

Assessment of EMA in CASP14-COVID

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CASP-COVID EMA Statistics

Targets with released structures: C1905 and C1908 (=T1064)

Number of models ($N\{GDT \geq 40\}$)

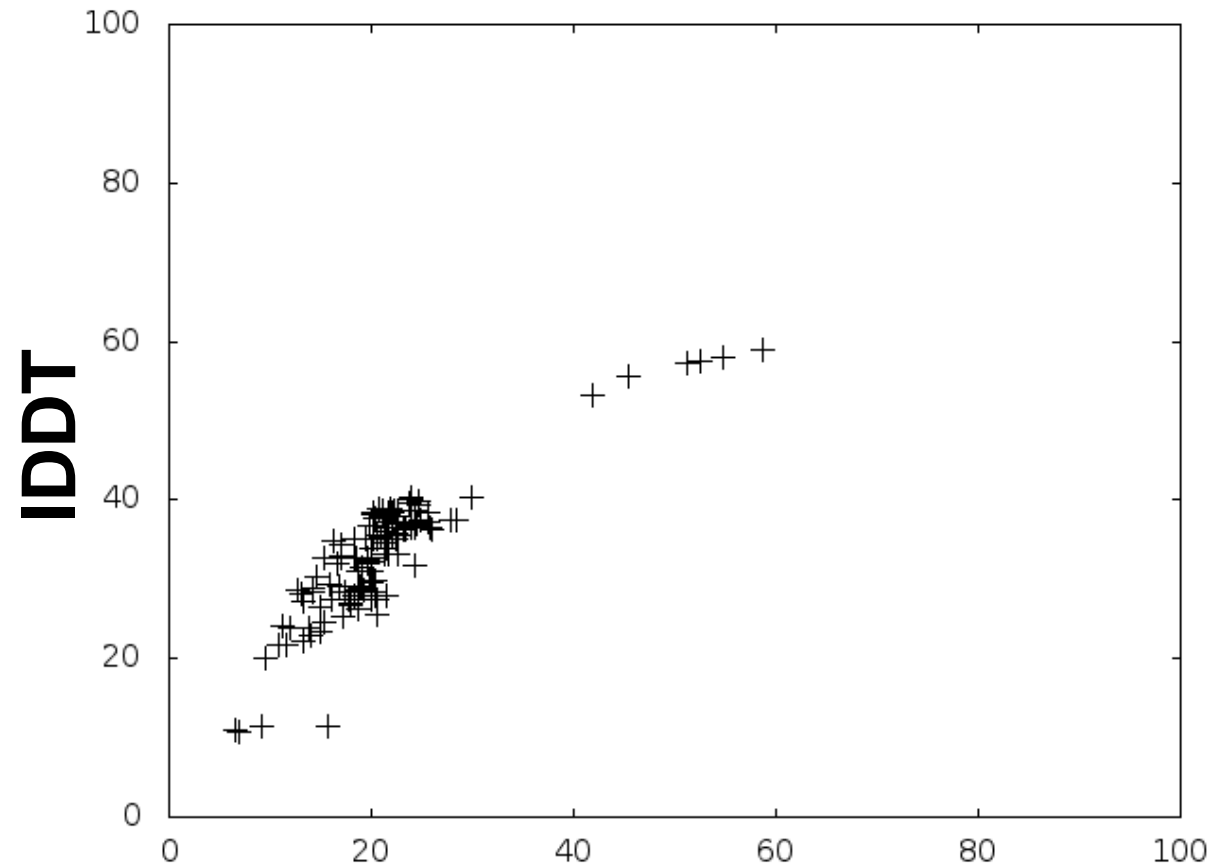
Targets	C1905	C1905-D1	C1905-D2	C1908
CASP-COVID	153 (6) [5 AF1]	83 (38) [0 AF]	79 (0) [0 AF]	181 (0) [0 AF]
Post-analysis		+ 5 AF1 (5)	+ 5 AF1 (5)	+ 5 AF2 (5)

Number of QA groups

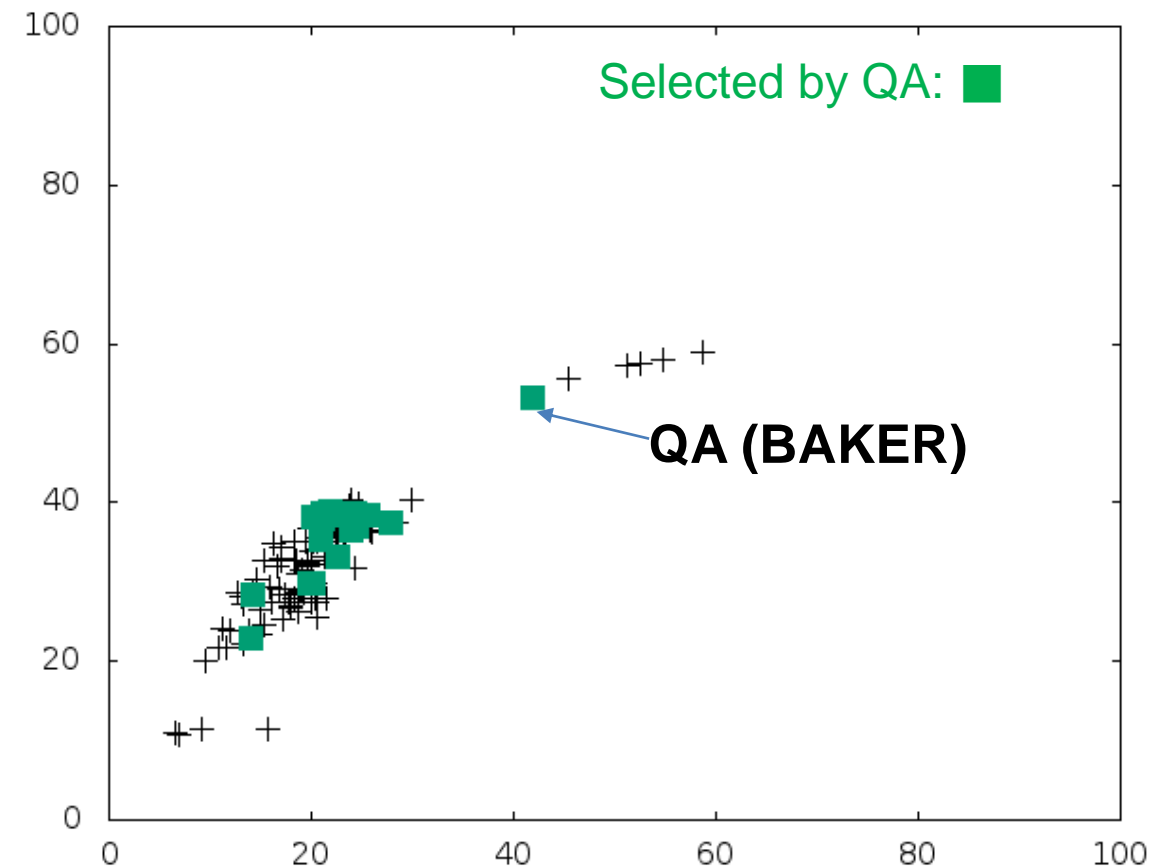
	Full	Domain
CASP-COVID	29/12	19/10
Post-analysis	10/10	10/10

