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Composition and structure of mantle lithosphere in the Russian Far East according to xenolths study.

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Lherzolitic mantle xenoliths from the Pliocene – basalts of Russian Primorie referred to the different volcanic regions (plateaus) show spatial -temporal variations of thee mineral chemistry determined for 550 xenoliths and TRE in IGM Novosibirsk but rather similar bulk rock compositions.
In the N Eastern volcanic zone in Sovgavan plateau the xenoliths bearing basalts occur in late stages of the Miocen - Pleocene basalt plateau (Tuttochi), in the late extrusions (necks) and dykes and the post erosion enclosed valley flows (Sunku and Kamky) scoria cones (MountKurgan) where amphiboles occurred in hybrid websterites. In Southern Sikhote Alin in Shkotkov plteau Fe- lherzolites with amphiboles and mica dominate in the basement lavas.
The Pliocene Pogelbanochny neck and lava flow contain y large xenoliths (to 1 m) (Scheka , 1981) sapphires and some other gems (Vysotsky et al ., 2009). The xenolith in the western volcanic zones – Lesozovoskaya, Medvezhy contains kelyphites after garnets and Phl veins
The Cr- diopsides in Tuttochi are more (Na, Al , Ti) depleted and dispersed, in Kamky flow Fe-rich trends is found similar to relation for CPx in Sunku flow and Mount Kurgan. The early stage Nelma and Shkotov palateu Cr-Di show high dispersion and Fe-metasomatism. Mesozoic Anyui Cpx are less Na-Ti-Al riched. The Sp refer to most Al rich OSMA part with are Cr-picotites equilibrated with garnets (16-24% $Cr2O_3$).

Calculated PT geotherms ∼90 mWm-2 everywhere starts near Gar stability at18kabrs. The Western fields show lower mantle thermal gradients. In basaltic plateau P-Fe# trends show percolation trends increasing P-Fe# with Cpx pressure lower then Opx. Those from latest scoria cones demonstrates sub adiabatic PT trajectories (MountKurgan) or Fe# rising to bottom (Medvezhy) formed by melt interaction. The basement plateau Shkotov xenolith reveal first thermal plum impact and subvertical magma channel trend
TRE determined by LAMICP IGM for Sovgavan Cr- diopsides (Sanky-Koppy rivers and Mount Kurgan) show that in lava plateau stage Cpx in spinel facies have LREE Zr, Hf, Nb, Ta depleted patterns common for subduction related mantle melts. The Pliocene post erosion lava xenoliths's CPX reveal humped REE patterns, small depletions in Zr deeper in Ta corresponding to minor garnet in source. Clinopyroxenes from Amph- bearing websteritis are closer in TRE to to melts burn in garnet- bearing lherzolites (HFSE enriched U, Th spidergrams indication carbonatite metasomatism. Cpx in Podgelbanochny xenoliths (Ionov, 1995) reveal LREE - Th, U, Nb, Ta enriched content probably related to carbonatitic metasomatism or melts formed after decomposition of Amph – Phl measomaic association. The small Zr and Pb minima suppose sulfide and minor rutile precipitation.
The host plume of Pliocene basalts are close to derived from primitive mantle source deviating in Sr (peak) small fluctuations in Zr- Hf.
Reconstructed with KD parental liquids for websterites from MountKurgan are close to erupted lavas in La/Ybn . Melts parental for Cr- Di in the xenoliths from Podgelbanochny are more enriched.
The sequence of xenolths show the sequent enrichment of the mantle columns beneath basaltic plateaus with the melts of subduction related to plume source. RBRF grant 11-05-00060.