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Synthesis of palaeomagnetic datasets suggests that the geomagnetic field was persistently non-uniformitarian in the Devonian

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The Devonian has long been a problematic era for paleomagnetism. Devonian data are generally difficult to interpret and have complex partial or full overprints. These problems arise from paleomagnetic data obtained from both sedimentary and igneous rocks. As a result, the reconstruction of motions of tectonic plates is often troubling, as these rely on apparent polar wander paths constructed from Devonian paleomagnetic poles. Also the geomagnetic polarity time scale for this time period is poorly constrained. Paleointensity studies suggest that the field was much weaker than the field of today, and it has been hypothesised that this was accompanied by many polarity reversals (a hyperreversing field). We review studies on Devonian paleopoles, magnetostratigraphy and paleointensity. We tentatively suggest that the field during the Devonian might have been so weak and perhaps of a non-dipolar configuration, that obtaining reliable paleomagnetic data from Devonian rocks is extremely difficult. In order to push forward the understanding of the Devonian field, we emphasise the need for studies to provide fully accessible data down to specimen level demagnetisation diagrams. Incorporating all data, no matter how complex or bad they might seem, is the only way to advance the understanding of the Devonian magnetic field. Recent paleointensity studies appear to suggest that the Devonian and Ediacaran were both extreme weak field intervals. For the Ediacaran, it has been hypothesised that the field had an impact on life on earth. A fundamentally weak and perhaps non-dipolar field during the Devonian might have had an influence on evolution and extinctions. As there is a large number of biological crises in the Devonian, we here pose the question whether the Earth's magnetic field was a contributing factor to these crises. New independent evidence from the Devonian-Carboniferous boundary suggests that the Hangenberg event was caused by increased UV-B radiation, which is in line with a weak magnetic field.