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Recently the issue of how to protect the coastal region from being damaged by incoming waves has attracted a great deal of attention. One of the wave damping mechanisms is the muddy sea bottom. The mud has been found to be efficient to damping the incoming waves. Herein an series of experiments for surface waves propagating over a muddy bottom is performed to analysis the damping mechanism from a viewpoint of energy. As very few observations and discussions on the energy transfer and dissipation were presented in past studies, the focus of present paper is the transfer and dissipation of wave energy. The wave energy is partly dissipated by the viscosity of muddy bottom which results in the damping of surface waves. At the same time, part of wave energy is transferred to the lower layer which is responsible for the interfacial wave motion. The experimental data show that the energy transferring from surface waves to the mud layer is less than 1% of total wave energy during each wave cycle. In addition, the transferred energy will accumulate with the increasing propagation distance, and finally becomes notable at the far-end side.

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