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Medium-scale gravity waves in the mid-/low-latitude dayside upper thermosphere as observed by the CHAMP accelerometer

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Although a number of studies had investigated gravity waves (GWs) in the upper thermosphere, details of their global climatology at mid-/low-latitudes remained unknown. Here we report a detailed climatology of the medium-scale (150-600 km) GW in the mid-/low-latitude dayside upper thermosphere, as observed by the CHAMP accelerometer (at about 300-400 km altitude) from 2001 to 2010. The mid-latitude GWs exhibit higher activity in the winter hemisphere than in the summer hemisphere. GWs near the Andes and the Antarctic Peninsula during June solstice are stronger than in any other place and season. The low-latitude GWs are generally stronger above continents than above the oceans. The relative fluctuation amplitude of GWs is higher during solar minimum than during solar maximum. All these characteristics are in reasonable agreement with those of the stratospheric GW climatology reported previously. The consistency supports recent theoretical and observational reports on the primary/secondary GW propagation from the stratosphere to the upper thermosphere.