Nonlinear Processes
in Geophysics
Discussions

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Interactive comment on "Logit-normal mixed model for Indian Monsoon rainfall extremes" *by* L. R. Dietz and S. Chatterjee

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The authors have performed very interesting analysis on using data driven methods for understanding the variability of Indian rainfall extremes. They have used GLMM and observed the association of extreme rainfall with ENSO events. This work is of highest quality and in my opinion this work is worth publishing. However, I have few comments, which the authors must address and this may reveal new finding.

1. Indian rainfall is associated with ENSO and onset of discharge in Nino-3.4 region leads to drought in India. The occurrences of high precipitation extremes are less in drought years and this is a well known fact. What the authors have missed, is that, the non-enso drought years are associated with Indian Ocean Dipole Moment (Saji et al., 1999, Nature 401, 360-363) and hence it is essential to consider the same as an extra

co-variate and I am sure the authors will get an improved results.

2. The other climatic fact, which the authors have missed, is the association with Indian ocean warming and del TT (tropospheric temperature difference). There is a hypothesis that Indian ocean warming leads to reduction in delTT which in turn reduces monsoon circulation and hence these indicators are very important. For details, please see, Goswami and Xavier (2007), Quarterly Journal of the Royal Meteorological Society, Volume 133, Issue 624, pages 749–764, April 2007. and also Bawiskar (2009), Journal of Earth System Science, August 2009, Volume 118, Issue 4, pp 273-280

3. One of the major hypothesis, associated with extremes, is that, local changes and local heterogeneity may lead to spatial variability of extremes, and possibly this is due to the feedback from vegetation. Is there any way, the authors may use NDVI as one of covariate along with elevation to see its importance.

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