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Devononian-Carboniferous superplume influence on lithospheric keel of Siberian craton.

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Vast territory of Siberia from Angaria to Anabar and Baltica from Fennoscandia to Archangelsk and Sarmatia was subjected to the superplume. The earlier stages ca 380-360 were characterized by the basalt field activity mainly in rifted regions and later ca 360-350 by the kimberlite field formation. In Siberia in the large territories from Anabar to East Sayan kimberlite pipes are located in separate lines NNE direction. The major part are located in the line from to Alakite and strengthened further to the Biryrusa block (Tumantshet, Muro –Kovinsky fields) and parallel and parallel line from Prilenie to Nakyn and Malo-Botuobinsky field. And another one at the west. Very close time of the kimberlite pipe formation 360-350 ma without high scale migration of Siberia suggest only presence of kimberlite melts simultaneously in the square 2000-3000 km or more across or more accounting Devonian kimberlites in Wyoming (Coopersmith et al., 2003) suggesting spreading plum to Lavrentia.

The structure of the separate kimberlites kimberlite field as it seen from Daldyn and Alakite fields is regular (Ilupin et al., 19986) – the largest pips are location at the elliptic trajectory at the nearly the same distance and in some intermediate points locating at a distance 20-25 km in Alakite and a bit less in Daldyn region. The scattered square with the high concentration of the pipe like in places near Zarnitsa in Daldyn and Sytykanskaya in Alakite field is located in the northern parts of the regions. In

general the pipes are tracing three sub parallel lines. Their crossing with the sub- lateral lineaments are just the locations of the kimberlite fields. In this subrateral lines reconstructed mantle columns are close in composition and general layering what possibly show that the internal structure of mantle lithosphere is built up from the several blocks or less probable due to folding it the base. The structure may be created and described by two models/ Firs suggest the presence of the submelted region beneath the cratonic lithosphere with the regular convection with the cell diameter near 20 km and the large pipes are appearing in the triple junction of the convective cells. The variant of this model is crossing of the meted asthenosphere with the global fracturing crossing the lithosphere. An example of such transferring zones are similar to Cameroon lime in Africa. Another model suppose the rising of the separate blobs of the plume melts which is rotating as a plume heard (Sleep, 1990) described mathematically and experimentally (Dobretsov, Kirdyashkin, 1996) and as variant the crossing of the channels with the transferring zones. The square with the scattered pipes should be the projection of the channel transferring the plume melts at the base of craton.

The largest pips present it each fields are characterized by the same features. They contain statistically more deep seated xenoliths and xenocrysts and Pressure histogram revealing lognormal distributions shifted to the depth near lithosphere base. They contain large amount of pyroxenites located in different levels. The mantle column is more heated and revel several TP trajectories with the most heated corresponding to the Ti enriched associations referring to the influence of protokimberlite melts. They also often reveal the dunite lens near the lithosphere base.

The interaction of the cratonoc lithosphere with the superplume suggest the scheme where the high temperature $>$1600oC ultramafic melts were stopped at the boundary of density inversion ca 85 kbar (Agee , 1998) producing the melting of the carbonated base of mantle lithosphere. After differentiation and interaction the rising protokimberlte melts at the tope were saturated by Ti dissolving the HT metasomatites from the base and intruded lithosphere stopping at the boundaries of layering. They produced the megacrystalline series in the feeder reaching the pyroxene – rich lens near 40 kbar or base of lithosphere. There intrusion produces heating and

hydraulic fracturing and heating and then upwelling of the partly disintegrated crystal mush and metasomatism of surroundings by protokimberlites evolved further to carbonatites in final stages. In favorable TPF conditions growth of the diamonds was accompanied the heating and high temperature alteration with mantle melts mainly in the lower most parts and channel of melt migration.

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