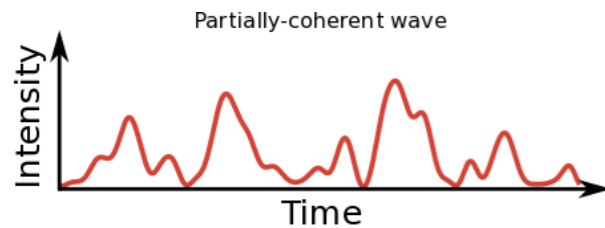


# Dispersion relation for unidirectional surface gravity waves

Alexey Tikan<sup>1</sup>, Félicien Bonnefoy<sup>2</sup>, Guillaume Michel<sup>3</sup>, Prabhudesai Gaurav<sup>3</sup>, Annette Cazaubiel<sup>4</sup>, François Copie<sup>1</sup>, Eric Falcon<sup>4</sup>, Stéphane Randoux<sup>1</sup> & Pierre Suret<sup>1</sup>

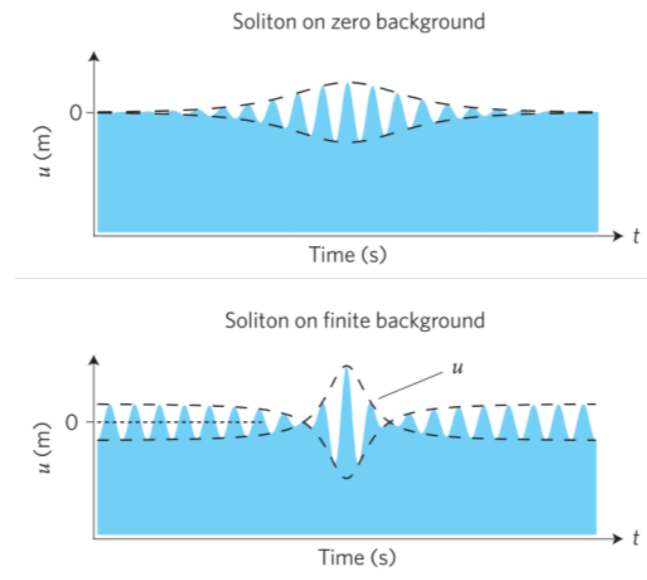
## Integrable Turbulence behind the 1-D NLS model



+

$$i \frac{\partial A}{\partial z} = \frac{1}{g} \frac{\partial^2 A}{\partial t^2} + k_0^3 |A|^2 A$$

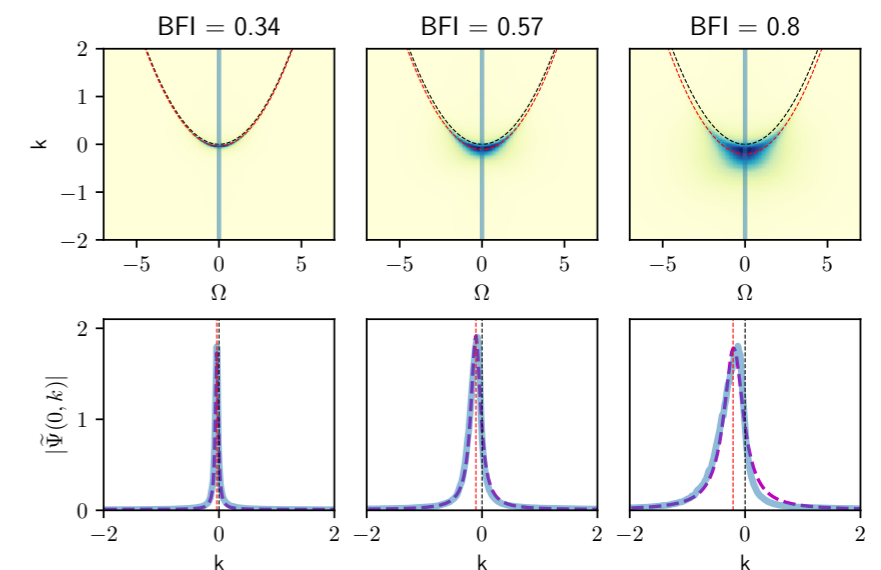
↓  
?



Dudley, J. M., et al. Nature Photonics 8, 755–764 (2014).

## Nonlinear dispersion relation in the presence of solitons

$$\tilde{k}(\omega, \epsilon) = \omega^2 / g - 2\omega_0^2 \epsilon^2 / g$$



We performed a systematic experimental study of the partially-coherent wave propagation in the water tank of École Centrale de Nantes.