1. C1905

Modeling results

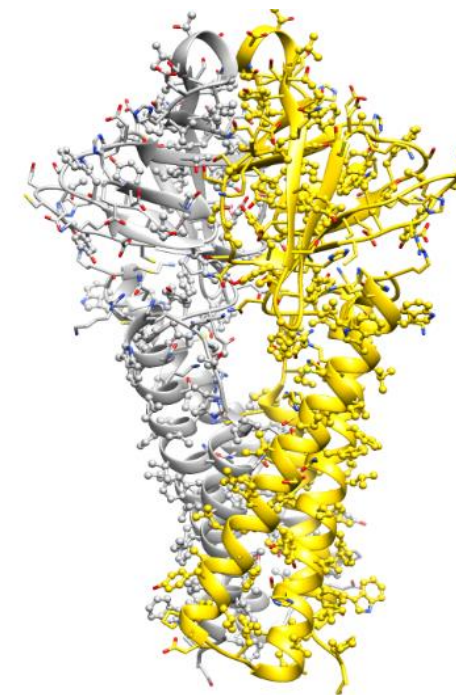
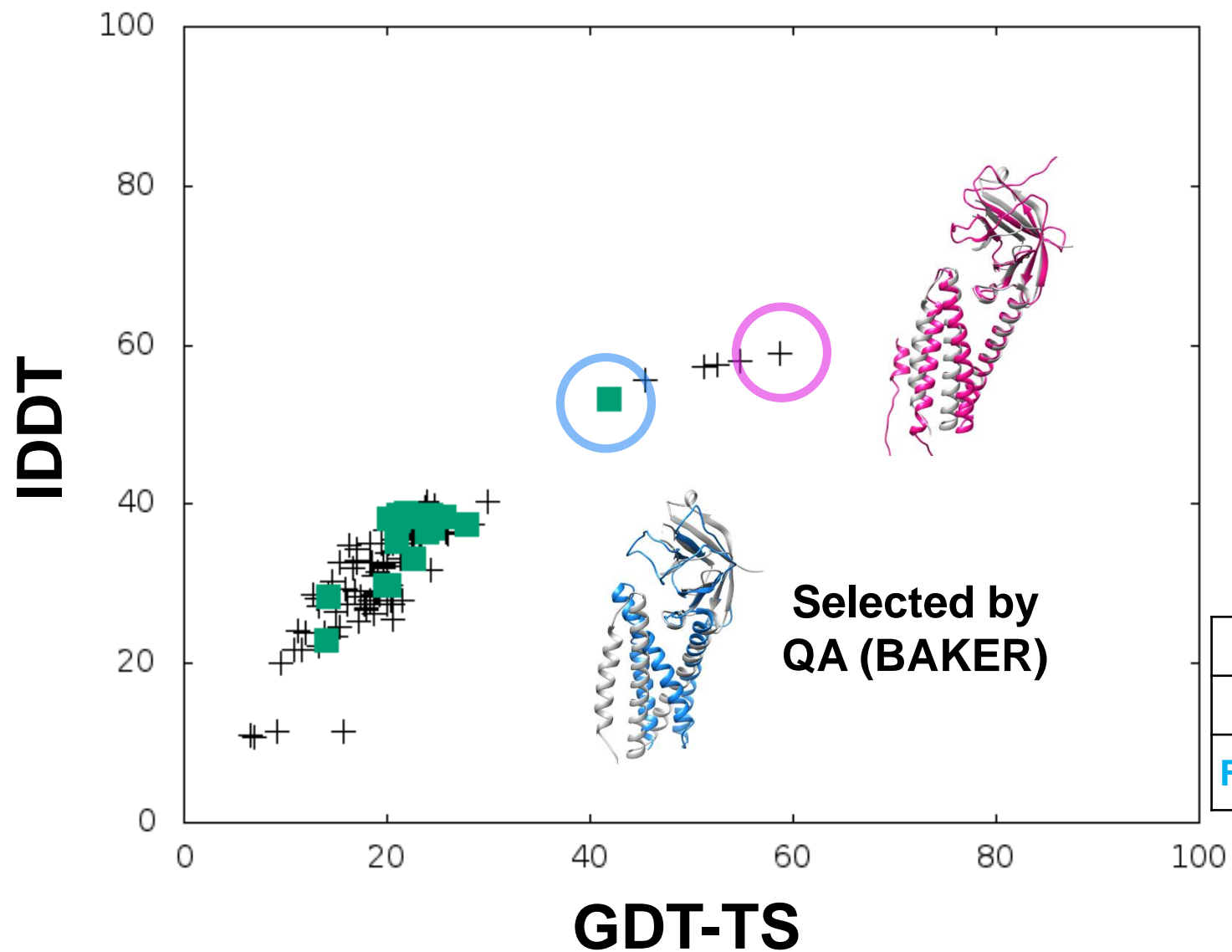


QA results



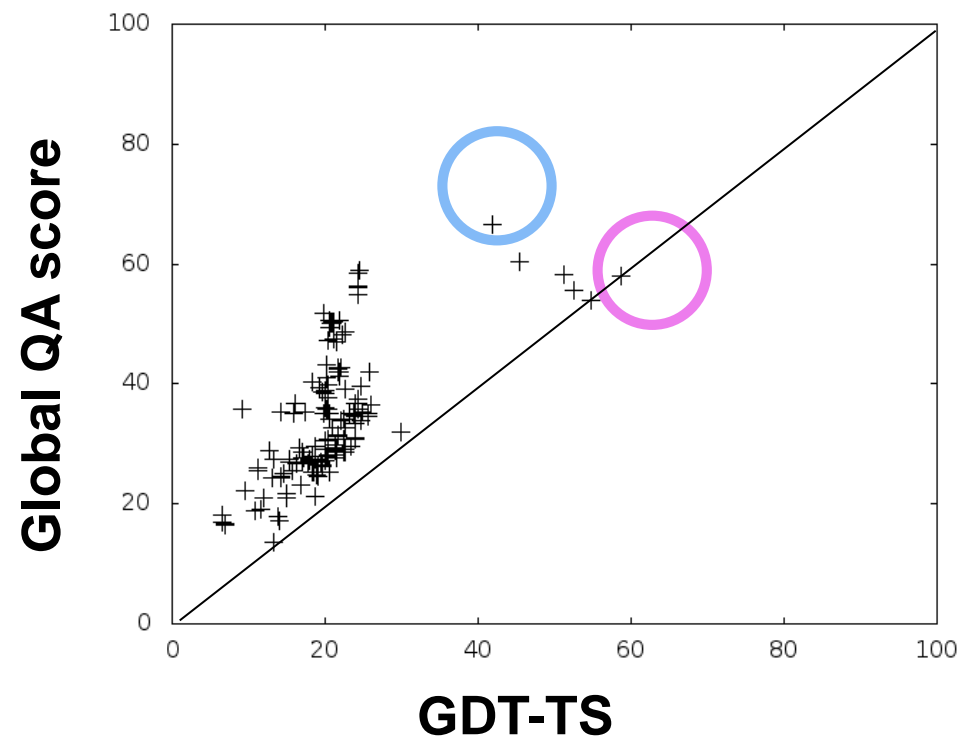
GDT-TS

QA results (C1905)



