Spin wave pulsed propagation in a magnonic crystal

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Magnonic crystals (MCs) have recently demonstrated an outstanding capability to connect fundamental physics with applications at microwave frequencies. Their characteristics have inspired multiple studies where detailed results on the behavior of the frequency-amplitude characteristic as a function of different structural parameters have been demonstrated. However, up to now, all the scientific reports deal exclusively with the resulting spin wave spectrum of the complete MC structure and little has been said about the behavior of the spin wave inside the magnonic crystal. Here, we present a detailed study of the propagation of surface spin waves pulses in a MC, the influence of the duration of the pulse in the formation and evolution of frequency bandgaps, and the spatial energy distribution as a function of frequency and position.

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