Supplementary material: 'On the interaction of stochastic forcing and regime dynamics'

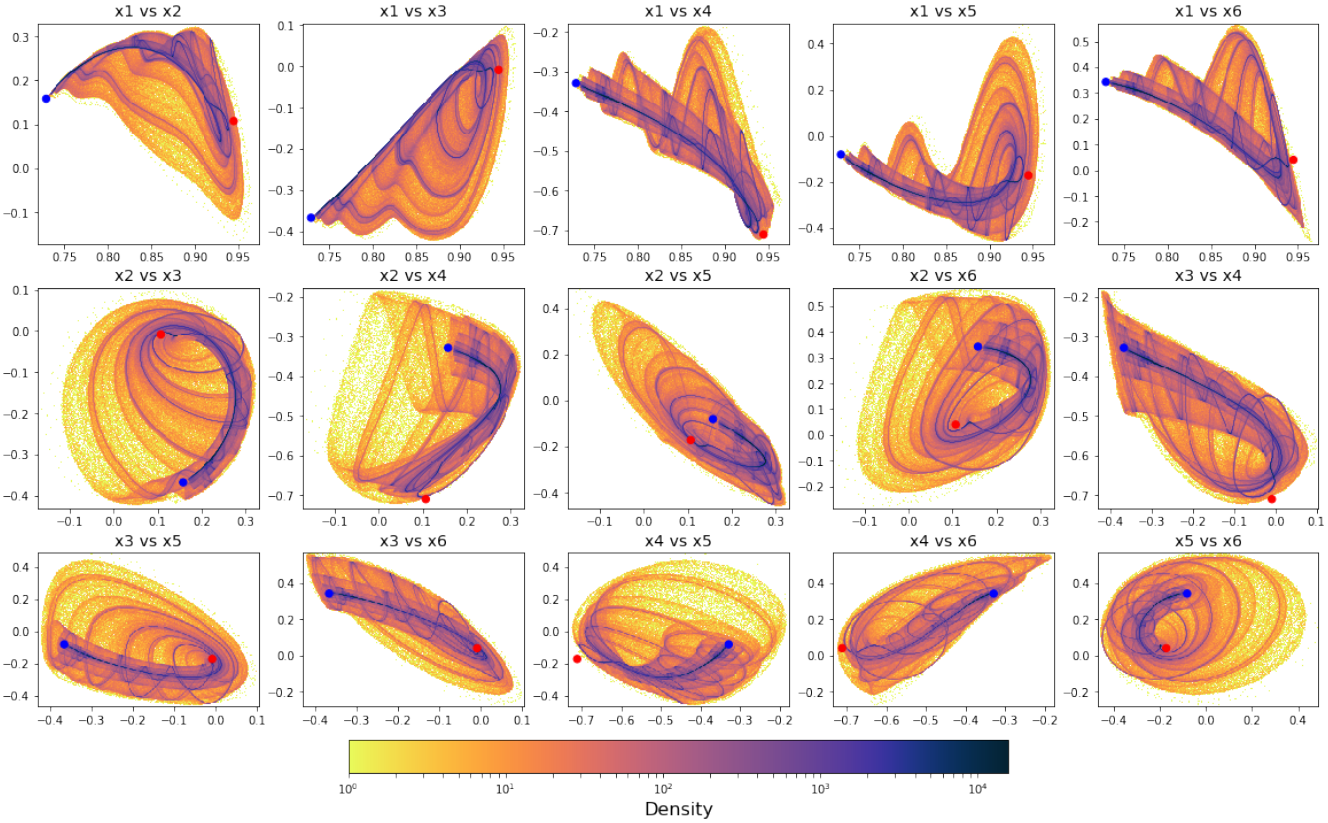

Figure S1. Two dimensional histograms of the deterministic CdV79 system, projected onto the various combinations of modes.Deterministic fixed points are shown, for the blocking fixed point in blue, and the zonal fixed point in red.

