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# Study of the shallow convection over the Belem region in Brazil

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The largest forest of the world, the Amazon, presents an interesting and very complex system mixing forests, various topographies, sites of deforestation, cities, and regions close and far from the coast, which influence the climatology of the region. This study was focused in the region of Belem which is considered the rainiest region in the eastern Amazon with precipitation around 2000 mm/year. Belem is the capital of Para state, which is located in northern Brazil, 2,146 kilometers from Brasilia with an area of about 1,059,458 km$^2$ and a population of 1,432,844 inhabitants with 26% of the area of the Brazilian Amazon and having 49% of its natural attractions, according to the Organization of American States. Shallow convection and deep convection are among the main components of the local energy balance. An analysis of the performance of the Jet Propulsion Laboratory /NASA model of shallow convection parameterization in a framework of the single column model (SCM) in relation to the cluster of cumulus clouds formed in the coastal region of the Amazon forest due to squall lines is provided. To achieve this purpose infrared images from the Geostationary Operational Environmental Satellite (GOES), visible images from the GOES-12/METEOSAT satellites, and data obtained by the “Cloud processes of the main precipitation systems in Brazil: A contribUtion to cloud resolVing modeling and to the GPM (GlobAl Precipitation Measurement)” – CHUVA - campaign, during the month of June of 2011, were used. Results demonstrated that the parameterizations performed well in the case where only a core of clouds was observed.