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A climatology of multiple tropopauses from GPS radio occultation data

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A global climatology of multiple tropopauses (MT) is discussed based on Global Positioning System (GPS) radio occultation (RO) data from the German CHAMP (CHAllenging Minisatellite Payload) and the US-Argentinian SAC-C (Satelite de Aplicaciones Cientificas-C) satellite mission for the period May 2001-February 2006. In this study we present detailed investigations about the geographical and temporal distribution of MT during different seasons. The thickness of the layer between the lowest (first) and highest (last) lapse rate tropopause has a strong annual cycle. In the vicinity of the subtropical jet (STJ) stream region values vary between 4-5 km during winter and 2-3 km during summer, respectively, whereas higher differences were found on the northern hemisphere. It is shown that the occurrence distribution of MT is a suitable indicator for the mean climatological location of the STJ, in particular during winter time.