# STUDY OF NONLOCAL VISCOUS DISPERSIVE TERMS

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## 1. Abstract

In this talk, we investigate water wave models with nonlocal viscous terms in time or in space, namely

$$u_t + u_x + \beta u_{xxx} + \frac{\sqrt{\nu}}{\sqrt{\pi}} \int_0^t \frac{u_t(s)}{\sqrt{t-s}} ds + uu_x = \nu u_{xx}$$

and

$$u_t - \beta u_{txx} + \nu \Big( D^{\frac{1}{2}} u + \mathcal{F}^{-1}(i|\xi|^{\frac{1}{2}} \mathrm{sgn}(\xi) \hat{u}(\xi)) \Big) + \gamma u u_x = 0.$$

The talk will be centered at the asymptotic behavior of the solutions. Although these two equations are related and under certain conditions formally equivalent, the challenges encountered in their theoretical and numerical investigations are quite different.