



Figure S6. Comparison of estimators at low spike counts. Data were generated using a model with Von Mises tuning curves and independent Poisson variability, with $N=50$ neurons, and population-averaged spike count per trial matched to main Figure 7a,b. **(a)** Estimate of the Fisher information obtained by decoding (red) or direct estimation with bias correction (blue). The continuous lines represent the mean, the shaded area represents ± 1 std across experiments, computed by bootstrap. **(b)** MSE of the decoder-based estimate (red) and the direct estimator (blue).