Appendix Table: Derivative Order 0 (Function Values)

RMSE Comparison Across Methods and Noise Levels

1 Performance Table: Derivative Order 0

Method	**Noise = 0**	**Noise = 1e-6**	**Noise = 1e-3**
AAA_Julia	0.00	0.00	0.14
AAA_lowpres_Julia	$5.9e-14$	0.00	0.14
Butterworth_Python	0.81	0.81	0.85
Chebyshev_Python	0.12	0.12	0.16
FiniteDiff_Python	$0.0e+00$	0.00	0.13
GPR_Julia	0.00	0.00	0.02
GP_Matern_1.5_Python	$2.7e-11$	0.00	0.01
GP_Matern_2.5_Python	0.00	0.00	0.01
GP_Matern_Python	$2.7e-11$	0.00	0.01
GP_RBF_Iso_Python	0.00	0.00	0.01
GP_RBF_Python	0.00	0.00	0.01
JuliaAAAFullOpt_Julia	0.00	0.00	0.10
JuliaAAALS_Julia	0.00	0.00	0.06
JuliaAAASmoothBary_Julia	$1.6e-10$	0.00	0.11
JuliaAAATwoStage_Julia	0.00	0.00	0.06
KalmanGrad_Python	0.19	0.15	0.22
LOESS_Julia	0.09	0.09	0.14
SVR_Python	0.56	0.56	0.58
SavitzkyGolay_Python	0.05	0.05	0.09
TVDiff_Julia	$2.5e-14$	0.00	0.13

2 Notes

- RMSE values are shown for function approximation (derivative order 0)
- Green values indicate excellent performance (RMSE < 0.1)
- Values represent Root Mean Square Error across test cases
- GPR_Julia shows consistent performance across all noise levels