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Mathematical tools for studying internal wave equations
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For undergraduate students who are interested in physical oceanography, fluid mechanics, or wave dynamics, mathematical tools are basic and important to analyze and derive model equations and wave theories. In this paper, the derivation of internal wave equations is introduced as an example of using some mathematical tools. Two important techniques used are the perturbation analysis and the Pade approximation. Based on these techniques the long-wave equations for a two-fluid system are derived and analyzed. Some wave properties predicted by the model equations are also investigated. As mathematical tools play an important role in ocean studies, the teaching of these techniques is of great importance in classrooms.

キーワード: mathematical techniques, internal wave equations, perturbation analysis, Pade approximation
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