	GDT-TS	IDDT	MolP
AF1_2	59	59	2.0
FEIGLAB-R	42	43	1.2

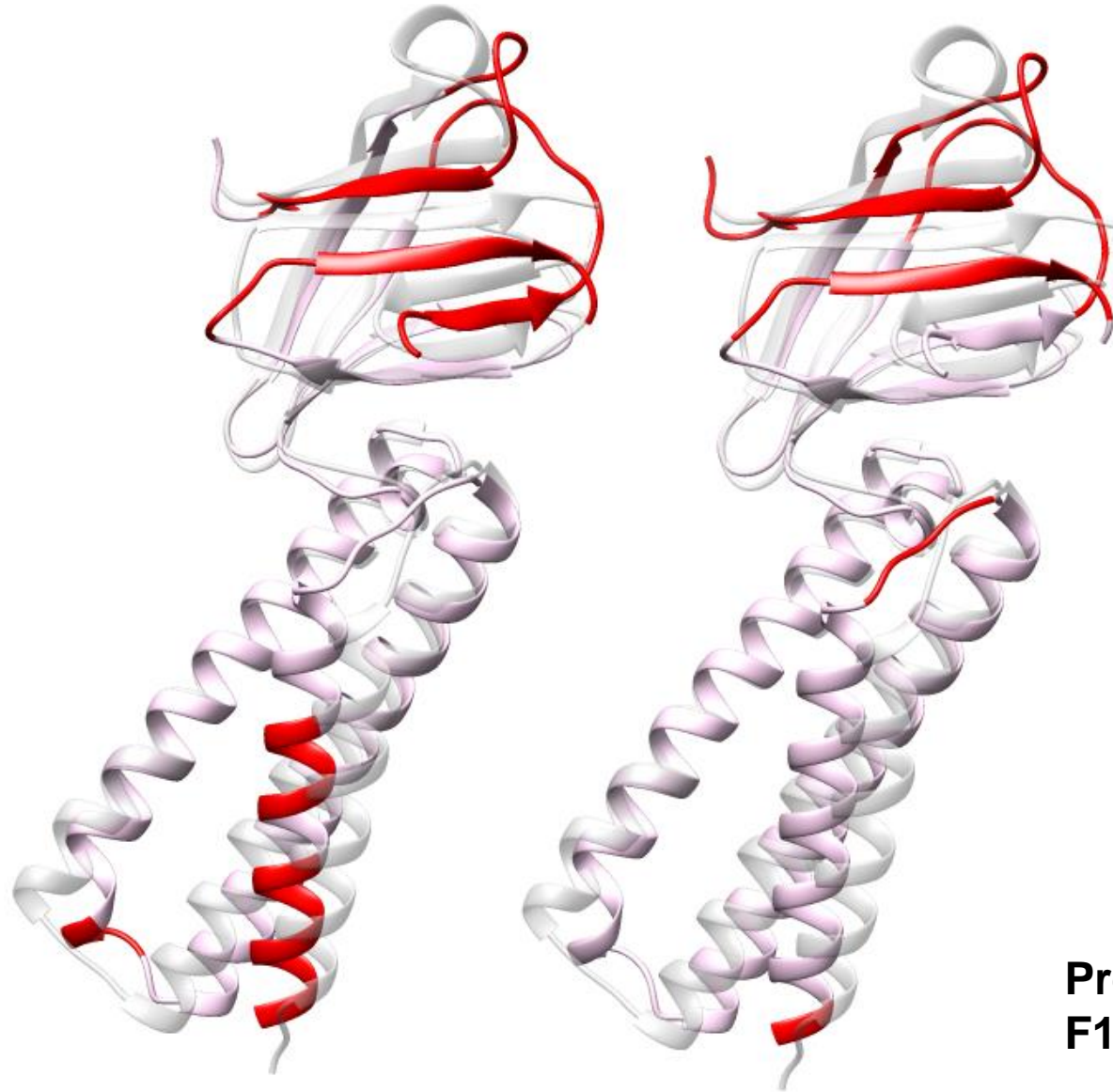
Global QA: BAKER



Local QA: BAKER

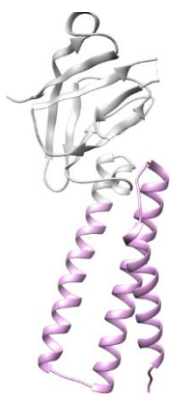
	ASE	AUC	ULR F1
AF1_2	71	89	0.2
FEIGLAB-R	51	65	0.2

