Love wave excitation due to the interaction between a propagating ocean wave and the sea-bottom topography

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This study formulates Love wave excitation in terms of the interaction between a propagating ocean wave and the sea-bottom topography. By assuming a Fraunhofer diffraction range, or far-field approximation, I theoretically derive an equivalent point force for the Love wave excitation. The equivalent point force acts in the same direction as the propagation direction of the ocean wave. The efficiency of the excitation is then investigated by employing both deterministic and stochastic models for sea-bottom topography. When a seamount given by a Gaussian function is used as a deterministic model, the equivalent point force has a narrow peak against the wavenumber of the ocean wave. On the other hand, when randomly fluctuating sea-bottom topography characterized by a power-law spectrum is used, the interaction can occur over a wide range of the ocean wave wavelength.

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