Soil moisture impact on convection and biomass burning pollutants in Roraima, Brazil, during the CLAIRE/1998 Experiment

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The aim of this work is to evaluate the relevance of soil moisture spatial distribution on formation and development of a mesoscale convective system occurred on March 18th, 1998 in the Amazon Basin. Previous studies have shown that this convective system imposed strong vertical motion to the pollutants emitted by the huge fire in Northern Roraima State during the same period. Afterwards, the high-level circulation transported the aged smoke towards Suriname which was identified from measurements performed by instrumented aircraft measurements during the CLAIRE-98 experiment. The soil moisture is obtained from a simple hydrological model, which uses satellite antecedent precipitation estimative as input information. The inclusion of updated vegetation and soil textural classes over the entire domain allowed a better description of both biophysiologic and soil features. The atmospheric system simulation was performed by the BRAMS model, which was coupled with a lagrangean transport model (STILT). Both system position and structure were more adequately reproduced when spatially heterogeneous soil moisture was available at the start time. Moreover, the trajectories which were derived from the simulation with heterogeneous soil moisture seemed more efficient to explain the measurement found in Suriname, indicating the relevance of having a realistic soil moisture field from the beginning of simulation.

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