Analysis of Gravity Wave Data from Atmospheric Soundings

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— Methods to improve weather and climate predictions necessitate better observations and understanding of energy and momentum transfer in the atmosphere, particularly the phenomenon known as *gravity waves*. Gravity waves were observed by analyzing data collected from radiosondes launched from Oklahoma State University's Unmanned Aircraft Flight Station. Multiple different sources have been found which generate gravity waves, including those formed by low-level jets. Due to conduction caused by the sun heating the Earth, a propagating wind is created displacing air parcels which are the beginning production of a gravity wave. Currently, the wind observations are analyzed using a combination of the Morlet wavelet transform and the hodograph methods to identify gravity waves. Further analysis detects the location, frequency, propagation direction, and amplitude which can be used to distinguish the cause. This research accomplishes this by comparing examples from atmospheric background readings to assist in identifying the source of the gravity waves, whether that be from convection, topography, or wind shear. This research is supported by NSF.

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