C1905: ULR



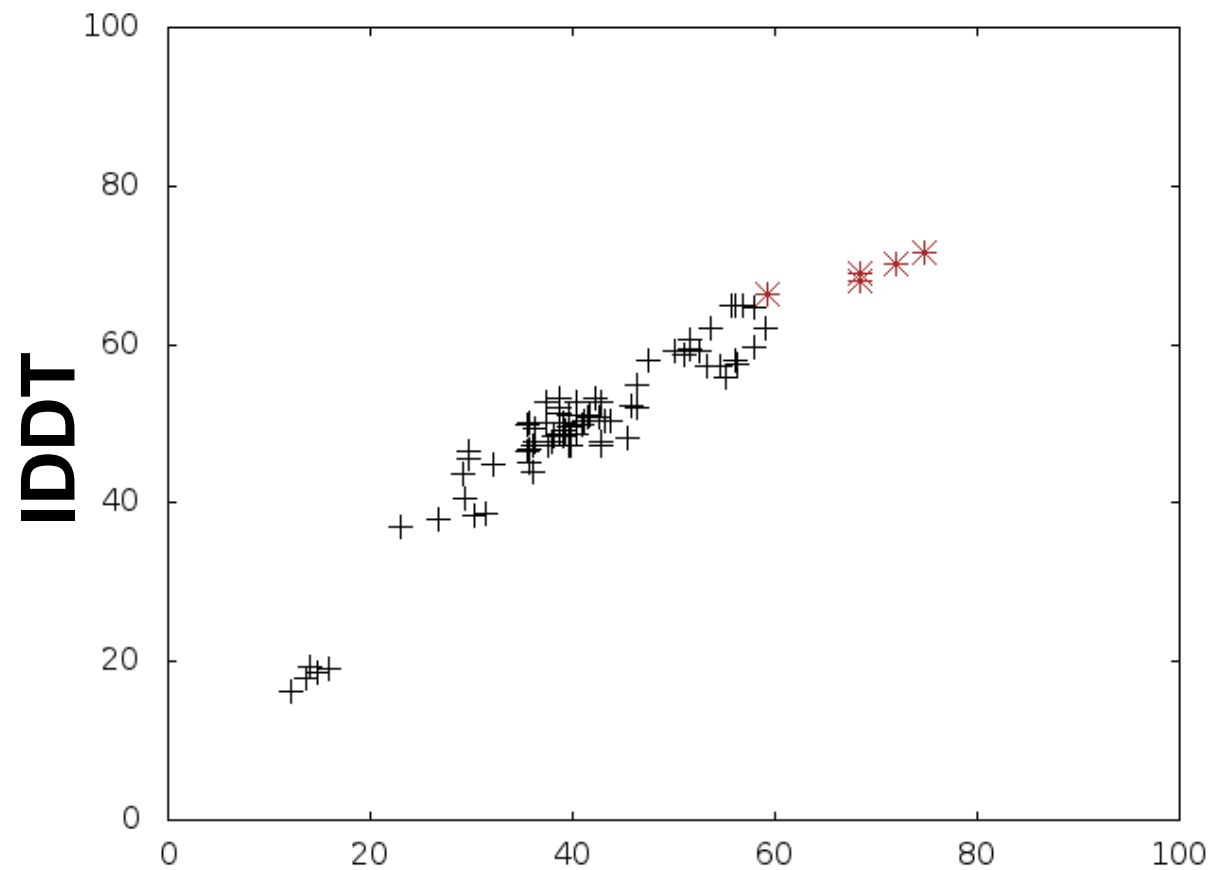
True ULR

Predicted ULR
F1 0.200

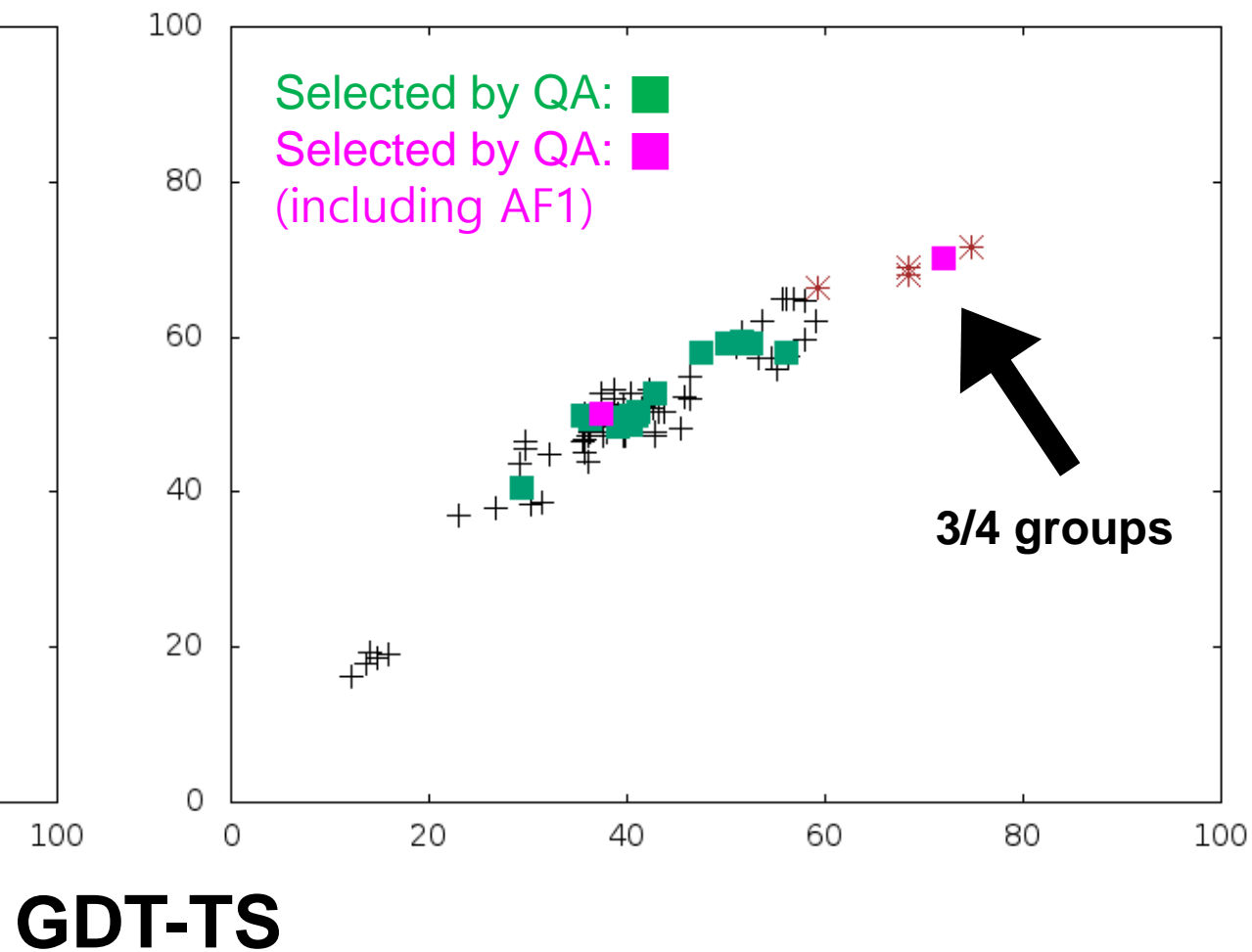


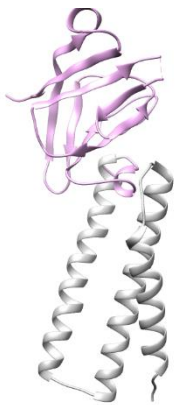
2. C1905-D1

Modeling results



