

ICDP DSeis 9: are streaks in the M5.5 aftershocks potentially located on highly stressed intrusive?

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ICDP drilling into the aftershock zone of the 2014 M5.5 earthquake near Orkney, South Africa commenced on 2017 and was completed in 2018. Aftershocks located by in-mine 46 geophones are dense at the southern upper fringe, with a sharp cut-off dipping about 20 degrees to the south. Some clear stripes of aftershocks are also seen, in parallel to the upper fringe. It is interesting to note that the reflector (sills) are also in parallel to the upper fringe of the aftershock zone and the aftershock stripes. It is also notable that stress concentration is reported at the intrusives by Sugimura et al. (JpGU2019; ICDP DSeis 5) and Kanematsu et al. (JpGU2019; ICDP DSeis 6). Some mechanism that controls the extent of the aftershocks should exist.

In order to discuss further, we relocated aftershocks with the Double-Difference method (Waldhouser and Ellsworth, 2004). At the moment, we could relocate only 60 events at the upper fringe of the aftershocks. We used in-mine seismic network data of AngloGold Ashanti. P- and S- arrival times that the algorithm of Horiuchi et al. (2011) was used. A sharper alignment of aftershocks is successfully illustrated. By JpGU 2019, we will make additional efforts to extend the area of relocation to discuss more.

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