

## ***Interactive comment on “Regional Simulation of Indian summer Monsoon Intraseasonal Oscillations at Gray Zone Resolution” by Xingchao Chen et al.***

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This paper reports on simulation of the Indian Monsoon for five seasons with a regional climate model that has fine enough spatial resolution (9 km) to capture convection explicitly. The presentation of results in terms of monsoon break and active periods, and their relationship to the Monsoon Intraseasonal Oscillation, is quite thorough. Other than issues of grammar, the paper is quite readable and informative. There are a few concerns that should be addressed, however, before the paper is accepted in final form.

(1) More discussion should be given to the role of the boundary conditions (here from

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ERA-Interim). These boundary conditions constrain the planetary scale flow to be close to analyses. Can the authors speculate how well a global model of this resolution would in simulating the Indian Monsoon, even in the mean?

(2) Related to (1), on lines 80-81 the authors state that: “Results show that GCMs are able to capture the fundamental features of the monsoon circulation reasonably well and also show some skills in reproducing the seasonal-averaged distributions of the monsoonal rainfall...” This may not be a valid generalization – this reviewer has the impression that some very high resolution global GCMs still have significant errors in the simulation of the mean Indian monsoon rainfall.

(3) Greater physical explanation of the MISO indices, based on “nonlinear Laplacian spectral analysis technique” should be given. One way in which this appears to differ from the multichannel singular spectral analysis (applied by, for example, Krishnamurthy and Shukla, 2007) is that the latter gives two distinct periods for MISO oscillations (45 and 20 days), while the method applied by the authors gives a single oscillation. Why the difference.

(4) What is the effect of the model top at 20 hPa and suppression of vertically propagating gravity waves?

(5) Figure 5 should show the seasonal mean Indian monsoon rainfall for each year, a single number for each year. This is referred to often, but not shown.

(6) The grammar of the article needs to be thoroughly checked and improved.

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