



Endemic and exotic tropical forests of Réunion Island observed by airborne lidar

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Tropical forests are vital ecosystems widely threatened across the globe and yet remain the most difficult forest type to document. They are strongly perturbed by anthropogenic activities, which lead to coexistence of endemic and exotic tree species. We present an experiment performed over Réunion Island in May 2014, on sites ranging from coastal to rain forest, including tropical montane cloud forest as found on the Bélouve plateau. Réunion Island is home to the last remnants of primary tropical forest in the Mascarene archipelago, and still shelters significant biodiversity. Three key ecological parameters have been extracted from the lidar measurements: the canopy height (CH), the forest leaf area index (LAI) and the apparent foliage profile. The mean values of estimated LAI are between ~ 5 and $8 \text{ m}^2/\text{m}^2$ and the mean CH values are $\sim 15 \text{ m}$ for both tropical montane cloud and rain forests. Good agreement is found between Lidar- and MODIS-derived LAI for moderate LAI, but the LAI retrieved from lidar is larger than MODIS on rain forest sites (~ 8 against $\sim 6 \text{ m}^2/\text{m}^2$ from MODIS). Regarding the characterization of tropical biomes, we show that the rain and montane tropical forests can be well distinguished from the planted forests by the use of the three ecological parameters retrieved, as the endemic and exotic forests can also be well distinguished.