

## **Fog and mist forecast by the PAFOG model at the Northeast Brazilian airports.**

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Adverse weather phenomena cause economic and social losses. Its formation is associated with atmospheric conditions and synoptic scale systems. Therefore, forecast methods of adverse phenomena have to be created worldwide for each specific region. Different studies were performed previously in the Synoptic Meteorology and Physics Laboratory of the Institute of Atmospheric Sciences (ICAT UFAL). Some of these results were published in papers and books. The objective of this paper is to study fog in the tropical region, where there is information lack about its formation process. The next methodologies and data from different sources were used: a) surface data of the Meteorology Network of the Aeronautics Command and the National Institute of Meteorology; b) radiosonde data of the Center for Weather Forecasting and Climate Studies (CPTEC); c) images of the GOES and METEOSAT satellites available by CPTEC in visible, water vapor and infrared channels; d) reanalysis products of the NCEP/NOAA Reanalysis 2, ERA-Interim (ECMWF) and CFSv2 (NCEP/CFSR-NCAR) numerical model were used for synoptic analysis. GrADS and NCL softwares were used to plot the meteorological fields and simulated vertical profiles. There were 125 fog events in the airports of Maceio and Campina Grande from 2008 to 2016. The processes of fog formation in the two cities were different. Influence of a trough at the low levels was detected in most cases in Maceio. Different fog mechanisms were observed in Campina Grande: a) influence of a ridge; b) convective cloud formation during the fog (atypical); c) rained (one case). However, both cities had similar conditions. All events occurred by dawn and early in the morning. The PAFOG model presented satisfactory results in Campina Grande predicting fog for 12 and 6 hours. In Maceio it was not satisfactory. It is important to note that for the most fog events PAFOG model predicted reduced horizontal visibility. The study results can be used to elaborate the adverse phenomena forecasting methods for the Brazilian Northeast.