Japan Geoscience Union Meeting 2014
(28 April - 02 May 2014 at Pacifico YOKOHAMA, Kanagawa, Japan)

G01-P01 Room:Poster Time:April 29 18:15-19:30

An experiment of tsunami-like flow through coastal vegetation designed for classrooms

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This paper present an experiment for simulating tsunami-like bores passing over coastal vegetations designed for being performed in classrooms. Easy experimental facilities are used to display and study which layout of coastal vegetations can greatly reduce the bore speed. An acrylic tank which is divided into two regions by a movable gate is used to generate a tsunami-like bore. At the downstream region, different layouts of acrylic cylinders are placed to simulate the planting of coastal vegetations. When the gate is suddenly removed, the water in the upstream regions will flow through cylinders and go outside of the open end of the tank. The longest distance of the flow out of the tank is measured by a video camera. Finally the longest distances of all layouts are compared to find out the best design of layout for reducing the flow speed. The experiment not only can be performed in classrooms, but also provides an insight to the role of coastal vegetations in disaster reduction.

Keywords: experiment for classrooms, tsunami-like flow, coastal vegetation, disaster mitigation

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Western classical music about ocean

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The influence of ocean phenomenon on western classical music is preliminarily studied. Main purposes of this interdisciplinary study are to explore the corelation between natural ocean phenomenon and music elements and how they affect each other. Ocean phenomenon considered include the climate, wave conditions, coastal landform, and other natural events around or on the sea. For some specific music pieces, it is clear that all these phenomenon greatly influence the composers' moods and the music pieces they composed. Some music compositions specially in the 19th and the early 20th centuries will be introduced herein to elucidate the whisper between ocean and music. Finally, present idea may give a way for music teachers to include the ocean elements in their classes.

Keywords: western classical music, ocean phenomenon, interaction with ocean

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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.

Keywords: mathematical techniques, internal wave equations, perturbation analysis, Pade approximation