



## **Spatial and Temporal Evolution of the Rockeskyllerkopf Volcanic Centre, West Eifel Volcanic Field, Germany**

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The Rockeskyllerkopf volcanic center in the Quaternary West Eifel volcanic field, Germany was active between  $474 \pm 39$  ka and  $360 \pm 40$  ka during which time phreatomagmatic to magmatic eruptions occurred sequentially at three distinct centers: SE Lammersdorf (SEL), Rockeskyllerkopf (RKK) and Franzosenbuche (FB). Eruptions at the SEL center were predominantly phreatomagmatic which resulted in deposition of lithic-rich pyroclastic flow deposits with minor juvenile-lapilli dominated, magmatic eruptions in the middle of the sequence. These deposits have their source in an elongate crater to the north east of the present outcrop. The N-S trending RKK center is dominated by lithic-poor, magmatic, coarse grained partially welded deposits with a distinct horizon of fine-grained airfall deposits. The RKK deposits fill a small valley and likely form the main mass of the current topographic high at Rockeskyllerkopf. The deposits of the FB center locally overlie a palaeosol and plant fossil rich horizon that indicate a significant hiatus in eruptive activity prior to this last eruptive phase. The FB deposits are magmatic and comprise an elongate scoria cone with a deep crater that has been filled by airfall deposits and later lava flows.

The geochemical signatures of the lavas at each center are distinct, indicating that the mantle source region is heterogeneous on the scale of 100's of m to 1 km. All the lavas have incompatible trace element characteristics indicative of derivation from depths corresponding to the garnet – spinel transition zone in the presence of hydrous phases: phlogopite in the source of the SEL magma, amphibole in the FB source and both amphibole and phlogopite in the RKK source region.