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Towards a detailed knowledge about Mediterranean flash floods and extreme floods in the catchments of Spain, France and Italy

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It is important to remember that scientific research programs of the European Commission and contributors had implemented a multidisciplinary (geography, history, meteorology, climatology, hydrology, geomorphology, geology, paleohydrology, sociology, economy.....) better knowledge and more understanding of the physical risk assessment of disastrous floods (particularly flash floods) with rising factors of vulnerability and perhaps climate change at the end of the XX1 century, in the triangular geographical area Zaragosa (Spain)-Orléans (France)-Firenze (Italy).

With reference to historical floods events observed from last two centuries in Spain (Catalonia), France (Languedoc Roussillon – Provence Alpes Cote d'Azur-Corse-Rhone Alpes –Auvergne- Bourgogne) and in Italy (Ligurie – Piemont – Lombardie) we lay particular stress on a detailed understanding of the spatial and temporal scales of the physical dynamic process being at the origin of locals or extensive flash floods.

This study requires to be based on the meteorology (atmospheric circulation patterns ,on west Europe- Atlantic and Mediterranean sea) responsible, with relief and sea surface temperature, of high precipitations (amounts, intensities), air temperature, discharges of high floods, observed in the past ,on large and coastal rivers.

We will take example of the Rhone river catchments, in connexion with Po-Ebre-Loire-Seine rivers, based on the studies of thirty high historical floods occurred from 1840 to 2005, and characteristics of Oceanic and Mediterranean weather situations, sometime alternated.

Since recent years we have the daily mean sea level pressure dataset (EMSLP) reconstructions for European-North Atlantic Region for the period 1850-2006. So it is now possible to allow us the selection in the complete meteorological dataset during 1950- 2009 period by an analog method (like operational daily applications from 1969, at Electricity of France) to select weather situations similar to historical daily situations responsible of extreme floods with larges discharges, with the conditional precipitations associated on catchments with god and up to date observations of precipitations (daily, hourly). This kind of complete studies would be very useful for:

-Statistical–physical studies of extreme rainfall-flood events (peak discharge, volume), frequency-probability-uncertainty (GRADEX and SHADEX methodology),
-Better forecasting of meteorological (precipitations) and hydrological (floods) events, during crisis situations,
-better understanding of the historical variability in the past 2 centuries (atmospheric features, precipitations, discharges high/low),
-Better adjustment of modelling simulation,
-Better identification and probabilistic approach of uncertainties.