Signal-noise interaction in nonlinear optical fibers: a fluid-dynamic approach

L. Barletti
Dipartimento di Matematica, Università di Firenze (Italia)
barletti@math.unifi.it

We consider the one-dimensional NLSE for opical fibers under noisy input conditions. Assuming small dispersion, we (formally) approximate the NLSE with a "semiclassical" fluid-dynamic system of Madelung type. Then, assuming high signal-to-noise ratio, a perturbative procedure is applied to the Madelung system in order to study the propagation of a deterministic signal affected by a band-limited white noise.