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Interaction of geothermal and tectonic processes from geodetic studies in the Hengill area, SW Iceland.

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Iceland is the locus of a subaerial rift and a hotspot. Hengill is an active central volcano localized within the volcanic system of the same name, at the triple junction between the North American and Eurasian plates and the Hreppar microplate. Repeated magmatic intrusions into the volcanic system fuel the geothermal systems. The last known intrusion in the occurred between 1993 and 1999. Locally, the high temperature gradient within the crust, the NNE-SSW fissures swarms and the enhanced permeability of fractured volcanic layers support a dynamic circulation of geothermal fluids. Within the volcanic system, two geothermal power plants Nesjavellir, Hellisheiði provide the capital of Iceland, Reykjavík, in heated water and electricity. The extraction and reinjection of geothermal fluids, as well as the tectonic plate movement cause a complex pattern of crustal deformations. We use InSAR and GPS data sets and techniques to infer the surface deformation in the Hengill area between 2009-2017. The temporal and spatial variations of the disparate deformation signals are separated via simple source models. We compare our results to the study of Juncu et al. (2018) on the crustal deformation of the Hengill area between 2012-2015 and reflect on the significance of time range in ground deformation studies.