



## **Magma Emplacement Processes of the Oligocene Zákupy and Miocene Měrunice Diatremes, Czech Republic: Revealed via Petrography, Anisotropy of Magnetic Susceptibility, Paleomagnetic, and Ground Magnetometry Data**

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The emplacement of silica-undersaturated magma in continental rift volcanoes remains poorly understood because the roots of these systems are not often accessible. The Miocene Měrunice and Oligocene Zákupy diatremes, Czech Republic, are located within or on the SE shoulder of the Eger Rift. These diatremes provide a unique opportunity to conduct a comparative emplacement study, in near 3-dimensions, of their sub-volcanic magma plumbing systems. Studies across the rift reveal that magma compositions show a temporal evolution trend that coincides with three rift phases: melilitic-nephelinites during pre-rift (79-49 Ma); two magmas, weakly alkaline olivine basalts and strongly alkaline nephelinite-tephrite-phonolites during syn-rift (42-16 Ma), and olivine foidites during late rift (16-0.3 Ma). Here we report preliminary data on how varying degrees of alkaline magma generation paired with a dynamic rift stress regime yield unique emplacement mechanisms of presumed monogenetic rift diatremes. Field observations and laboratory data at both diatremes indicate multiple emplacement and eruptive events, as shown by variation in eruptive materials and cross cutting relationships between dikes and sills that differ in emplacement dynamics. Anisotropy of magnetic susceptibility (AMS) data were collected from 25 Zákupy diatreme sites and reveal primarily oblate magnetic fabrics that we interpret to indicate that magma flowed up, down, and laterally away from the suspected main conduit. Preliminary paleomagnetic data reveal that the intrusions are of reversed polarity and show some scatter about the expected reverse polarity reference direction that could be related to sub-volcanic deformation of the diatreme. In addition, ground magnetometry data indicate that the main conduit is likely located at the center of the quarry as shown by a magnetic low with a magnetic high radiating around the probable conduit. Curie point estimates show that the magnetic mineral phases carrying the characteristic remanent magnetization are moderate to high titanomagnetite with ilmenite inclusions in clinopyroxene. AMS data from the main feeder dikes from the Měrunice diatreme display a steep upward NW and NE emplacement trend. Petrologic observations indicate that the rocks are olivine basanites with little to no compositional variation between the intrusive and extrusive products. Paleomagnetic data from the Měrunice diatreme are underway and should aid with defining subvolcanic deformation during the growth of the diatreme. The results from this multidisciplinary study suggest that these presumed monogenetic systems display characteristics that are better described by a polygenetic emplacement model.