Dynamical Response of Low Latitude Mesosphere and Lower Thermosphere to the Major Sudden Stratospheric Warming Events in the Northern and Southern Hemisphere

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A stratospheric sudden warming (SSW) is a dramatic large-scale event in the winter middle atmosphere lasting several days or weeks. It involves profound changes in temperature and wind system, with > 15 K warming at stratospheric altitudes and 20-50 K cooling at mesospheric altitudes. The mesosphere and lower thermosphere (MLT) wind observations from Medium Frequency (MF) radar situated at Hawai (21^oN, 200^oE) and Rarotonga (22^oS, 200^oE) are used to investigate the SSW effects in the MLT circulation during winter of the years 2005-2006 in the Northern Hemisphere and 2002 in the Southern Hemisphere. These two winters were identified as major warming years according to the WMO. Preliminary results reveal that change in the eastward winds to westward flow is observed one week before the onset of SSW during boreal winter and austral winter. After SSW, the circulation turned into its normal winter condition. The results are compared with mesospheric observations made during Northern Hemisphere and Southern Hemisphere SSW. Results from this work are discussed in the context of the known processes that reversal in the mesospheric winds precedes the warming events and planetary wave variability during SSW events in the Northern Hemisphere and Southern Hemisphere.