

Scaling regimes of shallow water waves

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Dispersive shallow water equations

$$\begin{cases} \partial_t h = -\partial^i (h u^i) \\ \partial_t u^j = -u^i \partial^i u^j - g \partial^j h + \nu \Delta u^j + \boxed{\frac{h_0^2}{3} \Delta \partial_t u^j} + F^j \end{cases}$$

Different observed scaling regimes

High Re

Low Ds

$$E_p^h \sim p^{-2}$$

Low Re

High Ds

$$E_p^h \sim p^{-\frac{4}{3}}$$

Analytical
results?

Functional Renormalization
Group

Wave Turbulence

