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An analysis of the characteristics of extratropical cyclone Klaus

Iñigo Gómara (1), Concepcion Rodriguez-Puebla (2), and Carlos Yague (1)

(1) University Complutense of Madrid, Geophysics and Meteorology, Madrid, Spain (i.gomara@estumail.ucm.es), (2) University of Salamanca, Atmospheric Physics, Salamanca, Spain (concha@usal.es)

Klaus was a very destructive extratropical cyclone that affected the south-west of Europe from the 23rd to the 25th of January 2009. In particular, it impacted over northern Spain, southern France and Italy where losses totalled billions of Euros and the death toll was 31. The extreme strength of the wind gusts generated by the storm was the main reason for the damage caused. Klaus had the properties of a cyclonic "bomb", and a brief meteorological description of the windstorm will be presented based on surface and upper-air reanalysis data. The analysis procedure has been based on earlier research carried out in this field by J. R. Gyakum (1980), Lance F. Bosart (1984) and J.R. Reed (1986). Klaus was formed under very favourable growing conditions in the North Atlantic ocean: a high atmospheric baroclinicity level due to high temperature and absolute humidity horizontal gradients and strong upper-air winds. In addition, the surface low that started as a stationary front interacted with a mobile upper trough that was located at an altitude of 9000 m near the surface low on the 23rd of January. A strong polar jet stream region above the surface incipient low was also located in the same region of the storm's growth, around 40W-42.5N. After its formation and interaction with the mobile upper-trough, Klaus moved very fast eastwards until it reached land in France on the 24th. We will discuss some social and economic impacts of the storm and the intervention of governments and weather services before, during and after the windstorm.

References

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