

Abstract Submitted
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Extending dispersive waves theory to use in semi-open systems¹

LYUBOV CHUMAKOVA, Univ of Edinburgh, RUBEN ROSALES, ANDREW RZEZNIK, MIT, ESTEBAN TABAK, NYU — In the classical linear dispersive wave theory the sinusoidal waves $e^{i(kx-\omega t)}$ carry energy with the group speed $c_g = d\omega/dk$. This concept is limited to the case where both the frequency $\omega(k)$ and the wavenumber k are real. On the other hand, semi-open dispersive systems allow more than just sinusoidal solutions: they can have exponentially blowing up and/or decaying solutions as well. In this talk I will address the questions of what is direction and the speed of the energy propagation for these exponential waves, extend the classical concept of group velocity, and use this theory to construct radiation boundary conditions for semi-open dispersive systems. This approach will be demonstrated on an example of dry hydrostatic troposphere which experiences effective damping due to gravity waves propagating into the stratosphere.

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