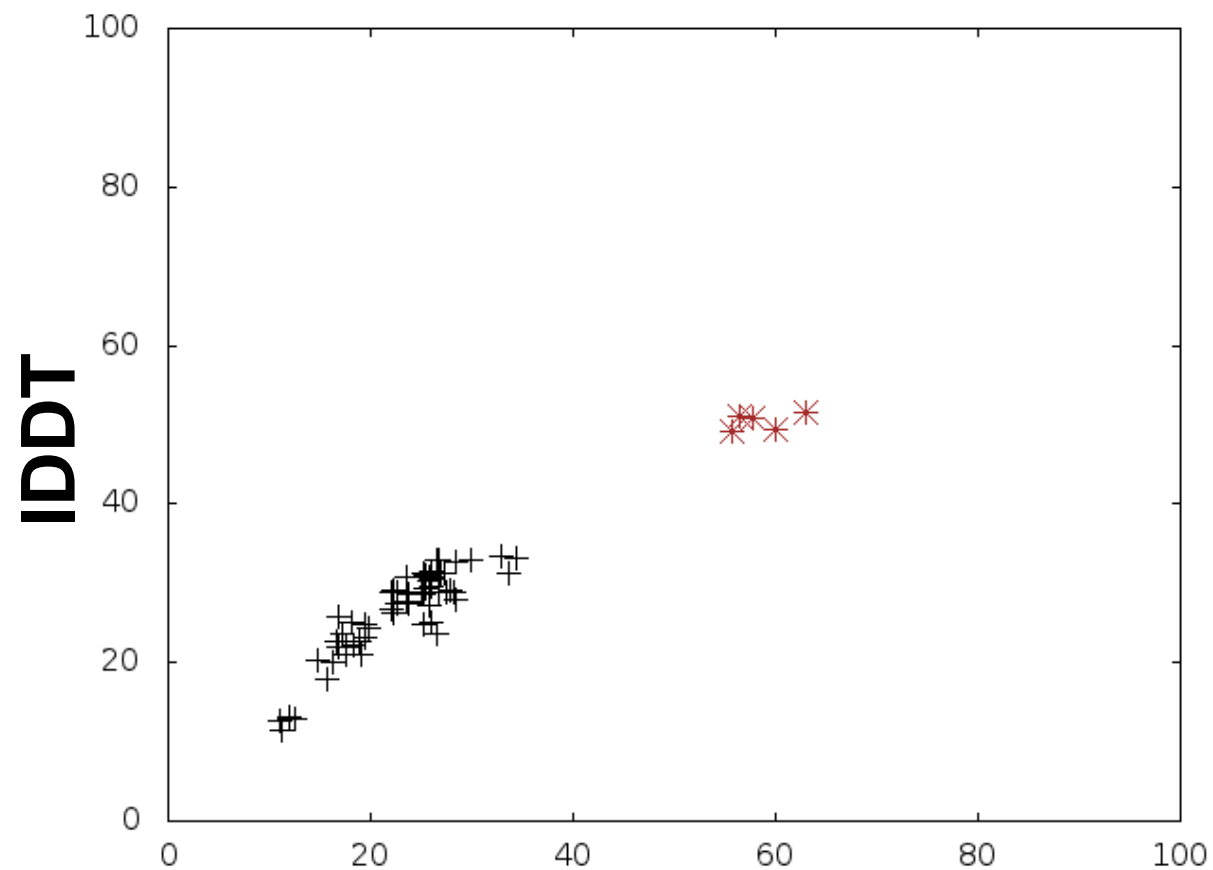
QA results



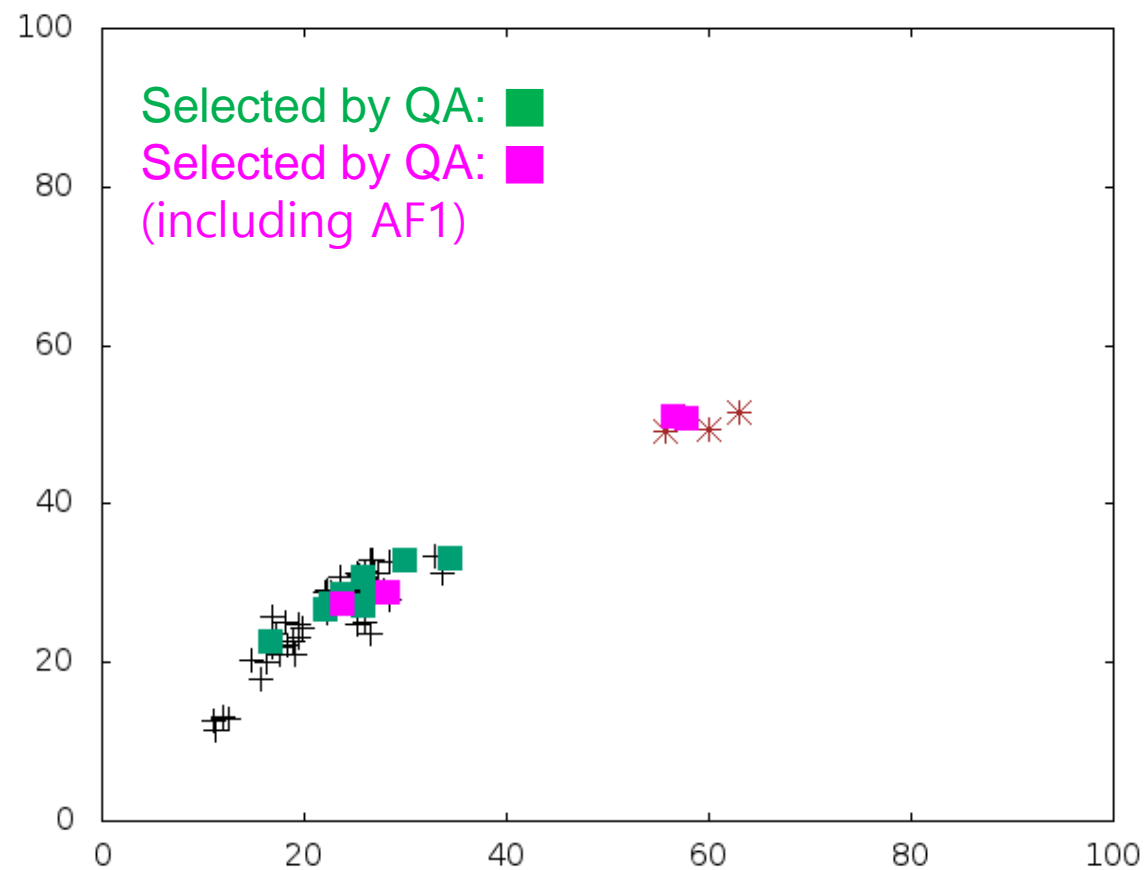


3. C1905-D2

Modeling results



QA results

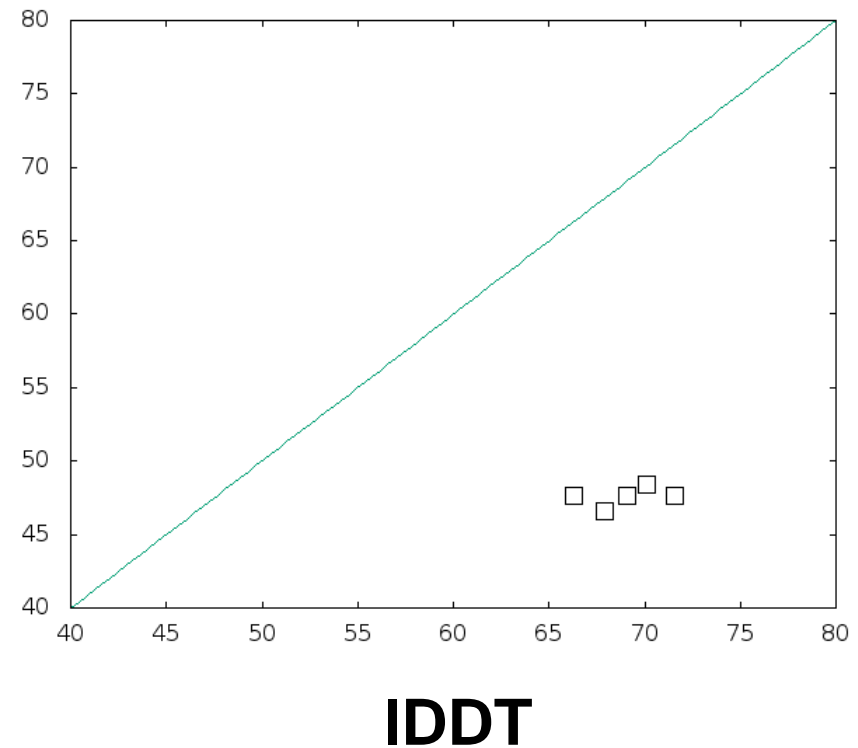
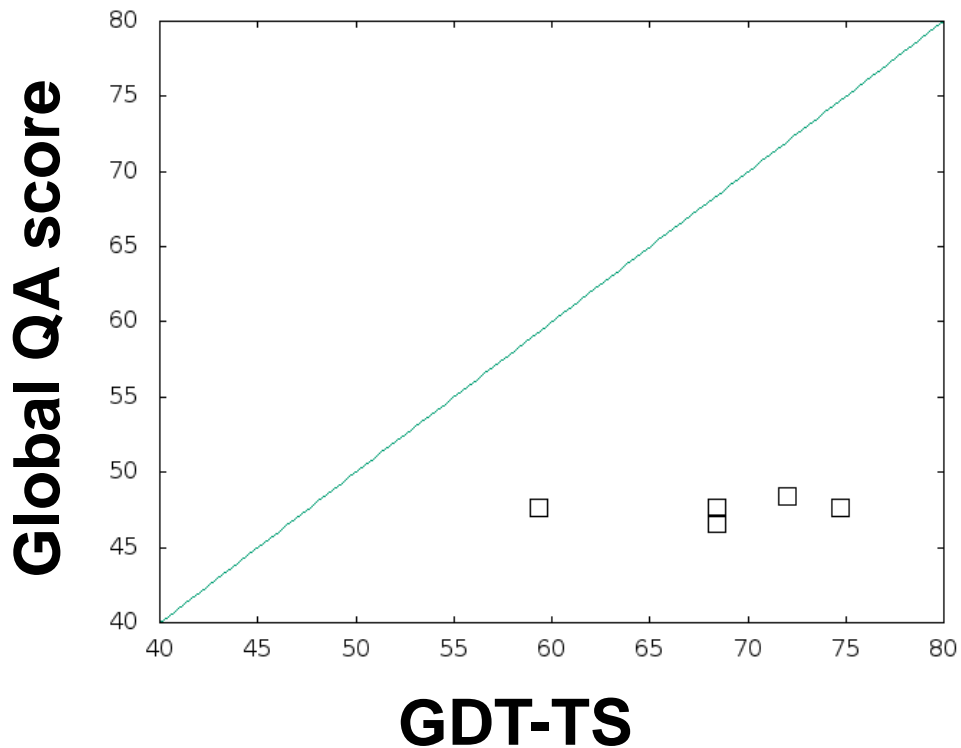


