GRAVITY WAVE COUPLING INTO THE TROPICAL MLT

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Gravity (buoyancy) waves play an important role in transferring momentum from source regions in the lower atmosphere to the middle and upper atmosphere. Body forces produced by breaking waves lead to residual circulations that profoundly affect the state of the atmosphere. This talk will summarize results from a campaign held near Darwin in northern Australia in January-February 2006 to measure wave generation and propagation and the associated momentum fluxes. The project used a variety of radars to study the spatial and temporal variability of rainfall and the associated latent heat release during large convective storms. A high-resolution numerical model utilized the latent heat release to compute the spatial and geographic variation of gravity wave generation and propagation into the lower stratosphere. Gravity wave ray-tracing techniques were then used to estimate the wave flux penetrating to heights near 90 km, where the results were compared with direct measurements made using a meteor radar. It is shown that there is excellent agreement between the direct and indirect estimates of wave activity. Wave fluxes show a high degree of temporal variability, with consequent variability in momentum flux deposition and wave drag.

Gravity waves, tropical convection, momentum fluxes

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