

MODULATIONAL INSTABILITY OF SOME NONLINEAR  
CONTINUUM AND DISCRETE MODELS

*Anca Visinescu, Dan Grecu*

*Department of Theoretical Physics*

*National Institute of Physics and Nuclear Engineering, Bucharest, Romania*

Abstract

Modulational instability (also known as the Benjamin-Feir instability) of quasi-monochromatic waves propagating in dispersive and weakly nonlinear media is a general phenomenon encountered in hydrodynamics, plasma physics, condensed matter and is responsible for the generation of robust solitary waves (sometime solitons). The statistical approach is reviewed for several nonlinear systems: the nonlinear Schrödinger equation, the discrete self-trapping equation and the Manakov system. An integral stability equation is deduced from a linearized kinetic equation for the two-point correlation function. This is solved for several choices of the unperturbed initial spectral function.