

## The initial fine ash deposit of the Shikotsu caldera-forming eruption at ca. 45 ka

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We have studied a thin and fine-grained ash deposit that occurs at the bottom of a massive plinian fall unit from Shikotsu caldera, southwest Hokkaido, Japan. This fine ash deposit could be a sign of the initial stage for a catastrophic caldera-forming eruption. The ash is extensively observed at the large number of outcrops for the Shikotsu plinian fall deposit. It is believed that the Shikotsu caldera-forming eruption (SCFE) took place at ca. 42–45 ka.

The lowermost part of the fall unit is divided into two units, A1 and A2. The unit A1 is a well-sorted, thin and fine-grained ash deposit, whereas the unit A2 is constituted by four layers with the alternation of ash and pumice fall deposits. The unit A1 further comprises two sub-layers: the lower layer is a thin (~4 mm thick) and very fine-grained ash layer with sheet-like carbide and the upper one is a crystal rich fine ash layer (~30 mm thick). While the total thickness of A2 is gradually decreasing as far from the source caldera, the thickness of A1 was almost constant everywhere, which extends throughout a distance up to 70 km from the source caldera.

Dry sieve analyses at 0.5 interval between -1 and +4 in  $\phi$  scale were carried out on 8 samples of A1 deposit. The results of grain-size distribution show a bit of change between 1.26 and 2.25 in  $Md \phi$  and between 0.38 and 0.83 in  $\sigma \phi$ . These changes of  $Md \phi$  and  $\sigma \phi$  correspond to distance from 11 km to 70 km, indicating that A1 is quite well sorted and homogeneous grain-sized deposit in its long-distance transportation. These findings suggest that the unit A1 is a well-sorted, widely dispersed and high temperature dilute flow deposit. It seems to be different from the normal pyroclastic surge deposits and may be resulted from a kind of critical mode of eruption just prior to the caldera-forming plinian eruption.

Keywords: Caldera, transport system, eruption dynamics