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**Internal gravity waves generated by convective plumes.** (English) Zbl 1189.76012  
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Summary: We present experimental results of the generation of internal gravity waves by a turbulent buoyant plume impinging upon the interface between a uniform density layer of fluid and a linearly stratified layer. The wave field is observed and its properties are measured non-intrusively using axisymmetric Schlieren. In particular, we determine the fraction of the energy flux associated with the plume at the neutral buoyancy level that is extracted by the waves. On average, this was found to be approximately 4%. Within the limits of the experimental parameters, the maximum vertical displacement amplitude of waves were found to depend linearly upon the maximum penetration height of the plume beyond the neutral level. The frequency of the waves was found to lie in a narrow range relative to the buoyancy frequency. The results are used to interpret the generation of waves in the atmosphere by convective storms impinging upon the tropopause via the mechanical oscillator effect.

**MSC:**

- 76-05 Experimental work for problems pertaining to fluid mechanics
- 76B55 Internal waves for incompressible inviscid fluids
- 76B70 Stratification effects in inviscid fluids

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**Full Text:** [DOI](#)

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