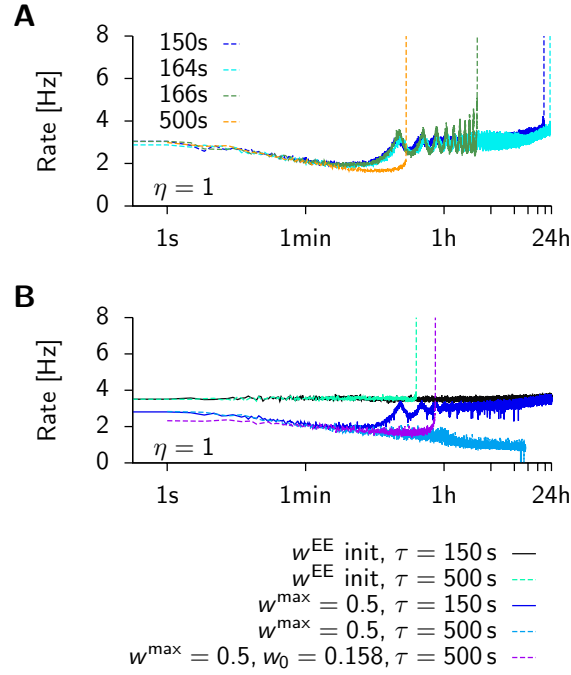


Figure S1



Evolution of the population rate for metaplastic triplet STDP model. (A) Temporal evolution of mean population rate for different values of τ ($\eta = 1$). While the change in stability in the vicinity of $\tau^{\text{crit}} = 166 \text{ s}$ can be understood from the mean field theory, which also predicts the observed oscillations at criticality, the late destabilization of the curve $\tau = 150 \text{ s}$ is not captured by the theory. (B) Evolution of mean population rate for $\eta = 1$. Black: $\tau = 150 \text{ s}$ and weights are initialized with the weights from a stable run ($\eta = 6.25$, $\tau = 10 \text{ s}$) at $t = 24 \text{ h}$. Cyan: Same, but with $\tau = 500 \text{ s}$. Dark blue: $\tau = 150 \text{ s}$, weight initialization as in (A), but maximally allowed weights limited to $w^{\max} = 0.5$. Light blue: $\tau = 500 \text{ s}$, network falls silent at $t \approx 10 \text{ h}$. Purple: $\tau = 500 \text{ s}$, with $w_0 = 0.158$ (the learning rate was unchanged), which reduces the initial excursion to low rates.