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Interactive comment on "Landscape-scale changes in forest structure and functional traits along an Andes-to-Amazon elevation gradient" *by* Asner et al.

Anonymous Referee #1

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General comments:

This study aims to assess forest canopy structural and functional properties along an altitudinal transect located in the Peruvian Amazon-Andes interface. The authors used data from LIDAR to overlap and significantly enlarge (from 1 ha to 25ha) the plot-based sampling employed in several publications that characterize and describe forest structure and function along this altitudinal gradient. The use of this Airborne technology opens new doors for improving our understanding about the role played by the environmental variability on determining forest functioning. I think that the work made by Asner and colleagues posits and reinforced the new roads built-up by many of the authors, which effectively link remote-sensed data to forest ecology and conservation.

The work perfectly fits the BGD aims, and I think that it is almost ready for publication in its current stage. A couple of minor comments are included in the specific comments.

Specific comments.

Methods.

Despite of the new technology employed significantly enlarged the field-based 1 ha plots, the sampling design still suffers of pseudo-replication. Indeed, plots located at an altitude below 400 masl (11) could be considered true replicates, but not the rest. The remaining plots over 400 masl are not real replicates, which may be taken into account by the authors throughout the text, but particularly in the discussion.

Discussion.

Page 15430, second paragraph (lines 6 to 18). There are some issues related to the problem stated above that deserves clarification in line with the sampling limitations. When the authors conclude that . . ."western Amazon lowlands harbor variation in canopy functional traits often exceeding that produced by 3200 m of elevation change to Andean treeline", they need to take caution. The variability assessed across each altitudinal sites in terms of soils and physiography varies significantly between lowland and highland plots. Likewise, they claimed that lowland canopies respond to geological, hydrological, and soil fertility variation, which is expressed in shift-community composition. . .. . I really think that you are entering here in some degree of speculation when assume that floristic changes are related to canopy reflectance. Due to you are no testing that, I would recommend to focus your conclusions on the structural properties evaluated rather than including claims still under debate. In fact, the work that claimed the existence of a fine-grain relationship between canopy reflectance and plant species composition is the Tuomisto et al. (1995) paper, and not the reference employed by the authors (Tuomisto et al. 2003).

Interactive comment on Biogeosciences Discuss., 10, 15415, 2013.