



Laboratory study of volcanic ash electrification

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Electrostatic forces play an important role in the dynamics of volcanic plumes, for example in ash dispersion and aggregation phenomena. Field measurements of ash electrification are often technically challenging due to poor access and there lacks an accepted physical theory to describe the electrical charge exchange which occurs during particle contact. The goal of the study is to investigate single particle electrification under controlled conditions using advanced laboratory facilities. A novel technique is presented, based on the use of a laser based velocimeter. Here an electric field is applied and the field-induced drift velocity of (micron-sized) ash grains is measured as well as the particles fall velocity. This allows the simultaneous determination of a suspended grains size and electrical charge. The experiments are performed in a unique environmental wind tunnel facility under controlled low-pressure conditions. Preliminary results of particle electrification will be presented.