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Gravity waves: Contrasting observations and their representation in climate models

Observations of gravity waves entered a new era in the last decade with high-resolution satellite measurements giving global coverage. Estimates of gravity wave pseudomomentum flux became possible, which offer the chance to test and improve the treatment of gravity wave effects on the general circulation in global models. These data remain limited in both spatial and temporal sampling, leading to large remaining uncertainties in the important gravity wave properties, and these limitations likely contribute to the delay in associated changes in climate model parameterizations. So today, parameterizations of gravity wave drag remain largely guided only by theoretical and local-area numerical modelling studies, and the parameterizations are still tuned primarily with the consideration of giving the best representation of large-scale circulation and temperature structure. Can observations be used to improve on this state-of-the-art? This talk will show global comparisons of observed and modelled gravity wave parameters, and also focus in on local-area case studies that illuminate strengths and weaknesses of parameterizations of gravity wave sources. (The global comparisons are derived from an international team's work supported by ISSI and SPARC. For a list of team members and goals see <http://www.issibern.ch/teams/gravitywave/index.html> .)