

Abstract Submitted
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Gravity Wave Disturbances in the F-Region Ionosphere Above Large Earthquakes MARGIE BRUFF, North Carolina School of Science and Mathematics — The direction of propagation, duration and wavelength of gravity waves in the ionosphere above large earthquakes were studied using data from the Super Dual Auroral Radar Network. Ground scatter data were plotted versus range and time to identify gravity waves as alternating focused and de-focused regions of radar power in wave-like patterns. The wave patterns before and after earthquakes were analyzed to determine the directions of propagation and wavelengths. Conditions were considered 48 hours before and after each identified disturbances to exclude waves from geomagnetic activity. Gravity waves were found travelling away from the epicenter before all six earthquakes for which data were available and after four of the six earthquakes. Gravity waves travelled in at least two directions away from the epicenter in all cases, and even stronger patterns were found for two earthquakes. Waves appeared, on average, 4 days before, persisting 2-3 hours, and 1-2 days after earthquakes, persisting 4-6 hours. Most wavelengths were between 200-300 km. We show a possible correlation between magnitude and depth of earthquakes and gravity wave patterns, but study of more earthquakes is required. This study provides a better understanding of the causes of ionospheric gravity wave disturbances and has potential applications for predicting earthquakes.

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