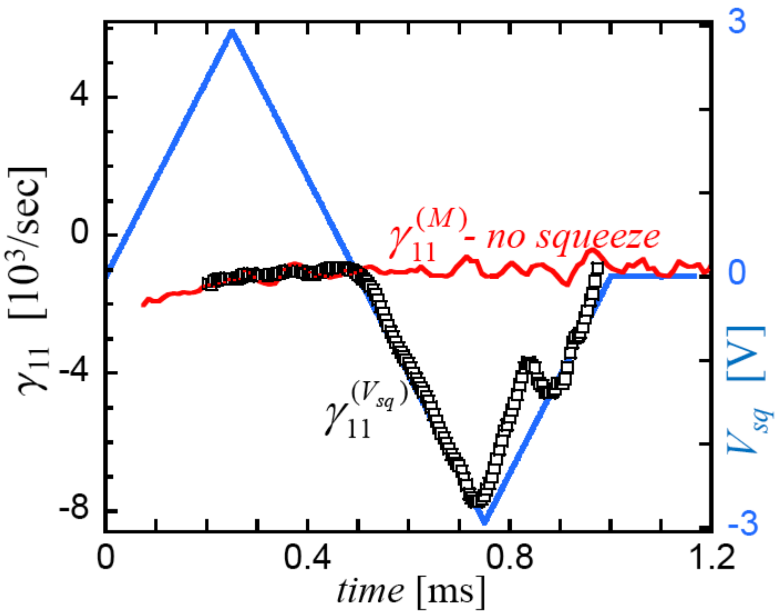
Wave damping from separatrix dissipation



We observe strong plasma wave damping due to both magnetic and electric separatrices.

At left, a *very* weak magnetic ripple, $\delta B_z/B_z \sim 10^{-3}$, causes damping of a k_z=1, m_θ=1 plasma wave at rate $\gamma_{11}^{(M)}$ (red), greatly exceeding Landau damping.

Adding a positive anti-squeeze does nothing (blue)
Adding a negative squeeze (blue) makes a separatrix, causing proportional increase in damping (black).

Wave damping can be further increased by chaotic dissipation on separatrix *ruffles*.

At right, the "Trapped Particle Diocotron Mode" damping rate γ_{1a} is increased
(a) by a static applied ruffle ΔV_m ; or
(b) by a wave-induced ruffle, from wave amplitude Q.

Damping experiments spanning 0.4 < B < 20.kG show the same scalings as transport:
Chaotic $\propto B^{-1}$ Collisional $\propto B^{-1/2}$