GDT-TS

EMA of AF1 models for by 10 QA groups

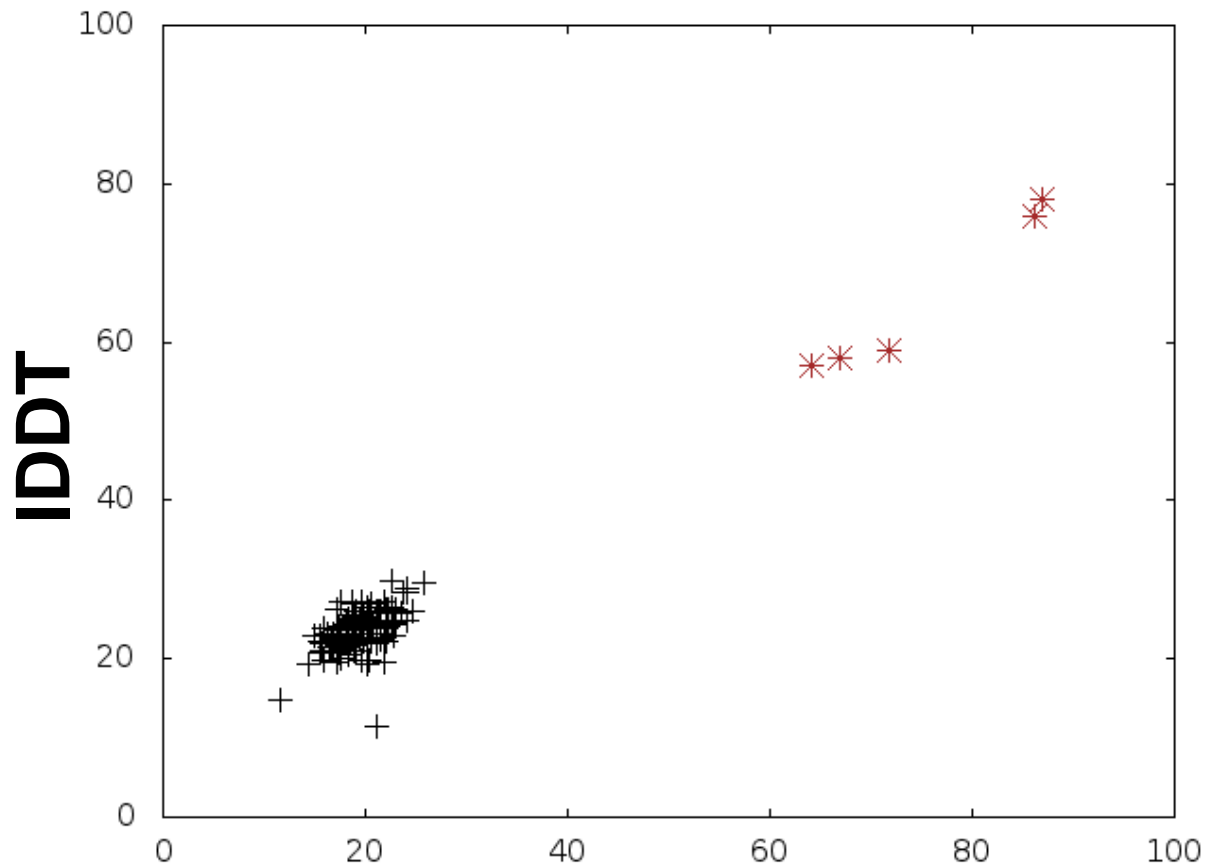
- For both C1905-D1 and C1905-D2, none of 10 groups selected the best models as top1.
- QA score and GDT-TS/IDDT show mostly negative correlations.

