



The full Brillouin gain calculation

$$\begin{aligned} \left(v_p \partial_z + \partial_t + v_p \alpha_p / 2 \right) \tilde{a}_p &= -i \tilde{g}_0 \tilde{a}_s \tilde{b} \\ \left(\pm v_s \partial_z + \partial_t + v_s \alpha_s / 2 \right) \tilde{a}_s &= -i \tilde{g}_0^* \tilde{b}^* \tilde{a}_p \\ \left[v_m \partial_z + \partial_t + (i \Delta_m + \gamma_m / 2) \right] \tilde{b} &= -i \tilde{g}_0^* \tilde{a}_s^* \tilde{a}_p, \end{aligned}$$

1. Tomes, M., Marquardt, F., Bahl, G. & Carmon, T. Phys. Rev. A 84, 063806 (2011).
2. Wolff, C., Steel, M. J., Eggleton, B. J. & Poulton, C. G. Phys. Rev. A 92, 13836 (2015).
3. Van Laer, R., Baets, R. & Van Thourhout, D. Phys. Rev. A 93, 1–15 (2016).
4. Sipe, J. E. & Steel, M. J. New J. Phys. 18, 1–39 (2016).
5. Kharel, P., Behunin, R. O., Renninger, W. H. & Rakich, P. T. Phys. Rev. A 93, 1–12 (2016).
6. Wolff, C., Smith, M., Stiller, B., & Poulton, C. (2021). JOSAB, 38 (4), 1243-1269.



The full Brillouin gain calculation

$$\left(v_p \partial_z + \partial_t + v_p \alpha_p / 2 \right) \tilde{a}_p = -i \tilde{g}_0 \tilde{a}_s \tilde{b}$$

$$\left(\pm v_s \partial_z + \partial_t + v_s \alpha_s / 2 \right) \tilde{a}_s = -i \tilde{g}_0^* \tilde{b}^* \tilde{a}_p$$

$$\left[v_m \partial_z + \partial_t + \left(i \Delta_m + \gamma_m / 2 \right) \right] \tilde{b} = -i \tilde{g}_0^* \tilde{a}_s^* \tilde{a}_p,$$

Propagation

Detuning

Loss

1. Tomes, M., Marquardt, F., Bahl, G. & Carmon, T. Phys. Rev. A 84, 063806 (2011).
2. Wolff, C., Steel, M. J., Eggleton, B. J. & Poulton, C. G. Phys. Rev. A 92, 13836 (2015).
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5. Kharel, P., Behunin, R. O., Renninger, W. H. & Rakich, P. T. Phys. Rev. A 93, 1–12 (2016).
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