EUROPEAN CLIMATOLOGY OF SEVERE CONVECTIVE STORM ENVIRONMENTAL PARAMETERS: A TEST FOR SIGNIFICANT TORNADO EVENTS

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ABSTRACT

A climatology of various parameters associated with severe convective storms has been constructed for Europe. This involves using the reanalysis data base from ERA40 for the period 1971-2000 and calculating monthly means, variability range and extrema ocurrence of fields such as CAPE, convective inhibition energy, mid-tropospheric lapse rate, low-troposheric moisture content and storm relative helicity for different layers. Whereas the occurrence of severe convective storms in Europe is, and has been, somewhat erratic and sporadic, the real climatology of severe convection is surely much more substantial than existing occurrence records would indicate. Thus, it is anticipated that by using an appropriate set of parameters that are recognised as relevant to severe convective storms, it should be possible to create a "synthetic climatology" of the occurrence frequencies by considering the time and space distributions of where these parameters become favorable for severe convective storms. The present content of this climatology and other future developments will be available to the public at the web site http://ecss.uib.es, where the user can graphically display any product of interest in an interacive way. Preliminary results derived from these products will be presented during the ECSS 2004 conference.

On the other hand, the previous climatology has been complemented with a collection of existing reports of significant (at least F2) tornadoes in Europe during the period 1971 to 2000. This collection of events and the corresponding values attained within the considered environmental parameter space on the days of the events will be also included in the http://ecss.uib.es web site. Thus, the tornadoes collection will be used to test the appropriateness of the parameters selected for the synthetic climatology, although it also should be an important contribution in its own right to the climatology of severe convection in Europe.

It is hoped that our web site could serve as a seed of an unified climatological data base of severe convection for Europe. Thus, contributions from the ECSS community will be solicited during the conference to complete and improve the web data base.