



Multivariate Approach to Recognise Emission Patterns Provoked for “Forest Fires”. Case Study: Continental Portugal - Summer Episodes of 2002 and 2003

A. M. Ramos (1), F. C. Conde (1), **P. S. Lucio** (1), S. Freitas (2), K. Longo (2), F. S. Recuero (2), D. S. Moreira (2)

(1) Geophysics Centre of Évora (CGE), University of Évora. Rua Romão Ramalho, 59. 7000-671. Évora, Portugal. (andramos04@yahoo.com.br). (2) Center for Weather Prediction and Climate Studies - CPTEC/INPE. Rodovia Presidente Dutra, km 39. 12630-000. Cachoeira Paulista. São Paulo, Brazil. (sfreitas@cptec.inpe.br)

The 2003 summer was the most severe fire seasons experienced during the last decades in Southern Europe, although the greatest fire severity was mostly concentrated in Portugal and France. Portugal experienced by far the worst forest fire season that the country has faced in the last 23 years, with a total area burned of almost 5 times the average, where a number of major fires affected large portions of their natural environment, different of the 2002 that was one of the best in the last decade. The situation in Portugal was not as favourable fires for several reasons with meteorological conditions in the summer period did not deviate in excess from other years, but there were periods of intense heat and presence of winds during which many fires took place simultaneously. The objective of this work is to accomplish statistical analysis to evaluate the performance of the 3-D transport model CATT-BRAMS (Coupled Aerosol and Tracer Transport to the Brazilian developments on the Regional Atmospheric Modeling System) coupled to an emission model in numerical modeling of the atmospheric transport of gases and particles emitted by burning during the occurrence of fires that affected Continental Portugal for two different situations, in August 2002, characterized for normal pattern and August 2003 by an atypical pattern. The statistical methodologies understand in multivariate techniques: Principal Components Analysis (PCA) and Cluster Analysis (CA). The CATT-BRAMS explores the BRAMS tracer transport capability of using slots for scalars. It is an on-line transport model fully consistent with the simulated atmospheric dynamics. The sources emis-

sion from biomass burning and technological activities for several gases and aerosol may be defined from several published dataset and remote sensing. The mass concentration prognoses accounts also for convective transport by shallow and deep cumulus, wet and dry deposition and plume rise. The initial and lateral boundary conditions necessary to drive CATT-BRAMS were provided by the twice daily Aviation run of the National Center for Environmental Prediction Global Spectral Model (AVN) with a horizontal resolution of 20 km. The resolution grid covering Continental Portugal and narrows strip of Atlantic Ocean. The simulation covered 384 hours beginning July 31 at 00:00 UTC. The vertical resolution starts at 100 m near the surface, stretching at a rate of 1.2 to a final resolution of 850 m, with the model top at about 20 km. The model results indicate that the modeled represent adequately the observed under different conditions and statistical analyzes.