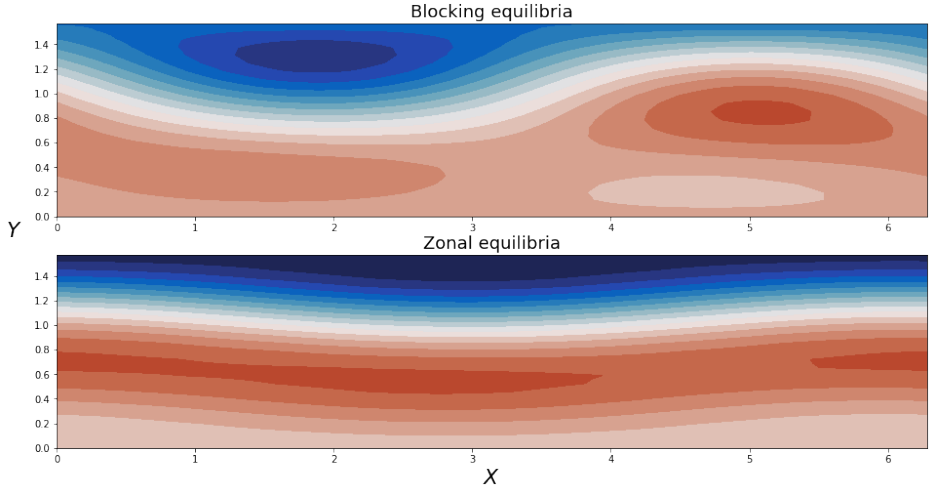

Figure S2. Streamfunction fields corresponding to the unstable blocking and zonal equilibria discussed in the main text.

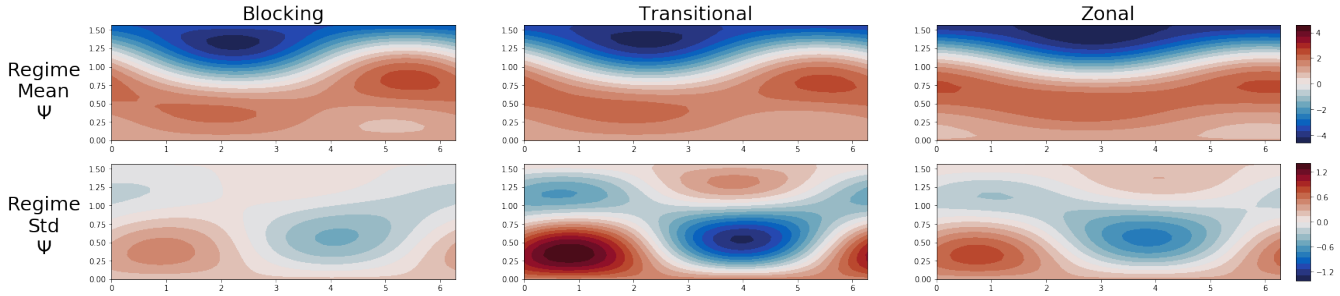

Figure S3. Top: Average streamfunction field $\Psi(t,x,y) = \sum_{i=1}^{6} x_i(t)\Phi_i(x,y)$ for points on the deterministic attractor assigned to each of the three regimes by the hidden Markov model. Bottom: The standard deviation of the streamfunction field within each regime, showing the intra-regime variability.

