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Dynamics of the lahars developed in the Correntoso valley during the eruption of Villarrica volcano in March 3, 2015

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Several lahar pulses developed in the Correntoso valley, NW of Villarricar, during the last strombolian eruption on March 3, 2015. The main goal of this work is to analyze the lahar dynamics, focused in the sedimentological characteristics of the deposit, flow velocity estimation (through superelevation method) and the flow estimation. Based in the particle-size distribution and texture/structure of the deposits we identified proximal and medial phases, both dominated by debris flows with high sediments load (sand to gravel size) that allowed the suspension transport of very large boulders. The grain-size analysis shows uniformity in the matrix throughout the lahar, characterized by a very bad selection and bimodal to polimodal grain distribution. Several lateral and longitudinal variations are a remarkable aspect, closely linked to the morphology and riverbed variations. Based on the stratigraphical record, it is possible to identify at least two flows or pulses. The velocity was calculated in two sites, where the peak flow is four times higher than the deposit. The values obtained correspond to minimal flow velocities, in the range 4.34 to 6.03 m/s. With these data, and three cross-sections within 10 km from the crater, the flow calculated was 177.1 m3/s, 598.5 m3/s y 371 m3/s. Although these flows represent minimal values for the lahar volume, this lahar corresponds to a small magnitude lahar, compared to the oldest lahars at Villarrica volcano.