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Observations of noise generated by nonlinear internal waves on the continental shelf during the SW06 experiment

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As part of the Shallow Water 2006 (SW06) experiment, simultaneous measurements of coastal internal wave oceanography and ocean acoustics were made over a two month period in late summer. The generation of noise by nonlinear internal waves propagating on the shelf during the SW06 experiment was observed, and is reported upon here. Three main types of noise were observed: bed noise, mid-column noise and noise from the sea surface. Surface noise is created due to an enhancement of surface wave breaking in the convergence zone created by the internal waves. Strong broadband bed noise was observed during the moments of internal wave passage above a horizontal array of hydrophones lying on the bottom. Appearance of bed noise in the form of several spikes we observed coinciding with the strongest bottom currents created by internal wave orbital currents. For the case of breaking internal waves, the near-bed spike-like noise disappeared and mid-column noise of a different character was seen instead. Mechanisms of the various types noise generation will be discussed. Work sponsored by ONR.