

# Fano resonances in magnetic metamaterials

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We study the scattering of magnetoinductive plane waves by internal (external) capacitive (inductive) defects coupled to a one-dimensional split-ring resonator array. We examine a number of simple defect configurations where Fano resonances occur and study the behavior of the transmission coefficient as a function of the controllable external parameters. We find that for embedded capacitive defects, the addition of a small amount of coupling to second neighbors is necessary for the occurrence of Fano resonance. For external inductive defects, Fano resonances are commonplace, and they can be tuned by changing the relative orientation or distance between the defect and the SSR array. © 2011 American Physical Society.