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A bird's-eye view into basaltic explosive activity at Stromboli Volcano, Italy

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In respect to more silicic activity, basaltic explosive activity is characterized by a strong variability of eruptive style on a relatively small spatial and temporal scale. For instance, at Stromboli volcano, small-scale explosions occur at a number of vents, clustered in three areas, each vent often being characterized by a specific explosion style. This low-intensity activity is occasionally interrupted by higher-intensity explosions occurring on a longer time-scale. Defining the key parameters controlling basaltic explosive activity requires detailed information from individual explosions. We present new information about the features of ash-sized tephra from individual explosions of Stromboli. From a safe and favorable location, close to the volcano summit, we fly a remotely-controlled aeromodel into the plume of individual explosions collecting ash samples and, at the same time, airborne video images of the active craters. Sampled ash particles are observed by using a Field Emission SEM equipped with a motorized stage, backscattered electron detector, and EDS, providing morphological, textural, and chemical parameters of the ash particles from the different sources. Images from airborne webcam provides additional, unique information on crater geometry during the sampling activity. Preliminary results show large differences in the surface textures of ash erupted during low- and high-intensity activities, particularly in the type and degree of particle surface alteration.