

Very-Long-Period pulses at Asama Volcano inferred from dense seismic observation

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We observed seismic events composed of a few one-sided velocity pulses with nearly 10s durations (hereafter called VLP pulses) using up to 14 broadband seismometers installed near the summit area of Asama Volcano. Particle motions did not point to a single source location despite their recti-linearities, suggesting a non-isotropic source mechanism. We conducted moment-tensor inversion analysis for these events using the Green's functions consisting of not only the seismometer's response to synthetic translational motions but also the seismometer's response to synthetic tilt motions. The best-fit source locations obtained are deviated to north from the center of crater, with their depth of 100-200m from the crater bottom. Principal value ratios of moment-tensor solutions can be approximated to 5:3:2 which is representative of a combination of tensile-crack and cylinder, with crater dip of 60 deg and with cylinder symmetry axis inclined by 30 deg from vertical. Histogram of tensile-crack strikes for analysed events indicated a bi-modal distribution having peaks near 70 deg and 110 deg, and corresponding source locations slightly but systematically differ between these two groups of events. Time histories of moment-tensors are indicative of initial sudden pressurization and following gradual depressurization at the source region. Considering inflow and outflow of gas generated by a sudden boiling, we try to model the VLP pulses at Asama Volcano.