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Climate of the Past Discussions

Interactive comment on "Rapid shifts in South American montane climates driven by pCO_2 and ice volume changes over the last two glacial cycles" *by* M. H. M. Groot et al.

Anonymous Referee #1

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This paper presents a first and very interesting attempt of quantitative climate reconstructions of past abrupt shifts in the northern Andes. The authors used different available and up-to-date softwares, methods and models to reconstruct terrestrial past temperatures of a long sequence. However the conclusions of the paper lacks clarity and do not reflect the title. I suggest to improve the last part of the paper and to discuss the datas in the light of the new results brought by this recombination of methods and datas. It is sometimes difficult to separate the new datas from old publications e.g. the LGM lapse rates from the new reconstructed ones. The authors show that "the large scale orbital-induced vegetation changes can be explained by the ~100 kyr and obliquity (41 kyr) dominated glacial-interglacial global temperature..". However I do not

agree with the last phrase of the conclusion "...has revealed that sub alpine climates in the northern Andes and associated ecosystems react very sensitive ..." as the paper did not explain much about the responses of the vegetation itself.

More particularly questions such as: We know about the vegetation at Cariaco but what is the vegetation composition during the Heinrich events in lake Fuquene? After all these reconstructions can the authors differenciate different types altitudinal shifts? are they the same for Ti-Tii , Tiii? for all the Heinrich events 8, 12, 14? why don't we record the other Heinrich events? what shows the vegetation during other abrupt changes? what are the amplitudes of the shifts?

need to be better detailed.

Therefore I suggest to rewrite the last part of the discussion and include a more detailed and critic review of the new results obtained.

Interactive comment on Clim. Past Discuss., 6, 2117, 2010.