The Rapa-Ryysä PGF revisited

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Fault scarps that cross-cut glacial sediments, generally referred as post-glacial faults (PGFs), are distinctive features in northern Fennoscandia (e.g. Kuivamäki *et al.* 1998, Lagerbäck and Sundh 2008). Studies conducted during the past decade have revealed several PGF candidates also in central and south-central Fennoscandia (e.g. Mikko *et al.* 2015, Ojala *et al.* 2019). Two of the candidates, namely Kuhasenmäki in Joutsa and Rapa-Ryysä in Polvijärvi, lie in central Finland (Mäkelä 2018).

New LiDAR DEM (Light Detection and Ranging digital elevation modeling) data has become available northeast of the Rapa-Ryysä PGF. The examination of this data brought forth new discrete segments that clearly belong to the same PGF system. The total length of the Rapa-Ryysä PGF is now 7.6 km (earlier 2.8 km). The system coincides with a bedrock magnetic anomaly (Fig. 1).

The magnitude estimations of palaeo-earthquakes are based on scaling laws that link fault slip values and the lengths of scarps to earthquake magnitudes (Wells and Coppersmith 1994, Leonard 2010). From the perspective of seismic hazard assessment, the system-based moment magnitude estimates yield the most realistic values, as the PGF systems consist of closely associated segments that are most likely linked to the same rupturing event (Ojala *et al.* 2019). Assuming a single rupture event, the moment magnitude of the Rapa-Ryysä earthquake has been around M_W 6.

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Tiivistelmä

Rapa-Ryysän postglasiaalisiirros sai jatkoa

Maanmittauslaitoksen laserkeilaukseen perustuva maaston korkeusmalli (engl. LiDAR DEM) on päivitetty Polvijärven alueelta Pohjois-Karjalassa. Aineistosta paljastuu, että Rapa-Ryysän postglasiaalisiirros jatkuu aikaisemmin esitetystä lähes 5 km koilliseen. Systeemin kokonaispituudeksi tulee noin 7,6 km. Siirros seurailee kallioperän magneettianomaliaa. Rapa-Ryysän siirros on aiheuttanut noin 6 momenttimagnitudin maanjäristyksen syntyessään.

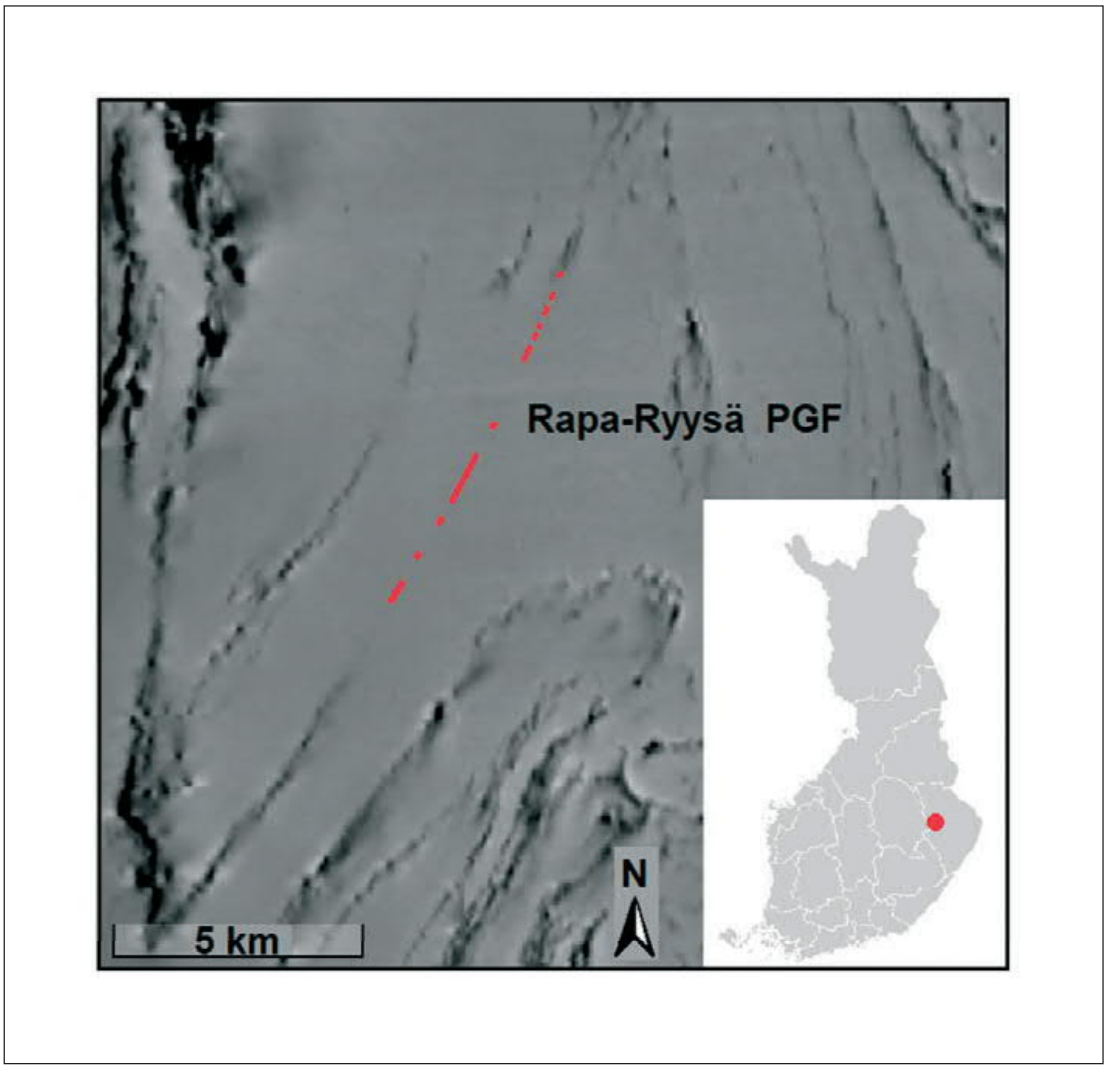

Figure 1. The Rapa-Ryysä PGF candidate on a low-altitude aeromagnetic map (N: 6976036 E: 611464, ETRS-TM35FIN; https://kartta.paikkatietoikkuna.fi/?lang=en).

Kuva 1. Rapa-Ryysän postglasiaalisiirrosehdokas aeromagneettisella matalalentokartalla (P: 6976036 I: 611464, ETRS-TM35FIN; https://kartta.paikkatietoikkuna.fi/?lang=fi).

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