**X-RAY DIFFRACTION DATA**

XRD spectra were collected using a Bruker D8 Advance Powder Diffractometer on powders ground to <60 μm in an agate planetary mill. Phase identification is performed automatically in Bruker’s DIFFRAC.EVA software.

Figure S1: XRD spectrum for Gotugjogv host rock (GOT-i)

Figure S2: XRD spectrum for Gotugjogv damage zone (GOT-xii)

Figure S3: XRD spectrum for Selatrad ultracataclasite (SEL-iii)

Figure S4: XRD spectrum for Gotugjogv zeolite vein (GOT-viii)

**SEM-EDS MINERAL MAPPING**

Chemical composition is mapped using a ZEISS Sigma 300 Field emission – analytical scanning electron microscope with 15 kV acceleration voltage and a beam aperture of 120 μm. We used two Bruker XFlash|60 EDS detectors positioned perpendicular to one another to prevent data shadowing effects. Automated mineralogy classifications were performed using ZEISS Mineralogic software with a 5 micron beam step size and 200 x magnification.

Figure S5: SEM mineral map for Gotugjogv host rock (GOT-i) with relatively unaltered wall rock on the right, and the area between the fractures on the left.

Figure S6: SEM mineral map for Gotugjogv damage zone (GOT-xii), amygdale at bottom right.

Figure S7: SEM mineral map for Gotugjogv brecciated cataclasite (GOT-xi)

Figure S8: SEM mineral map for Selatrad ultracataclasite (SEL-iii)

**UNINTERPRETED FIGURES**

(see paper for captions)

Figure 2

Figure 3

Figure 4

Figure 5

Figure 7

Figure 9

Figure 10

Figure 11

A new digital supplement provides XRD spectra and SEM-EDS mineral maps, as well as uninterpreted versions of the figures.

fig1\_Faroes map\_small.jpg

fig2\_IBO map\_small.jpg

fig3\_GO map\_small.jpg

fig4\_GO litho\_small.jpg

fig5\_SE map\_small.jpg

fig6\_riedel paper.jpg

fig7\_sec faults\_small.jpg

fig8\_fault rock tern\_small.jpg

fig9\_samples\_small.jpg

fig10\_TS scans\_small.jpg

fig11\_microstructures\_small.jpg

fig12\_model\_small.jpg

fig13\_perm&strength\_small.jpg

supp-fig1\_GO13\_small.jpg

supp-fig2\_GO21\_small.jpg

supp-fig3\_SE1\_small.jpg

supp-fig4\_GO23

supp-fig5\_GO13\_minmap

supp-fig6\_GO21\_minmap

supp-fig7\_GO5-B\_minmap

supp-fig8\_SE1\_minmap

fig2\_IBO map\_blank\_small.jpg

fig3\_GO map\_blank\_small.jpg

fig4\_GO litho\_blank\_small.jpg

fig5\_SE map\_blank\_small.jpg

fig7\_sec faults\_blank\_small.jpg

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