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Modulation instability in nonlinear metamaterials induced by cubic-quintic nonlinearities and higher order dispersive effects

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We have investigated modulation instability in metamaterials (MM) with both cubic and quintic nonlinearities, based on a model appropriate for pulse propagation in MMs with cubic-quintic nonlinearities and higher order dispersive effects. We have included loss into account in our analysis and found that loss distorts the sidebands of the MI gain spectrum. We find that the combined effect of cubic-quintic nonlinearity increases the MI gain. The role of higher order nonlinear dispersive effects on MI has been also discussed.

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