Deep mantle roots of Zarnitsa pipe.

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Porhyric kimberlite (PK) from Zarnits contains fresh olivine, pyroxene and peridotite xenoliths (harzburgites,dunites with richterite, Phl-Ilm veins, sheared lherzolites, pyroxenites (with amphibole) and eclogites. PK concentrates are rich in pyroxenes and pyropes highest in Cr_2O_3 (to 20%,) Yakutia , plotting to lherzolite, dunite and pyroxenite fields. Compared to kimberlite breccia, minerals from PK are higher in TiO_2. Ilmenite show stepped trend in Cr and Mg-Ti-Cr rich interval for metasomatites. Pyropes REE spectra vary from S type inr dunites to convex up for pyroxenites. Enrichment of garnets in Th, U, Ta, Nb, Zr and lows Pb suggests the interaction with protokimberlites Cr –diopsides have inclined REE and round TRE spectra. REE patterns of the pyroxenites are less inclined. Granulite pyroxenes often have Eu peaks and HFSE. The mantle structure reconstructed with monomineral thermobarometry (Ashchepkov et al., 2017) is similar to Udachnaya with high-T pyroxenite lenses at 2.5-1.0 and 4 -5 GPa. The cold dunite lens is at 5-6 GPa, deformed peridotites are detected deeper. Splitting of P- CaO trend into pyroxenite and dunite rays is noted below 5 GPa. High-T ilmenite- Ti-augite trend rise from the lithosphere base to 3,5 GPa. High-chromium pyropes mainly trace 43-45 mwm-2 to 8 GPa and deeper. Grant: RFBR 16-05-00860 thanks to FASO.