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Climate of the Past Discussions

Interactive comment on "Early Pliocene vegetation and hydrology changes in western equatorial South America" *by* Friederike Grimmer et al.

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This study generated new vegetation and climate record between 4.7 and 4.2 Ma by pollen analysis of 46 samples from ODP Site 1239A, which is located in the East Equatorial Pacific, a place suitable for investigating the precipitation-related fluvial runoff changes in northwestern South America, thus good for monitoring the past movement of the ITCZ. A major aim of this study is to clarify a mismatch about the ITCZ shift in the early Pliocene between the proxy records and the model simulation, that most proxy data supports a southward shift whereas numerical modelling suggests a northward shift in response to Central American Seaway closure and Andean uplift. Generally, this study fills the blank of well dated hydrological record of the early Pliocene in this region by pollen and spores studies from marine sediment.

Generally, I agree with the comments posted by the other three referees and won't repeat it. Here are some minor suggestions, which I think should help the readers to better understand this research if considered.

Age model. How did the authors establish the age model for the study interval of Site 1239? From Tiedemann et al. (2007)? Why not add the benthic d18O record to the figures and sign labels of Marine Isotope Stages? You cannot just cite a reference to get all the necessary things done.

Continuity of the record. Since other palynological studies of the region have been conducted for the mid-Pliocene to the Holocene, why not combine those records with the new record of the early Pliocene? Are they from the same marine core? The new record depends on 46 samples to cover the time interval of 4.7-4.2 Ma, with an average time resolution of 11 Kyr. In such a relatively short period and with a relatively low time resolution, the authors still recognize four major steps of the vegetation changes, and claim that all the vegetation belts as explained in Figures 3 and showed in Figure 4 display synchronous increase/decrease for each stage. If carefully examining figure 4, the features of the variability of the vegetation belts just constrainedly match those described in the text. The referee RC1 also pointed it out. Increasing the time resolution such as doubling, and filling the hiatus between cores 35X and 36X of Hole 1239A (there should be also vegetation change in this interval), something very different probably could happen. Also as indicated by Referee RC1, the unpublished data which is so important to support the author's conclusion of a low percentage of lowland rainforest before 4.7 Ma should be put together with the presented record of this manuscript. I believe that all readers with interests for the ITCZ shift in the early Pliocene would like to see a continuous record since the early Pliocene rather than a segmented record in such a narrow period.

About permanent Elñio, closure of Central American Seaway and Andean uplift. My suggestion is weakening the discussion on these comprehensive topics but focusing on its significance in indicating the hydrological changes. The new pollen records are not

strong evidences to support the so ambitious conclusions in the present manuscript.

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