brought out the hidden long and wide schist belts, which appears to be separating the migmatite gneiss and biotite granite. Geophysical lineaments are inferred depending on the deflections, offsets, terminations and linearity of the contours obtained from the geophysical data. NW-SE, NE-SW & E-W lineaments are inferred from both gravity and magnetic maps including the bounding lineaments of the schist belt (Fig. 2). These lineaments are corroborating with surface inferred faults from the satellite image.

Potential zones of kimberlite pipes obtained by Euler deconvolution method (Vani et al., *in press*) are falling in and around inferred partial domes.

Conclusions

Various inferred structural and morphological features such as faults,

fractures, dykes, domal forms and structures traced from the LISS III images show the complex nature of the surface. Integration of geophysical, geological and remote sensing data brought out the (a) six major faults including fractures (b) Intersections of faults/lineaments & domal structures are likely loci for potential kimberlite zones identified from the Euler deconvolution method of potential field data.

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A Perovskitic Lower Mantle Inferred from High-pressure, High-temperature Sound Velocity Data by Motohiko Murakami, Yasuo Ohishi, Naohisa Hirao and Kei Hirose

The above paper published in *Nature*, v.485, pp.90-94, 03 May 2012, the authors determine the shear-wave velocities for silicate perovskite and ferropericlase under the pressure and temperature conditions of the deep lower mantle using Brillouin scattering spectroscopy. The mineralogical

model that provides the best fit to a global seismic velocity profile indicates that perovskite constitutes more than 93 per cent by volume of the lower mantle, which is a much higher proportion than that predicted by the conventional peridotitic mantle model. It suggests that the lower mantle is

enriched in silicon relative to the upper mantle, which is consistent with the chondritic Earth model. Such chemical stratification implies layered-mantle convection with limited mass transport between the upper and the lower mantle.

Deposition of 1.88-billion-year-old Iron Formations as a Consequence of Rapid Crustal Growth by Birger Rasmussen, Ian R. Fletcher, Andrey Bekker, Janet R. Muhling, Courtney J. Gregory and Alan M. Thorne

The above paper published in *Nature*, v.484, pp.498-501, 26 April 2012 may be of interest to researchers who are involved in the study of iron formations.

Iron formations are chemical sedimentary rocks comprising layers of iron-rich and silica-rich minerals whose deposition requires anoxic and iron-rich (ferruginous) sea water. Their demise after the rise in atmospheric oxygen by 2.32 billion years (Gyr) ago has been attributed to the removal of dissolved iron through progressive oxidation or sulphidation of the deep ocean. Therefore, a sudden return of voluminous iron formations nearly 500 million years later poses an apparent

conundrum. Here the authors date zircons in tuff layers to show that iron formations in the Frere Formation of Western Australia are about 1.88 Gyr old, indicating that the deposition of iron formations from two disparate cratons was coeval and probably reflects global ocean chemistry. The sudden reappearance of major iron formations at 1.88 Gyr ago—contemporaneous with peaks in global mafic-ultramafic magmatism, juvenile continental and oceanic crust formation, mantle depletion and volcanogenic massive sulphide formation—suggests deposition of iron formations as a consequence of major mantle activity and rapid crustal growth. The findings support

the idea that enhanced submarine volcanism and hydrothermal activity linked to a peak in mantle melting released large volumes of ferrous iron and other reductants that overwhelmed the sulphate and oxygen reservoirs of the ocean, decoupling atmospheric and seawater redox states, and causing the return of widespread ferruginous conditions. Iron formations formed on clastic-starved coastal shelves where dissolved iron upwelled and mixed with oxygenated surface water. The disappearance of iron formations after this event may reflect waning mafic-ultramafic magmatism and a diminished flux of hydrothermal iron relative to seawater oxidants.