



A fully coupled regional atmospheric numerical model for integrated air quality and weather forecasting.

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A new numerical modelling tool devoted to local and regional studies of atmospheric chemistry from surface to the lower stratosphere designed for both operational and research purposes will be presented. This model is based on the limited-area model CATT-BRAMS (Coupled Aerosol-Tracer Transport model to the Brazilian developments on the Regional Atmospheric Modeling System, Freitas et al. 2009, Longo et al. 2010) which is a meteorological model (BRAMS) including transport processes of gaseous and aerosols (CATT model). BRAMS is a version of the RAMS model (Walko et al. 2000) adapted to better represent tropical and subtropical processes and several new features. CATT-BRAMS has been used operationally at CPTEC (Brazilian Center for Weather Prediction and Climate Studies) since 2003 providing coupled weather and air quality forecast. In the Chemistry-CATT-BRAMS (called hereafter CCATT-BRAMS) a chemical module is fully coupled to the meteorological/tracer transport model CATT-BRAMS. This module includes gaseous chemistry, photochemistry, scavenging and dry deposition. The CCATT-BRAMS model takes advantages of the BRAMS specific development for the tropics/subtropics and of the recent availability of preprocessing tools for chemical mechanisms and of fast codes for photolysis rates. Similarly to BRAMS this model is conceived to run for horizontal resolutions ranging from a few meters to more than a hundred kilometres depending on the chosen scientific objective. In the last decade CCATT-BRAMS has being broadly (or extensively) used for applications mainly over South America, with strong emphasis over the Amazonia area and the main South American megacities. An overview of the model development and main applications will be presented.