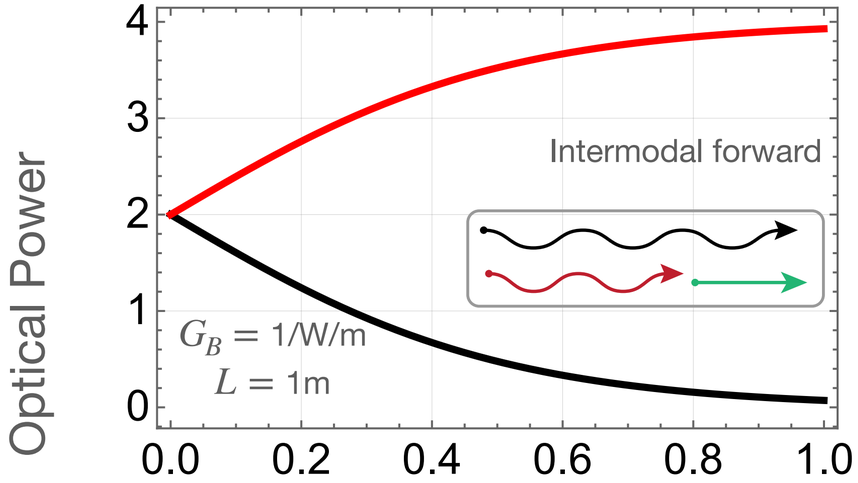
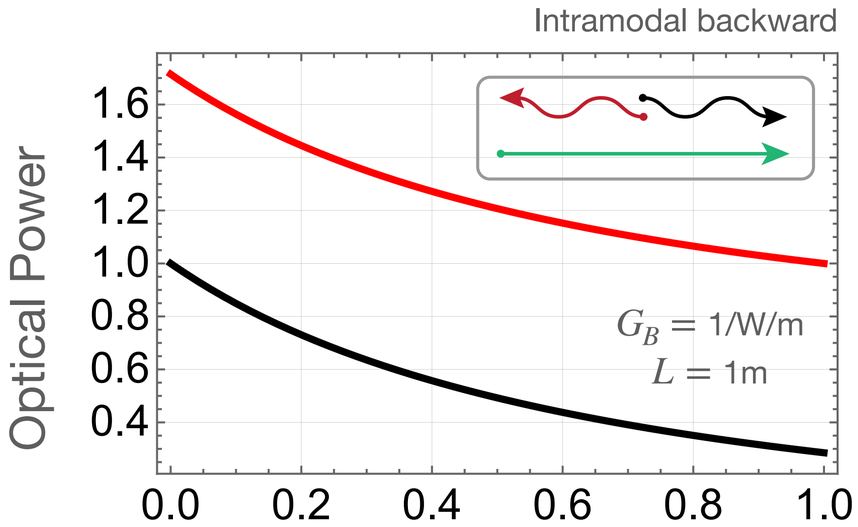
The full Brillouin gain calculation

- Steady state: $\partial_t = 0$
- Lossy mechanical wave (large γ_m/ν_m)

$$\partial_z P_p = -G_B P_p P_s - \alpha_p P_p$$
$$\partial_z P_s = \pm G_B P_p P_s \mp \alpha_s P_s$$





1. Wiederhecker, G. S., Dainese, P. & Alegre, T. P. M. Brillouin optomechanics in nanophotonic structures. APL Photonics 4, (2019).

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Lorentzian lineshape

$$G_B(\Omega) = Q_m \frac{2\omega_p \mathscr{L}(\Omega)}{\bar{m}_{\text{eff}} \Omega_m^2} \left| \int f_{\text{mb}}^{\text{wg}} dl + \int f_{\text{pe}}^{\text{wg}} dA \right|^2$$

Effective mass — Overlap (MB) — Overlap (PE)

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