



## **Calbuco volcano (Southern Chile) Eruption 22-23 April 2015: pyroclastic fall deposits and preliminary petrological study**

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After 54 years since its last major eruption in 1961, Calbuco volcano (Ensenada, Southern Chile) reawakened with few hours of warning on 22 April 2015 at 18:05 local time. The main explosive eruption consisted of two eruption pulses (lasting ~1.5 and ~6 hours each one) on 22 and 23 April, producing stratospheric (>15 km height) eruption columns. The tephra fall affected mainly the area northeast of the volcano and the finest ash was deposited over Southern Chile and Patagonia Argentina. We studied the tephra fall deposits of both pulses in terms of stratigraphy, distribution, volume, emplacement dynamics and eruption source parameters. Here, we show field observations made from 5 to 470 km downwind and we distinguish five layers (Layers A, B, B1, C and D) representing different stages of the eruption evolution. The total calculated bulk tephra fall deposit volume is  $0.27 \pm 0.007$  km<sup>3</sup> (0.11-0.13 km<sup>3</sup> dense rock equivalent). The 38% of it was erupted during the first phase and 62% during the second pulse. This eruption was a magnitude 4.45 event (VEI 4 eruption) of Subplinian type. The erupted materials correspond to a porphyritic basaltic-andesite (54.40-57.2 wt. of % SiO<sub>2</sub>). It produced two types of pumice clasts: high density pumice (HDP), poorly vesiculated and crystal-rich (up to 40 % crystals by volume), and lower density pumice (LDP) characterized by a slightly lower crystallinity and higher vesicle fraction. The textures include phenocrysts in a glassy groundmass with a minor presence of microlites. The mineralogical assemblage of pumices consists of plagioclase (Pl), orthopyroxene (Opx), clinopyroxene (Cpx), Ti-magnetite, and sanidine (Sa) as accessory mineral.