$k_{\parallel}\rho_p = 0.001 \quad \beta_{\parallel,p} = 1.0000 \quad \frac{T_{\parallel,p}}{T_{\parallel,e}} = 1.000$ $k_{\perp}\rho_{p} = 0.001 \quad \frac{T_{\perp}}{T_{\parallel}}|_{p} = 1.000 \quad \frac{T_{\perp,e}}{T_{\parallel,e}} = 1.000$ 0.5 $\gamma_{\rm r}/\Omega_p \times 10^{3.0}$ $-0.5 \\ -1$

PLUME Dispersion Relation