Application of various methods for examining the fractal properties of geomagnetic component during quiet and active geomagnetic storm periods

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While it may not be widely recognized, It has been demonstrated by various studies over the years that geomagnetic data exhibits fractal properties. These properties can be utilized to characterize the geomagnetic activity during a particular period using the Hurst exponent. In this study, the geomagnetic activity during several quiet and active geomagnetic storm periods are analyzed using the newly devised method of Robust Detrended Fluctuation Analysis (r-DFA), and also using other three established methods: Power Spectral Analysis (PSA), Rescaled Range Analysis (RRA), and Detrended Fluctuation Analysis (DFA). The results show that there are stark differences between the results produces by each method, with the results of r-DFA surprisingly being the most distinguishable of them all.

