

Perturbed GUE

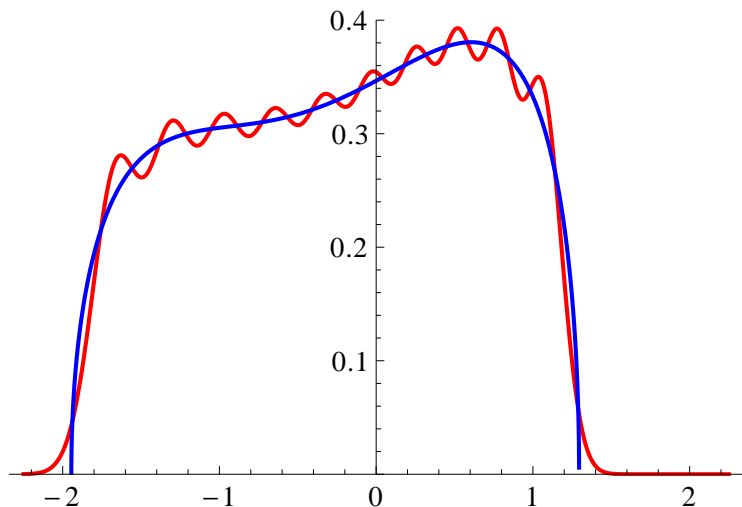
Now consider a perturbed GUE measure:

$$dP_n(M) = \frac{1}{Z_n(t)} \exp(-n \operatorname{tr} V(M)) dM$$

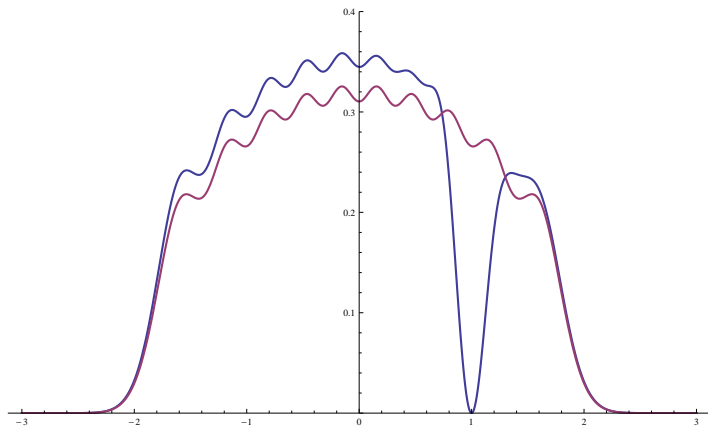
$$V(M) = \frac{1}{2} M^2 + \sum_{j=1}^{2\nu} t_j M^j$$

What happens to the mean density of eigenvalues?

10th mean density and eq. meas., $V(\lambda) = \frac{1}{2}\lambda^2 + \frac{1}{5}\lambda^3 + \frac{1}{10}\lambda^4$



Level repulsion: GUE(10) conditioned on e'val. at $\lambda = 1$

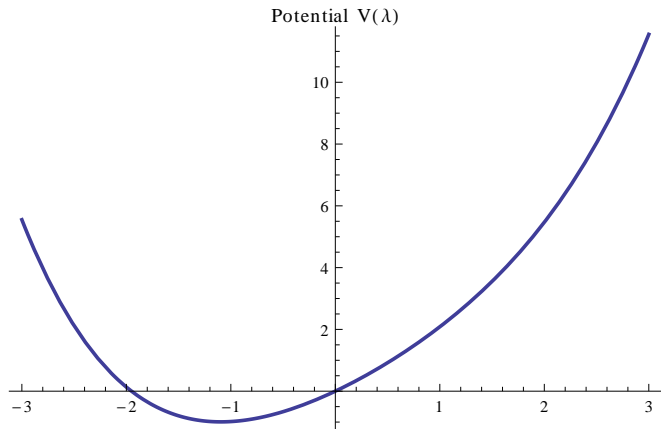


Minimization principle

The equilibrium measure will minimize the following energy functional

$$E(\psi) = \int \int \log (|\lambda - \eta|) \psi(\lambda)\psi(\eta) d\lambda d\eta + \int V(\lambda)\psi(\lambda) d\lambda$$

Example potential $V(\lambda) = \frac{8}{5}\lambda + \frac{1}{2}\lambda^2 - \frac{1}{15}\lambda^3 + \frac{1}{20}\lambda^4$



Effective potential and equilibrium measure

