



## **RegCM4.7 performance in simulating the lifecycle of the South American Monsoon System**

Michelle Reboita (1), Rosmeri da Rocha (2), Erika Coppola (3), Taleena Sines (3), Marta Llopart (4,5)

(1) Natural Resources Institute, Federal University of Itajubá, Itajubá, Brazil (reboita@unifei.edu.br), (2) Department of Atmospheric Sciences, University of São Paulo, São Paulo, Brazil (rosmerir@model.iag.usp.br), (3) Earth System Physics Section, The Abdus Salam International Centre for Theoretical Physics, Trieste, Italy (trsines0@gmail.com), (4) Departamento de Física, Universidade Estadual Paulista Júlio de Mesquita Filho, Bauru, Brazil (marta@fc.unesp.br), (5) Centro de Meteorologia de Bauru (IPMet), Bauru, Brazil

The wet period of the South American Monsoon (SAM) system is responsible for more than 60% of the precipitation in several areas of the tropical-subtropical South America. As the rainfall impacts all sectors of the society (agriculture, energy etc.), it is important to understand how atmospheric models reproduce the SAM lifecycle. In this study, the performance of the Regional Climate Model version 4.7 (RegCM4.7) in simulating the SAM lifecycle is evaluated. RegCM4.7 with 25 km of grid spacing was nested in ERA-Interim reanalysis for the period 1979-2014. The Common Land Model 4.5 (CLM4.5) and the combination of two cumulus convective parameterization schemes, Tiedtke over the land and Kain-Fritsch over the ocean, were used in the simulation. SAM lifecycle was defined with a similar methodology from Liebman and Marengo published in 2001, which is based on the accumulated precipitation. For the period 2005-2014, the SAM was identified in the simulated and observed (from the Climate Prediction Center – CPC) precipitation. From southern Amazonia to southeastern Brazil, the SAM onset in CPC is registered between 57 and 59 pentads, while the model delays it to 60-pentad. On the other hand, the SAM demise occurs before in RegCM4.7 than in CPC, which led to a slightly shorter SAM duration in the model. Even though simulating a shorter SAM lifecycle, RegCM4.7 is able to reproduce the observed spatial pattern of SAM.