Best correlation: QMEANDisCo C1905-D1 AF1 models

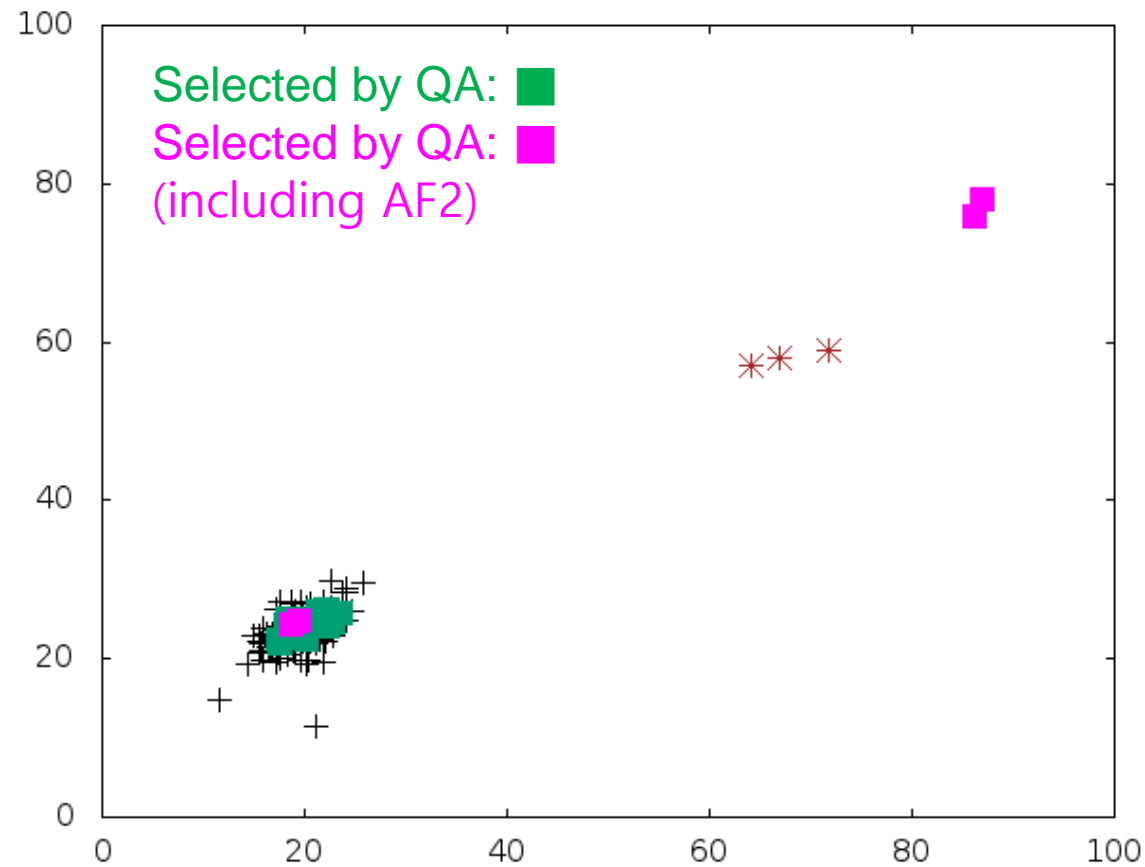


4. C1908 (T1064)

Modeling results

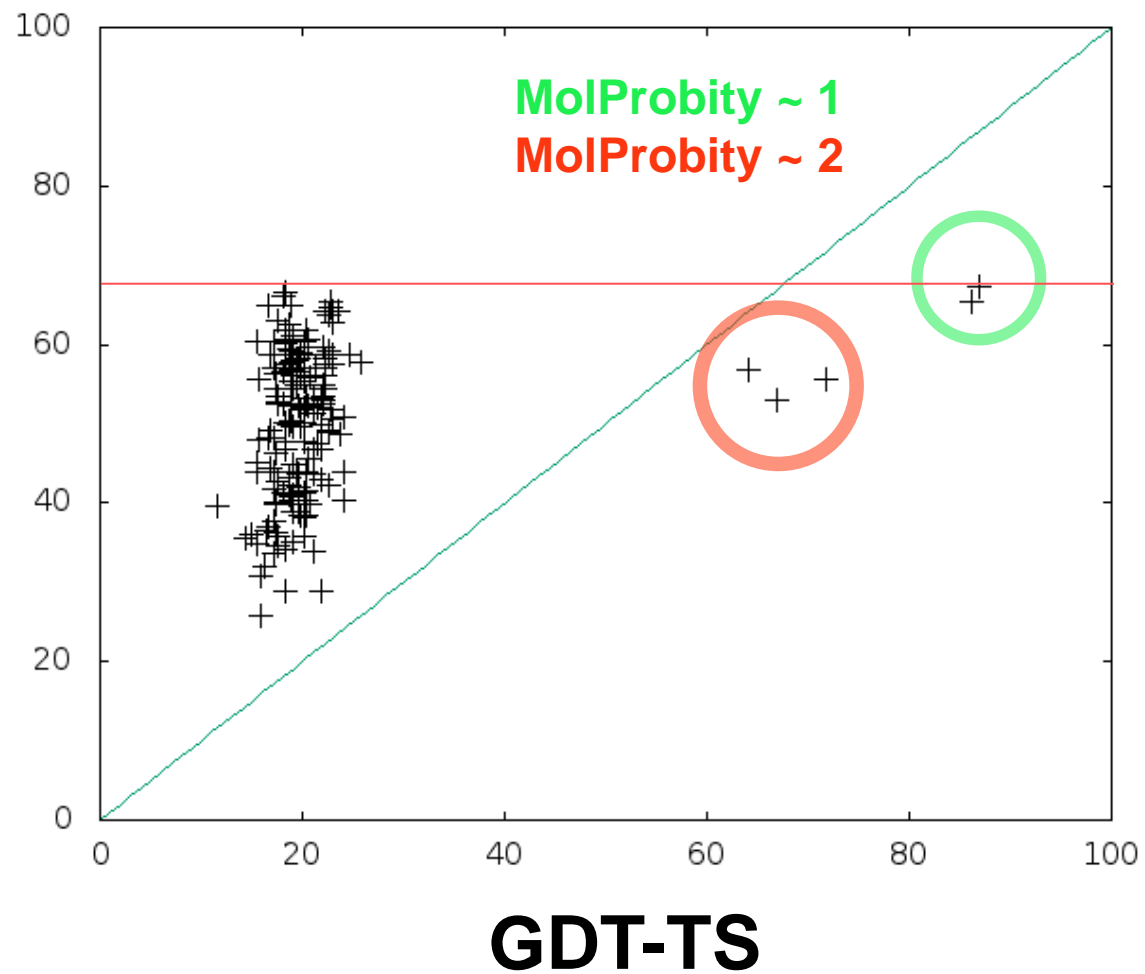
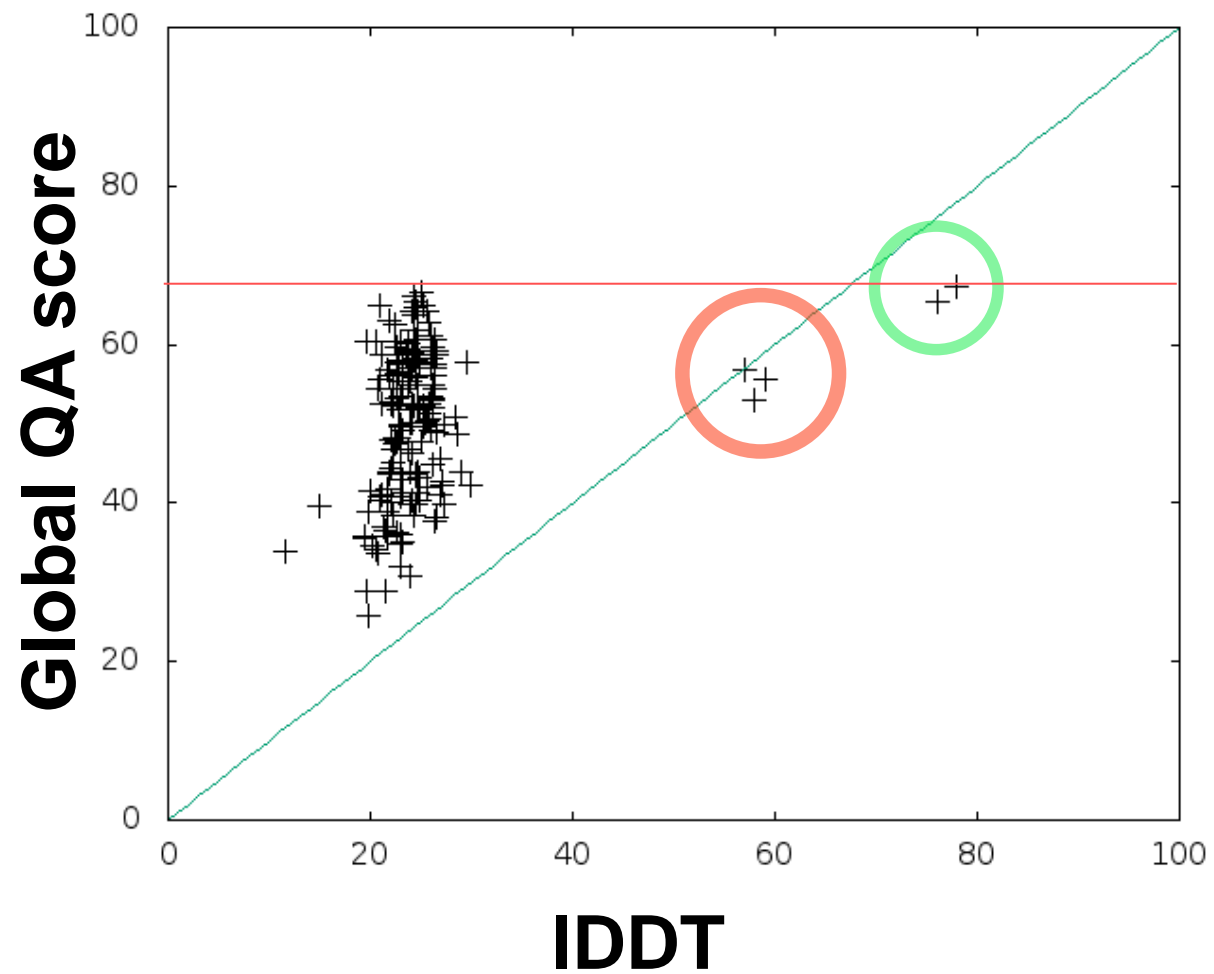


