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Formation of an abnormal wave in case of interaction with a vertical barrier

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One of the possible mechanisms of emergence of freak waves near a vertical barrier, based on the dispersive focusing of unidirectional wave packets is analyzed. This mechanism is associated with the frequency dispersion of water waves and manifested in the interference of many spectral components, moving with different velocities. Formation of a single freak wave in a random wind wave field is considered in the frame of linear theory. The characteristic life-time of an abnormal wave in the framework of this mechanism for typical conditions is approximately two minutes, so thus such a rapid effect is difficult to predict and prepare for. A rogue wave quickly changes its shape from a high ridge to a deep depression.