

PML methods for mixed hyperbolic-dispersive equations

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The classical PML approach is first applied to the linearised Korteweg-de Vries equation. These equations are not always stable, the main obstruction being the classical condition found in the literature on PMLs that we recover in our analysis. We introduce two alternative strategies to design absorbing boundary conditions. We start from studying hyperbolic relaxation of the Korteweg-de Vries equation. In this case, the complete PML equations are not, again, completely stable. However, a version of the PML equations for this system derived without the source term is found to be stable and can absorb outgoing wave. Finally, we consider BBM-Boussinesq system that model bi-directional waves at the surface of an inviscid fluid layer. We show that the PML equations are always stable in this case. We illustrate numerically stability properties of different PML models. This talk is based on recent joint work with Christophe Besse, Sergey Gavriluk and Pascal Noble.

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