

Abstract Submitted  
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**Bulk and surface magnetoinductive breathers in binary metamaterials** GEORGE TSIRONIS, University of Crete and FORTH, NIKOS LAZARIDES, University of Crete, MARIO MOLINA, University of Chile — We study theoretically the existence of bulk and surface discrete breathers in a one-dimensional magnetic metamaterial comprised of a periodic binary array of splitting resonators [1,2]. The two types of resonators differ in slit sizes leading to different SRR resonant frequencies. We construct several types of breather excitations for both the energy-conserved and the dissipative-driven systems using both the rotating wave approximation as well as the method of continuation from the anticontinuous limit to finite couplings. We demonstrate that discrete breathers can appear spontaneously in the dissipative-driven system as a result of a fundamental instability. We connect the appearance of breathers to the properties of wave propagation in the finite medium.

[1] M. Molina, et al. Phys. Rev. E, **80** , 046605 (2009)

[2] M. Eleftheriou et al., Phys. Rev. E **80**, 017601 (2009)

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