



Major Sudden Stratospheric Warming events and the north Atlantic eddy driven jet for 1958-2014 winters

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The Sudden Stratospheric Warming (SSW) events are a clear manifestation of the two-way coupling between troposphere and stratosphere. These events result in cold to very cold weather conditions over Europe and North-east America. Here in this study, we explore the relationship between the major SSW events and the north Atlantic eddy driven jet for December-March (DJFM) season over the period 1958-2014. The Japanese Re-analysis data (JRA-55) for the daily zonal wind averaged over 925-700 hPa and the vertical component of Eliassen-Palm (EP) fluxes at 100 hPa associated with the zonal wave number 1, 2 and 3, have been used for the analysis. There is a highly significant relation between SSWs and the jet latitude variability of the north Atlantic eddy driven jet. The composite analysis shows a poleward jet one week before the significant SSW event whereas an equatorward jet for more than a week after a SSW event. The higher deviation in wave number 2 EP fluxes compared to wave number 1, for pre-SSW event is observed. A given higher wave activity from all the zonal wave numbers correspond to higher probability of the northern mode of the jet. Furthermore, an attempt has been made to explore the mechanism for the different preferred states of the eddy driven jet and the wave activity in the stratosphere.