Reviewed research article

The May 29th 2008 earthquake aftershock sequence within the South Iceland Seismic Zone: Fault locations and source parameters of aftershocks

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Abstract — *On May 29th 2008, two M_w ∼6 earthquakes struck the western part of the South Iceland Seismic Zone. The first event was followed within seconds by a similar size event on a second fault ∼5 km further west. Earthquakes, detected by a temporary network of 11 seismometers and three permanent SIL-network stations were located using an automated Coalescence Microseismic Mapping technique. The epicenters delineate two major and several smaller N-S faults as well as an E-W zone of activity stretching further west into the Reykjanes Peninsula Rift Zone. Fault plane solutions show right lateral strike slip mechanisms along the two major N-S faults and suggest both smaller N-S right-lateral strike slip faults further west as well as an E-W zone of left lateral strike slip fault. The aftershocks deepen from 3–5 km in the north to 8–9 km in the south, suggesting that the main faults dip southwards. A brief increase in aftershock seismicity is most likely caused by short-term static stress buildup on adjacent faults. The faulting is interpreted to be driven by the local stress due to transform motion between two parallel segments of the divergent plate boundary crossing Iceland.*