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Nonlinear Scattering of BECs on a Finite Barrier¹ RACHEL R. MILLER, MATTHEW S. HELLER, LINCOLN D. CARR, Colorado School of Mines — We consider the scattering of a Bose-Einstein condensate (BEC) on a finite barrier. The nonlinear Schrödinger equation (NLS) models the mean field of a BEC. Analytic stationary state solutions to the NLS can be found for the case of piecewise constant potential. We present these solutions in closed analytic form, as well as density and transmission plots for several physical cases. This study is directly applicable to an atom laser, as well as many other physical systems described by the NLS.

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