



## **Magnetism in Proterozoic Crust: Rock Properties and Magnetic Response of Amphibolites and Pyroxene Granulites in Southwest Sweden**

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Surface exposures of amphibolites and pyroxene granulites offer opportunities to study the nature of magnetism in rocks that may be representative of the lower crust. Historically such magnetism has been modeled solely with an induced component. This is the correct approach in regions where multidomain magnetite is the dominant magnetic mineral. However, there are regions where the magnetic minerals are dominated by members of the hematite-ilmenite series, which can have both high remanence and high coercivity. Such rocks are abundant, well exposed, and appear to have significant depth extent in southwest Sweden. Many of the mafic granulite rocks from southwest Sweden contain these oxides and there are good surface exposures and a significant depth extent. The Geological Survey of Sweden recently has completed a high-resolution aeromagnetic survey over this area, which can now be interpreted from our extensive collection of samples across the region. Using the magnetic properties of the surface rocks, we address the importance to the aeromagnetic signature of both remanent and induced components. In the mafic rocks remanence is very important and they also have high Koenigsberger ratios. The amphibolites and granulites in southwest Sweden cooled through their blocking temperatures nearly 1 billion years ago. It is important to address how stable the remanence is with time, because the higher the stability, the more coherent the remanent vector will be over the region. By upward continuation of the aeromagnetic data, we can predict what the signature of these rocks would be like, if they were buried deeper in the crust as would be the case for old cratonic crustal regions.