Geophysical Research Abstracts, Vol. 7, 02388, 2005
SRef-ID: 1607-7962/gra/EGU05-A-02388

A simplified model of the warm conveyor belt accompanying extreme precipitation events over North-Eastern Italy

A. Bertò (1), D. Zardi (1) and A. Buzzi (2)

(1) University of Trento (alessio.berto@ing.unitn.it), (2) Institute of Atmospheric Sciences and Climate (ISAC) of the Italian National Research Council

In the present work a Lagrangian methodology for the reconstruction and the analysis of the airstreams governing the transport of water vapour has been set up and tested on 3 extreme precipitation events occurring in the last decades over the Alps (3-5 November 1966, 16-18 November 2000 and 24-26 November 2002). The analysis outlines that the precipitation over Trentino (North-East of Italy) is strongly conditioned by the evaporation rate and by the airmasses properties over the Central Mediterranean area. In particular most of the water vapour contributing to the ending precipitation over the Alps originates over Tunisia, the coastal regions in the eastern Algeria and in the western Lybia, the Channel of Sicilia, the Gulf of Gabes and the southerly Thyrrenian Sea. A simplified conceptual model is also proposed to visualize the traits of the moist airstreams inside the Mediterranean cyclones. The airstreams ending at the lower levels over Trentino have the characteristics of W2 warm conveyor belt (Browning and Roberts, 1996): they originate over the Central Mediterranean Sea, are very moist and relatively cold; their lifting and precipitation production is generally enhanced by the position of the Alpine chain. The airstreams ending at the higher levels over Trentino have the characteristics of W1 warm conveyor belt although their contribution to the precipitation over the Alps is moderate because they flow for a long time over the Sahara desert. The trajectory populations of the two portions of WCB is a crucial factor controlling the precipitation production.