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Mobile lidar measurements to investigate the boundary layer and flow regimes over Reunion Island

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Two mobile lidar instruments of new generation were installed on the Reunion Island in the frame of the ECLAIR (Expérience sur la Couche Limite Atmosphérique à l'Ile de la Réunion) field experiment held from 26 November to 5 December 2008. The first one was installed on a pick-up to investigate the structure and temporal evolution of the planetary boundary layer around and inside the island. The second one was located on the site of the University of Reunion Island. This study is a new approach preliminary to the development of an atmospheric observatory, OPAR, located at Piton Maïdo, a high summit (2200m) near the west coast. The field campaign aimed at understanding to what extent, and when, the future observatory will be under the influence of the boundary layer, clouds, and the upward transport of low-level air masses.

Results of lidar observation periods will be presented and discussed in relation to high-resolution model outputs. For instance, the lidar instruments evidence the presence of complex vertical structures of the low troposphere above Reunion Island. Such structures remain even inside the island both in the corries and on the mountains. Moreover, some hydraulic character of the wind trade flow around the island could be highlighted from lidar measurements. Indeed, the Venturi acceleration on each side of the obstacle is accompanied by subsidence and a significant shallowing of the boundary layer along the flow.