Complementary cumulative distributions **QNGOptimizer** AdamOptimizer approx='block-diag',  $\lambda$ =0.5  $\beta_1 = 0.9, \beta_2 = 0.99, \varepsilon = 10^{-8}$ 1.0  $-\eta = 0.01$ n = 0.45n = 0.01n = 0.2 $\eta = 0.025$  $\eta = 0.025$  $\eta = 0.225$  $\eta = 0.5$ Probability of occurrence 8.0  $\eta = 0.05$  $\eta = 0.25$  $\eta = 0.05$  $\eta = 0.55$  $\eta = 0.075$  $\eta = 0.275$  $\eta = 0.1$  $\eta = 0.6$  $\eta = 0.1$ n = 0.15 $\eta = 0.3$  $\eta = 0.65$  $\eta = 0.125$  $\eta = 0.2$  $\eta = 0.7$  $\eta = 0.4$ 0.6 n = 0.15 $\eta = 0.5$  $\eta = 0.25$  $\eta = 0.75$  $\eta = 0.175$  $\eta = 0.3$  $\eta = 0.8$ n = 0.6 $\eta = 0.35$  $\eta = 0.85$ 0.4  $\eta = 0.4$  $\eta = 0.9$ 0.2 (b) (a) 0.0 MomentumQNGOptimizer MomentumOptimizer  $\rho$ =0.9, approx='block-diag',  $\lambda$ =0.5  $\rho = 0.9$ 1.0  $\eta = 0.01$  $\eta = 0.25$  $\eta = 0.001$  $\eta = 0.012$ n = 0.025 $\eta = 0.275$  $\eta = 0.002$  $-\eta = 0.013$ Probability of occurrence  $\eta = 0.05$  $\eta = 0.3$  $\eta = 0.003$ ---  $\eta$ =0.014 0.8  $\eta = 0.075$  $\eta = 0.325$  $\eta = 0.004$  $\eta = 0.015$  $\eta = 0.1$  $\eta = 0.35$  $\eta = 0.005$  $\eta = 0.016$  $\eta = 0.125$  $\eta = 0.375$  $\eta = 0.006$  $\eta = 0.017$ 0.6  $\eta = 0.15$  $\eta = 0.4$  $\eta = 0.007$ ---  $\eta = 0.018$  $\eta = 0.175$  $\eta = 0.425$  $\eta = 0.008$ n=0.019 $\eta = 0.2$  $\eta = 0.45$ n = 0.009 $\eta = 0.02$ 0.4  $\eta = 0.225$  $\eta = 0.01$  $\eta = 0.021$ n = 0.0110.2 (d) (c) 0.0 50 150 200 0 50 100 100 150 200 steps steps