

# Operator Splitting and Convergent Schemes for the KdV and Benjamin-Ono Equations

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**Abstract:** The KdV equation and the Benjamin-Ono equation are of the form  $u_t + uu_x = Au$  where  $Au = u_{xxx}$  for the KdV equation and  $Au = Hu_{xx}$  ( $H$  denotes the Hilbert transform) for the Benjamin-Ono equation. We study operator splitting for these two equations, as well as other related equations. Furthermore, we derive convergent and fully discrete finite difference schemes for the two equations.

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