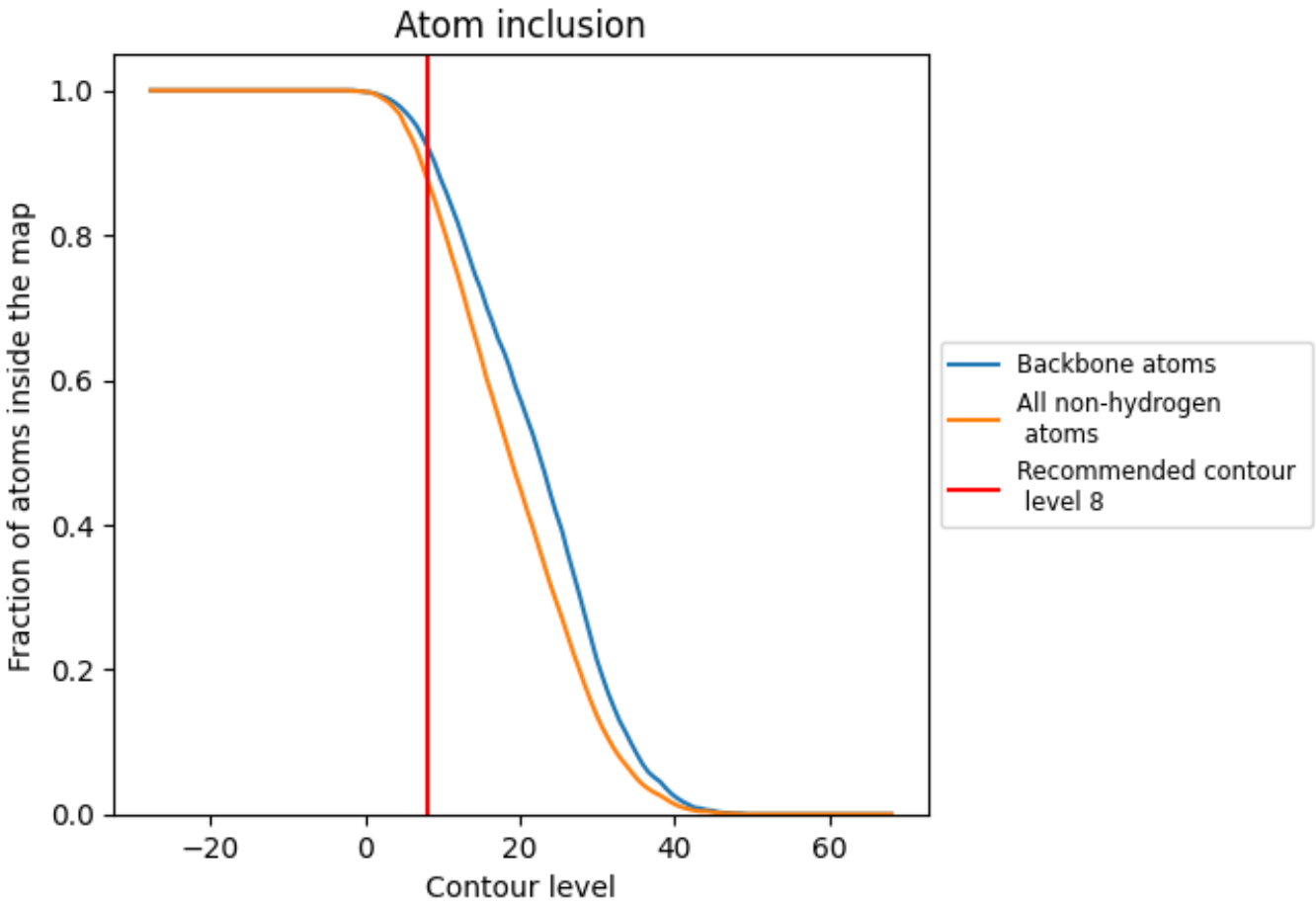
9.3 Atom inclusion mapped to coordinate model (i)



X Y Z

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 (8).

9.4 Atom inclusion (i)



At the recommended contour level, 92% of all backbone atoms, 88% 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 (8) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8780	0.5490
A	0.8730	0.5400
B	0.8840	0.5590
C	0.8740	0.5410
D	0.8820	0.5560