



Gravity waves excited by surface fronts and by upper-level jets in baroclinic life cycles

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Jets and fronts are known from observations to be important sources of gravity waves. However, the generation mechanisms remain poorly understood. This hinders the development of parameterisations for these sources of gravity waves in General Circulation Models.

Previous numerical investigations of the excitation of gravity waves from idealized baroclinic life cycles have emphasized the upper-level jet as the dominant source. We have used the Weather Research and Forecast Model to study this excitation of gravity waves in different idealized baroclinic lifecycles. The excitation of the waves is shown to be sensitive to the type on nonlinear development of the baroclinic life cycle. It is shown that both the upper-level jet and the surface fronts can produce significant gravity waves, with different characteristics.

The simulations also show that the horizontal propagation of these waves in the complex background flow in which they appear needs to be considered to understand their characteristics. This has implications for gravity wave parameterisations.