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Magnetic Imaging of the Geology exposed in the Basement Rocks of the Vredefort Impact crater, South Africa

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Aeromagnetic surveys across the Vredefort crater detect significantly lower magnetic field intensities over the amphibolite-granulite transition exposed in the basement floor of the crater. The reduced field is attributed to shocked Archean granite with high remanent magnetism, and the cause of the anomalies has been linked to the 2.0 Ga impact event. Ground magnetic survey over the amphibolite-granulite transition show that the reduced fields occur in relatively small patches (10 to 100 m diameter) of intensely negative anomalies (Earths field reduced by up to 15000nT, recorded at altitude of 2m above surface). The magnetic fields surrounding these patches are generally close to the Earths ambient field, although there are a few areas were the field is significantly positive. The negative patches do not appear to be confined to any one particular lithology but rather straddle the transition zone. Patches of intensely reduced magnetic fields are also found along impact-related radial faults that transect the basement. We are now working towards explaining these patterns in terms of the local Archean geology and the the impact related shock deformation.