



Deposition from a volcanic plume under sheared wind condition, origin of double peaked tephra samples.

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The 2011 Grímsvötn eruption started at 17:30 UTC on May the 21st. at around 19:00 UTC the eruption broke through the ice and injected tephra (volcanic ash) into the atmosphere. Peak discharge rate was reached during the first hours of the eruption giving a rise to 20 km high eruption plume. During the first hours of the eruption volcanic tephra was carried from the vent area in two separate directions. The high part of the plume headed towards ESE while the lower part was carried towards SSW by prevailing winds. This caused an unusually wide area (150 km wide at a distance of some 50 km downwind from the volcano) to be affected by the tephra fall. At about 02:00 UTC on the 22nd of May the plume declined and the upper part of the ash cloud was detached from the lower main cloud that continued to carry tephra towards SSW from the volcano. This gave an unexpected opportunity to sample volcanic ash cloud from different levels with accuracy. We shall present some morphological and grain size data from these sample sets and discuss them in the context of the plume and eruption dynamics. Data from the lower part of the plume do show greater variety in grain size and are in general double peaked, while those sampled from the higher part of the plume are more uniform and single peaked. This suggests that commonly observed double peaks in grain size data do represent less focused sampling from different levels of the plume.