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\textbf{Carbon and nitrogen signatures of the deep earth from superdeep diamonds} INSERT YOUR ABSTRACT TITLE

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Constraining the carbon and nitrogen isotopic composition of the interior of the earth is vital for understanding the fluxes of these two elements from the earth. The presently accepted bulk δ^{13}C of the earth is -5 ‰ which is very different from the Martian value of -20 ‰ and needs to be investigated (Grady et al., 2004). The δ^{15}N of the deep earth is poorly understood and based on a single study of Kola carbonatites have been proposed to be +3 ‰ (Dauphas and Marty, 1999). This has been attributed to subduction but needs further confirmation.

Data from the deep interior is very scarce due to unavailability of suitable samples. In this context diamonds from Jagersfontein kimberlite are extremely important as they contain majoritic diamonds and metallic inclusions (carbides, oxides and sulphides) that are very rare in natural diamonds (Tappert et al., 2005; Jones, 2008). Such inclusions are indicative of superdeep origin for these diamonds, perhaps from the asthenosphere or the transition zone. We discuss the carbon and nitrogen isotopic composition of these diamonds along with He/Ar ratios which is a good index of magmatic degassing with the aim of constraining the isotopic composition of the deep earth and the subsequent implications for the earth's deep carbon cycle.

For preliminary investigation we performed detailed high precision step heating (combustion) for two (N5 and N6) inclusion bearing diamonds from 400 to 1400?C. By such detailed analysis we are able to decouple trapped component(s) in the samples from contaminants and atmospheric signatures. For N6 (3 mg) containing 327 ppm of nitrogen, we observe a δ^{13}C value of -4.4‰ and δ^{15}N up to 7.1 ‰Ḟor N5 (2.9 mg) with a nitrogen content of 230 ppm, the trapped δ^{13}C is -13.6 ‰ and δ^{15}N is 9.4‰Ȯur preliminary study suggests the possibility of subduction of nitrogen into deep earth. Also, the primordial δ^{13}C of earth may have been comparable to that of Mars. Futher measurements are underway.

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