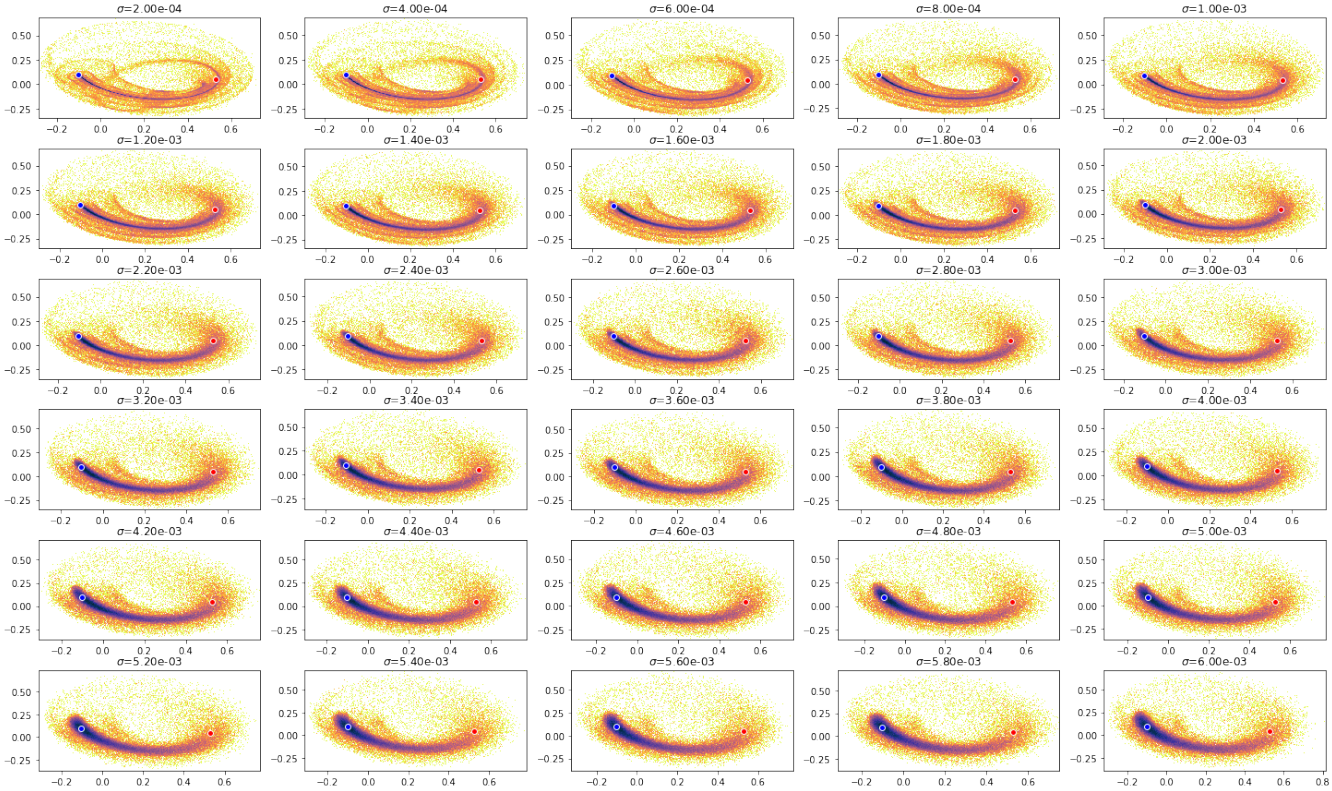

Figure S4. A histogram of the CdV79 model attractor, projected onto the 2 leading EOFs of the deterministic system, for an increasing strength of the stochastic forcing. Deterministic fixed points are shown, for the blocking fixed point in blue, and the zonal fixed point in red.

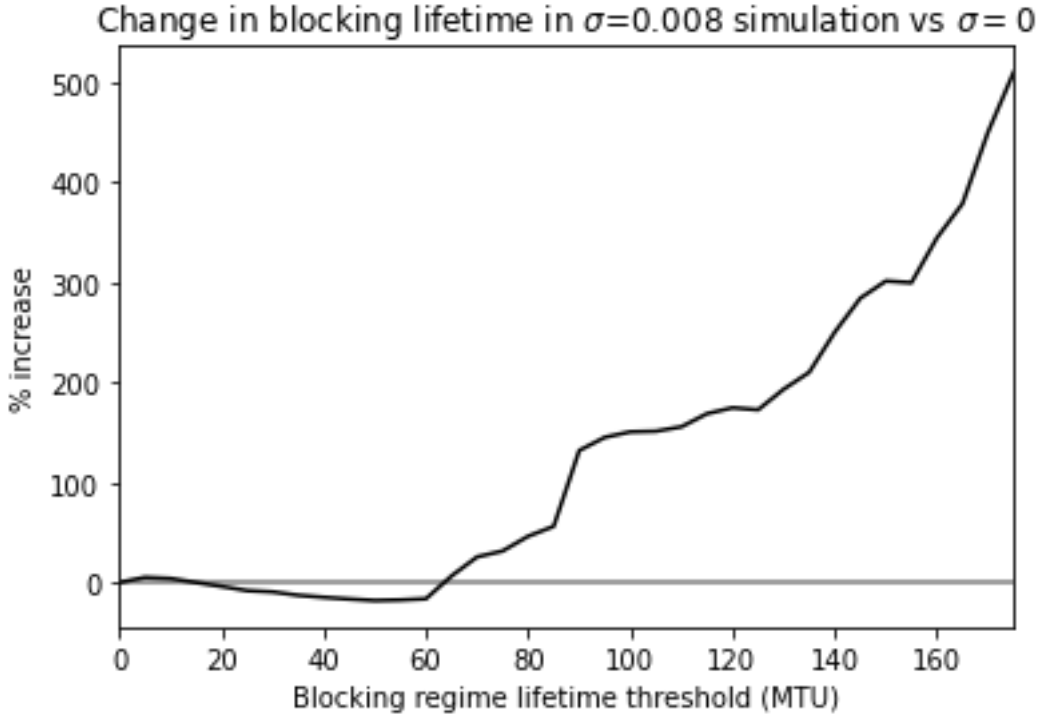

Figure S5. The percentage increase in the number of blocking regime events lasting for a certain minimum duration in the stochastic CdV system with $\sigma = 0.008$, when blocking persistence is maximum, in comparison to the deterministic system. We see that extremely persistent events are the most impacted by stochasticity.