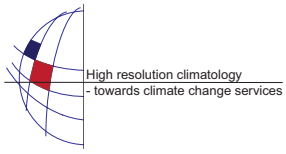
EMS Annual Meeting Abstracts
Vol. 7, EMS2010-256, 2010
10th EMS / 8th ECAC



Klaus - an exceptional winter storm over Northern Iberia and Southern France

M.R.L. Liberato (1,2), J.G. Pinto (3), I.F. Trigo (1,4), and R.M. Trigo (1)

(1) CGUL, IDL, Faculty of Sciences, University of Lisbon, Lisbon, Portugal, (2) Physics Department, University of Trás-os-Montes and Alto Douro, Portugal, (3) Institute for Geophysics and Meteorology, University of Cologne, Germany (jpinto@meteo.uni-koeln.de), (4) Institute of Meteorology, Lisbon, Portugal

The synoptic evolution and impacts of storm Klaus that swept through northern Iberia and southern France on 23-24 January 2009, are assessed. Klaus followed an unusual southern path and was the costliest weather hazard event worldwide during 2009. In particular, it was the most intense and damaging wind storm in the region in a decade, provoked more than 20 casualties and insured losses of several billion Euros. Several long-term records of maximum wind speed gust were broken, including Bordeaux, Narbonne and Perpignan. Storm Klaus first developed close to the Bermudas, traveled fast eastwards and underwent explosive development near the Iberian Peninsula. Its development was supported by an extended and intensified polar jet which stretched down to Western Europe and strong upper-air divergence associated with a second jet streak. Afterwards, it steered southeastwards across Southern France into Northern Italy and the Adriatic.

The evolution of “Klaus” is analysed using two standard cyclone detecting and tracking schemes. Results show that both tracks exhibited similar features and positions throughout almost all of their lifecycles, with minor minor discrepancies. These are likely associated to the fields used by each method for storm identification (near surface geopotential height and geostrophic vorticity, respectively) and to different handling of the spatio-temporal evolution of multiple cyclone candidates. In its strengthening phase, “Klaus” presents deepening rates above 37 hPa/24h, a value that after geostrophically adjusted to the reference latitude of 60ºN increases to 44 hPa/24h, implying an exceptional event with bomb characteristics. During the maximum intensification phase, the laplacian of surface pressure increased by 1.165hPa/(deglat)2 within 24 hours.