Normal modes and propagation dynamics in a strongly driven Raman medium

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Abstract: We study the collinear propagation of two weak sideband fields in a far-off-resonance Raman medium driven by a strong field. We show the existence of two sideband-field superpositions called normal modes that propagate independently at different group velocities, one at the vacuum speed of light and one at a reduced velocity and with an induced relative phase shift. We find that the effect of slow group velocity on nonlinear conversion occurs via the relative group delay as well as the relative phase shift. ??2001 The American Physical Society.

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