Fano resonances in waveguide arrays with saturable nonlinearity

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We study a waveguide array with an embedded nonlinear saturable impurity. We solve the impurity problem in closed form and find the nonlinear localized modes. Next, we consider the scattering of a small-amplitude plane wave by a nonlinear impurity mode, and discover regions in parameter space where transmission is fully suppressed. We relate these findings with Fano resonances and propose this setup as a means to control the transport of light across the array.