

On the theoretical study of internal waves in a three-fluid system

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Surface and interfacial waves propagating in a three-fluid system are studied in present paper. Two inviscid immiscible fluids lying above the other viscous fluid constitutes a three-fluid system. There are three possible wave modes generated in this fluid system: a surface wave between the air and the top fluid, an interfacial wave between two inviscid fluids, and another interfacial wave between the middle and the bottom layers. The study begins with a theoretical analysis followed by the examination of fundamental fluid and wave properties. The corresponding results have many applications in oceanography and fluid mechanics such as internal waves passing over a muddy bottom.

Keywords: three-fluid system, internal wave, viscosity