

Talk preference

Title: Rift - transform fault interactions: A textbook example from Northern Iceland

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Abstract text

Our research aims to contribute to the general understanding of how transform faults and rift systems interact; we mainly based our study on fieldwork, integrated with analogue modelling. The topic of rift-transform interactions can be studied in exceptional detail in North Iceland, where the active transform Husavik-Flatey Fault (HFF) connects with the Gudfinnugja Fault (GF), the latter representing the westernmost structure of the Theistareykir Fissure Swarm (ThFS). Particularly, we studied in the field: *i*) the geometry and kinematics of the faults in the ThFS as well as along the HFF; *ii*) the interactions among all these structures; *iii*) tension fractures opening directions and the amount of opening; *iv*) the dilation in the ThFS.

Our field mapping suggests that the complex fault pattern in the area could be the result of both the HFF prolongation through the whole ThFS and their interaction. In fact, we observed that offsets and strikes of ThFS normal faults change from north to south and this has allowed us to ideally subdivide the ThFS into two areas, limited on either side by the HFF. The eastern portion of the HFF displays major right-stepping segments, marked by both normal and right-lateral strike-slip components and linked by local normal faults.

In addition, tension fracture opening directions in the ThFS are comparable with plate motion directions based on GPS data; nevertheless, several fractures show N90°E opening directions, probably linked with dyke intrusion in the ThFS, at least in Holocene times.

Analogue modelling experiments were performed with the purpose of better understanding the way in which the HFF prolongs beyond the present-day ThFS and how it interacts with it.