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Transverse instabilities of dark solitons for the (2+1)-dimensional defocusing nonlinear Schrödinger / Gross-Pitaevskii equation are considered. Asymptotics and computations of the eigenvalues of the linearized equation yield the maximum growth rate of unstable perturbations. The separatrix between convective and absolute instabilities is found and used for studying the transition between convective and absolute instabilities of stationary and non-stationary oblique dispersive shock waves in the shallow and hypersonic regimes. These results have application to controlling nonlinear waves in dispersive media, such as dispersive shocks in Bose-Einstein condensates and nonlinear optics. (Received November 22, 2011)