

## Evidence of the 1991 Pinatubo volcanic eruption in South Polar snow

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### **Abstract:**

Traces of tephra and increased sulfate ( $\text{SO}_4^{2-}$ ) concentrations were identified in the 1992-1994 snow layers in 2 firn cores from South Pole. The deposition of the Pinatubo  $\text{SO}_4^{2-}$  aerosol was delayed due to the long transport to the high south latitudes and its initial existence at high altitudes in the Antarctic atmosphere. Electron microscopic analyses show that the element composition of the tephra is identical to that of volcanic ash found near the Pinatubo volcano in Philippines. Detailed stratigraphic snow sampling resolved the Pinatubo signal from that of Cerro Hudson eruption during August 1991 in Chile. The South Pole sulfate flux from Pinatubo is calculated to be  $(10.9 \pm 1.1)$  kg  $\text{km}^{-2}$ , while the Hudson sulfate flux is  $(3.2 \pm 1.1)$  kg  $\text{km}^{-2}$ . This information will be useful for estimating the magnitudes of the past volcanic eruptions recorded in Antarctic ice cores.