



Acoustic Array Measurements of Vulcano Jet Eruptions

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ABSTRACT

This paper presents an array measurement on the volcano Stromboli in the area of Sicily in Italy. Eruptions of one of the calderas are characterized by a turbulent jet. So far volcanologists often use seismological equipment, but lately other technologies find their way into the volcanology and were used to describe the state of the volcano. As it is shown by numerical CFD-LES-simulations the distance of the shock-cells of supersonic jets vary with the Mach-number. The sound sources are shown by applying a beamforming algorithm and deconvolution methods (DAMAS2) with synthetic generated microphone data from the simulation. With the knowledge of the main source positions of the jet it is possible to identify the inner pressure beyond the nozzle. This paper presents the experimental setup and preliminary work to lay out the array. As the array setup is very much dependent on the local conditions which are found at the volcano, it is necessary to locate the microphone positions of the array ad-hoc at the caldera. Also first results of the measurements are presented. With further knowledge about the gas composition and the temperature of the jet it is possible to determine the Mach-number of the jet. The main aim of the measurement is to obtain more state information about the volcano.