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Volcanic eruptions recorded in the Illimani ice core (Bolivia): 1918–1998 and Tambora periods

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Abstract. Acid layers of volcanic origin detected in polar snow and ice layers are commonly used to document past volcanic activity on a global scale or, conversely, to date polar ice cores. Although most cataclysmic eruptions of the last two centuries (Pinatubo, El Chichon, Agung, Krakatoa, Cosiguina, Tambora, etc.) occurred in the tropics, cold tropical glaciers have not been used for the reconstruction of past volcanism. The glaciochemical study of a 137 m ice core drilled in 1999 close to the summit of Nevado Illimani (Eastern Bolivian Andes, 16°37' S, 67°46' W, 6350 m asl) demonstrates, for the first time, that such eruptions are recorded by both their tropospheric and stratospheric deposits. An 80-year ice sequence (1918-1998) and the Tambora years have been analyzed in detail. In several cases, ash, chloride and fluoride were also detected. The ice records of the Pinatubo (1991), Agung (1963) and Tambora (1815) eruptions are discussed in detail. The potential impact of less important regional eruptions is discussed.

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