



Figure S1: Power (0.05 FPR) of the cross-population SVM test compared to other cross-population tests of neutrality. Shown across selection pressures $s \in [0.01, 0.08]$ and times $\tau \in [0, 4000]$. The (black) line labelled ‘XP-SFselect- s ’ shows power when assuming knowledge of the selection coefficient and the time (τ and s , respectively). The (blue) line labeled ‘XP-SFselect’ shows power when no prior knowledge of (s, τ) is assumed. Time is shown in generations (bottom axes), and $\ln(2Ns)/s$ generations (top axes). The dashed vertical lines (grey) show the mean time to fixation of the beneficial allele, which occurs at $\approx 5 \ln(2Ns)/s$ generations.