QA results



GDT-TS

VoroMQA-dark



C1908 structure in detail

AF2_1: GDT-TS = 87

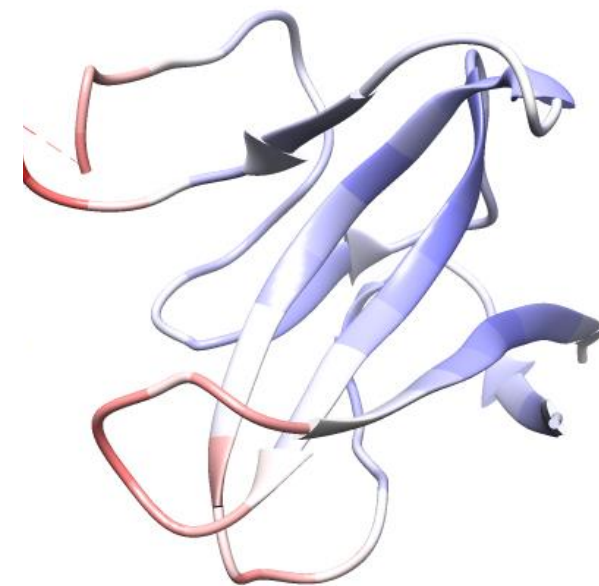
Crystal contact



Five models of AF2



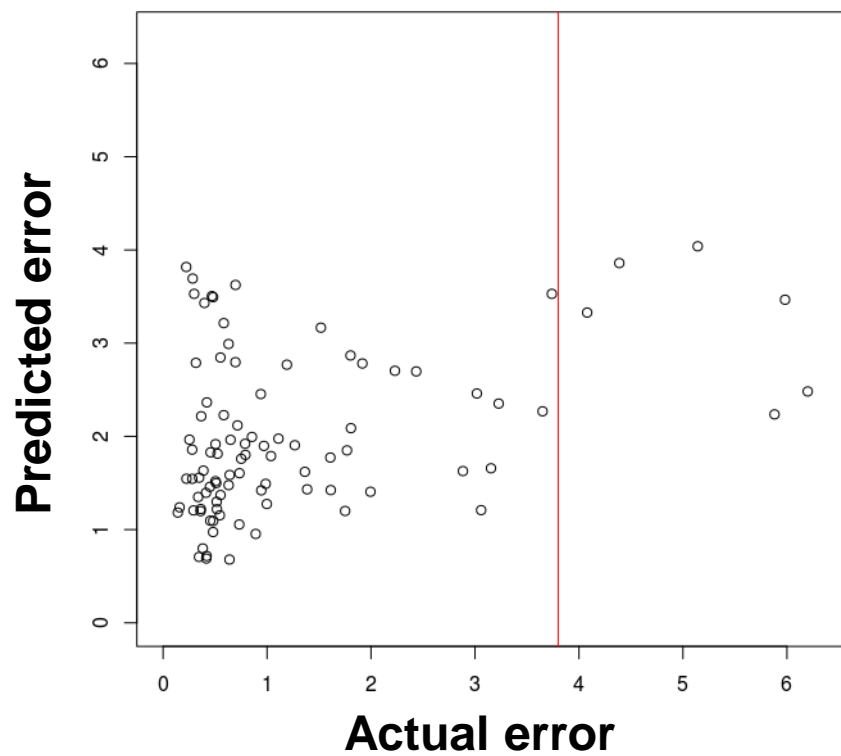
B-factor



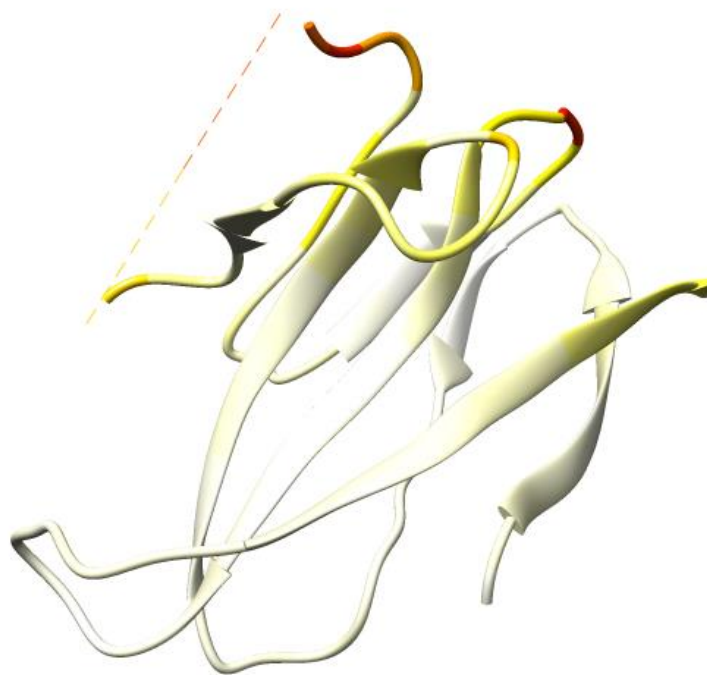
C1908: Local QA

Distance Error (Å)

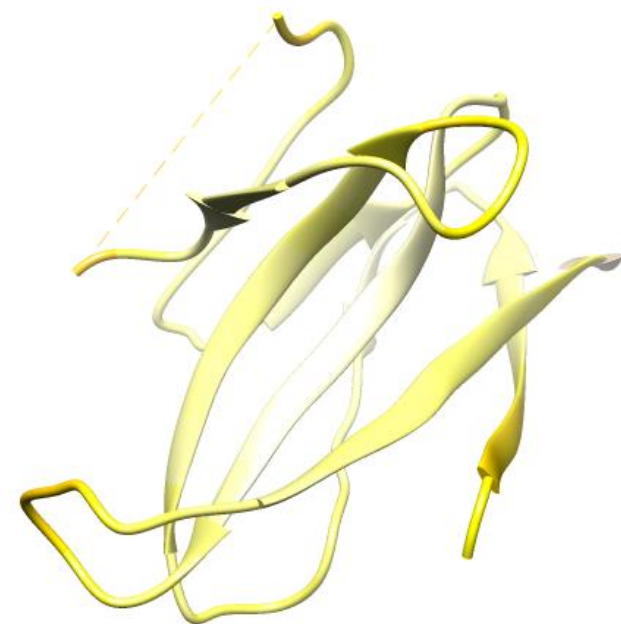
0 2 4 6



AUC 0.888



True distance error



Predicted distance error by PrQ3D

Conclusion

- Some QA methods can discriminate AF models from non-AF models.
- Current QA methods have difficulty in selecting models of high global structural accuracy involving domain orientation.
- Current QA methods are only partially successful in identifying inaccurately/accurately modelled regions.