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Palaeomagnetic Study on a 1765 Ma Dyke Swarm from Singhbhum Craton: Implications to the Paleogeographic Position of India

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The paleogeographic position of India within the Columbia supercontinent during Paleoproterozoic era is still uncertain because of very few reliable, high-quality palaeomagnetic data with precise geochronology. Here we are reporting the results of a palaeomagnetic study on precisely dated 1765 Ma WNW-ESE trending dykes (which have an extension of several hundred kilometres) from Singhbhum Craton. Rock magnetic studies, including thermomagnetic curves, and the progressive acquisition of isothermal remanence conducted on selected samples, indicate that the dominant magnetic carrier is magnetite. Incremental alternating field (AF) demagnetization isolated high coercivity components directed to NNW/SSE with shallow inclinations from 10 sampling sites. The primary origin of the ChRM is supported by very high coercivities and unblocking

temperatures of the grains preserving the characteristic remanence, consistency of palaeomagnetic data between sites despite being separated by large distances, lack of any major metamorphic event from the sampling area which might have heated rocks above their blocking temperature, and lack of signs of metamorphism from rock thin sections study. The WNW-ESE trending dykes yield a mean palaeomagnetic direction with a declination = 329.4° and an inclination = -26.6° ($k = 21.5$; $A95 = 10.7^\circ$). The pole position of Singhbhum craton at 1765 Ma is 43.4°N , 308.7°E ($dp=6.3$ and $dm=11.6$). The paleogeographic reconstruction was done, at ca. 1770 Ma, coupled with a correlation of geological features indicate a very clear spatial link between North China Craton and India during Paleoproterozoic.

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