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Long wavelength magnetic anomalies and the occurrence of kimberlites

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The long wavelength magnetic anomalies cover large areas over continents. These anomalies, with the help of Curie temperature (typically around $525 \pm 25\ ^0$C) can be used to derive the thickness of the magnetic crust. Over active continental regions with high heat flow the Curie isotherm lies close to the mid-crustal levels. However over cratons, which represent stable and cool regions, the temperature at the Moho could be in the range of 400-600 ^{0}C. Base of the magnetic crust below the Indian sub-continent derived from harmonic inversion on the scalar MAGSAT anomaly (Mishra,1986) reveals a thin magnetic crust in Cambay basin (a high heat flow region) and along the eastern coast of India (which coincides with the Eastern Ghats Mobile belt). A thick magnetic crust is found under Aravalli, Bastar, Singhbhum and Dharwar regions. It is interesting to note that all these regions lie over the cratons with known clusters of kimberlites. Most of the kimberlite lie at the flanks of the regions showing thick magnetic crust. The study has significant implications in identifying regions with potential for the occurrence of diamonds. It also suggests a possible link between causative sources for kimberlites and regional geomagnetic anomalies.