A climatology of Mediterranean severe weather events using the Advanced Microwave Sounding Unit (AMSU)

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The Mediterranean basin is an area of frequent cyclonic activity, where both local effects and large scale dynamics have significant contribution to the extent and severity of weather events. Synoptic-scale perturbations such as southward stratospheric intrusions are often precursors of surface cyclogenesis and occurrence of extreme events.

AMSU-A and AMSU-B microwave instruments, both onboard NOAA satellites, are able to detect upper-level intrusions and to locate heavily precipitating areas, respectively. Such diagnostics using AMSU channels are used to perform a climatology of severe weather events in the Mediterranean basin, for the period of 2001-2006, to form a typology of precipitating systems and upper level intrusions, based on their relative positions, frequency, and size.

By forming such climatology we are able to determine whether whenever an intrusion is detected there is precipitation and/or heavy rainfall. We also investigate the importance of the shape, axis of orientation and amplitude of such intrusions for the occurrence of storms, and whether there is a geographical preference for its occurrence. Moreover, the analysis of monthly, seasonal and annual climatologies allows to investigate the seasonal and/or interannual variability of these systems.