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Grain size and shape analysis of the AD 1226 tephra layer, Reykjanes volcanic system

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Recent explosive eruptions in Iceland have drawn attention to long range tephra transport in the atmosphere. In Iceland tephra forming explosion eruptions are frequent, due to abundance of water. However, the volcanism on the island is principally basaltic.
Volcanism along the Reykjanes Peninsula is divided into five distinct volcanic systems. Volcano-tectonic activity within these systems is periodic, with recurrence intervals in the range of 1 ka. Last volcano-tectonic sequence began around AD 940, shortly after settlement of Iceland, and lasted through AD 1340. During this period activity was characterized by basaltic fissure eruptions. Furthermore, this activity period on the Reykjanes peninsula began within the eastern most volcanic system and gradually moved towards the west across the peninsula.
The 1226 eruption was a basaltic fissure eruption with in the Reykjanes volcanic system. The eruption began on land and gradually progressed towards the SW until the volcanic fissure extended into the sea. Water-magma interaction changed the eruption from effusive into explosive forming the largest tephra layer on the peninsula. Due to its close proximity to the Keflavik international airport and that of the capital of Iceland it is important to get an insight into, the characteristics, generation and distribution of such tephra deposits. In this eruption the tephra produced had an approximate volume of 0.1 km3 and covered an area of some 3500 km2 within the 0.5 cm isopach.
Total grain size distribution of this tephra layer will be presented along with analysis of principal grain shapes of the finer portion of the tephra layer as a function of distance from the source. The tephra grain size is dominated by particles finer than 1 millimeter with an almost complete absence of large grains independent of distance from the source.
Comprehensive understanding of the characteristics of tephra generated in this eruption can help us to understand hazards posed by future eruptions of similar nature in the area.