Instabilité modulationelle d'une onde plane en présence de perturbations bruyantes et localisées : Experiences dans les fibres optiques.

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Hydrodynamique (1967)

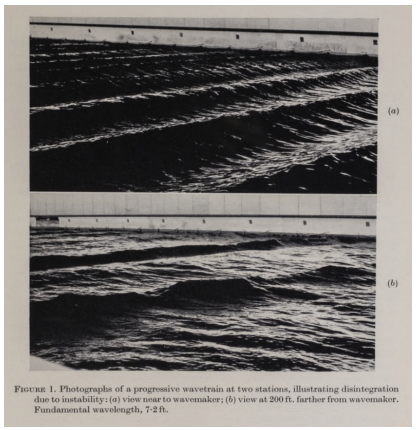
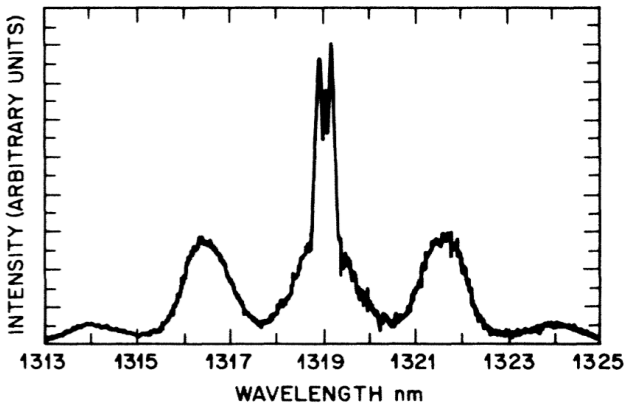


FIGURE 1. Photographs of a progressive wavetrain at two stations, illustrating disintegration due to instability: (a) view near to wavemaker; (b) view at 200 ft. farther from wavemaker. Fundamental wavelength, 7·2 ft.

Benjamin, T. Brooke, and J. E. Feir. "The disintegration of wave trains on deep water Part 1. Theory." Journal of Fluid Mechanics 27.3 (1967): 417-430.

Optique (1985)

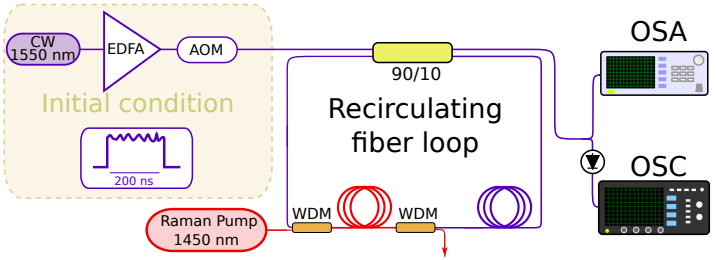


Tai, K., Hasegawa, A., & Tomita, A. (1986). Observation of modulational instability in optical fibers. Physical review letters, 56(2), 135.

Problématique:

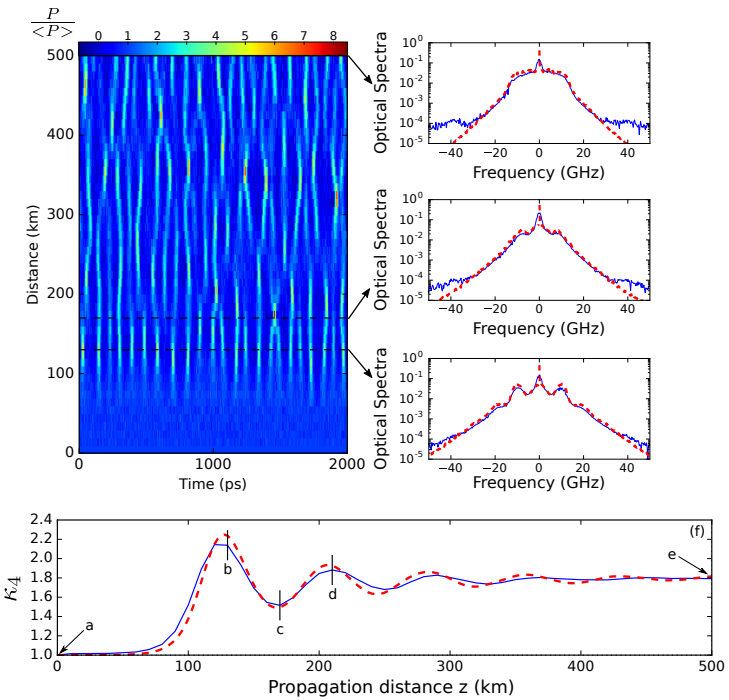
Observer expérimentalement le stade non linéaire d'une perturbation localisée et aléatoire en optique.

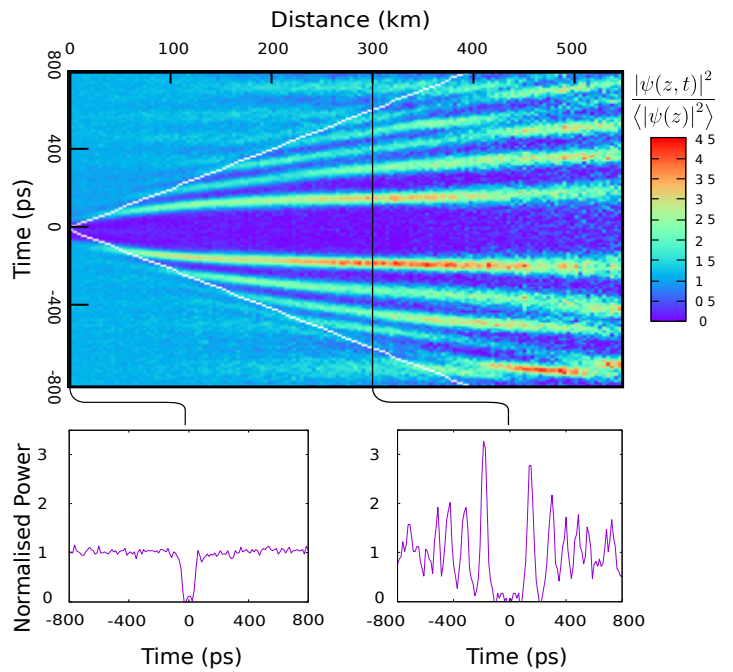
Résultats



Schrödinger non linéaire en régime focalisant:

$$i\frac{\partial \psi}{\partial z} - \frac{\beta_2}{2}\frac{\partial^2 \psi}{\partial t^2} + \gamma|\psi|^2\psi = 0$$





Perturbation aléatoire

Perturbation locale