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Does the Siberian superplume come from several episodes of the oceanic crust subducted down to D'' layer during 1 Gyr?

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LATE PRECAMBRIAN – PHANEROZOIC PLUME ACTIVITY in the Siberian craton comprise several episodes at 1270, 360-344, 250, 245-135 Ma. Among them, there are kimberlites and occasional lamproites (the Ingashi River, 1270 Ma), as well as Tunguska flood basalts accompanied with Maimecha alkaline ultramafic rocks and carbonatites at 250 Ma. These rocks are distributed over the entire craton length of ~ 2000 km, showing rejuvenating trend from the southwest to the northeast [Rosen et al., 2007]. Maruyama et al. [2007] and other researchers demonstrated that a single EPISODE MAY COMPRISE THE PULSES: 1 - subduction and eclogitization of the oceanic lithosphere with formation of a megalith in the mantle; 2 - subsidence of megalith to the core-mantle boundary (CMB), its melting with matter of the hot D'' layer, acquiring positive buoyancy, and beginning of uplift as a plume; 3- ascent of plume up to lithosphere or other refractory layer during 1-5 Myr and generation of secondary plume erupting at the Earth's surface as melts [Dobretsov, 2008]. Superplume is assumed to appear when several megaliths enriched some domain on the CMB with eclogite residuals, some individual plumes rise up from there and ambient mantle becomes hotter. The temporal distribution of plume EPISODES IN THE SIBERIAN CRATON may be explained by several pulses as those discussed above (Figs. 1; 2). Oceanic lithosphere subducted beneath the craton during the Mesoproterozoic to Early Paleozoic (closure of the Paleoasian ocean) and in Late Mesozoic up to now (closure of the Tethys and Mongol-Okhotsk ocean). It reached CMB depth at 2900 km during 66 Myr (subduction velocity 6 cm per year, angle of slope 45^{O}, distance 3960km). A question in the title has rather positive answer.

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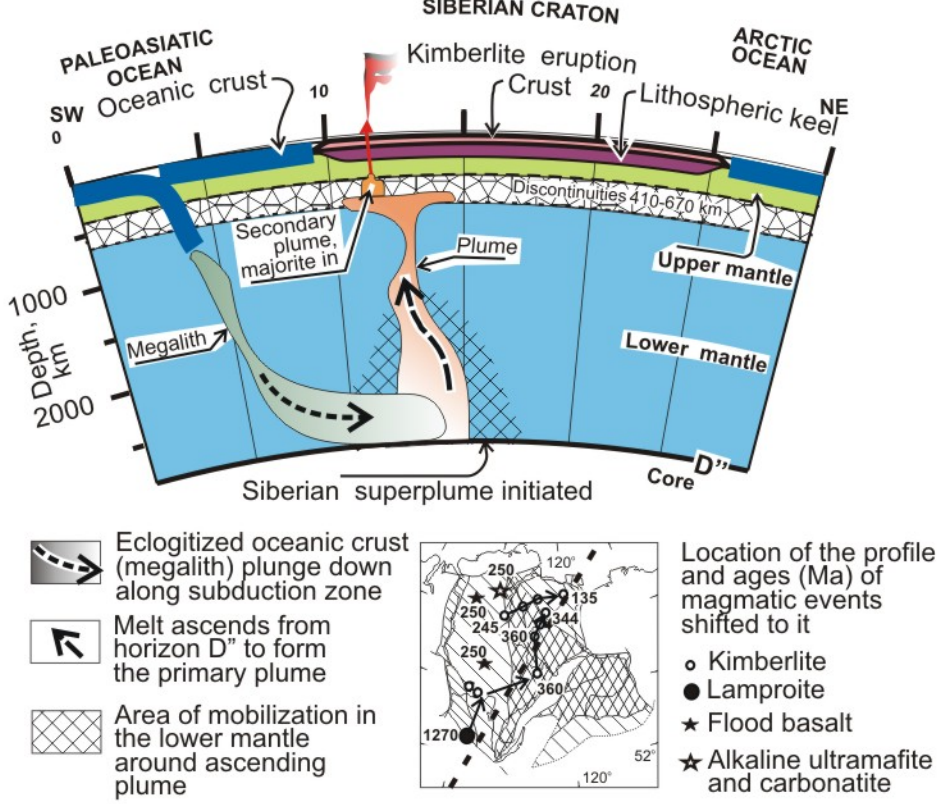

Fig. 1. Diagram for the first appearance of kimberlite magmatism (the Ingashi lamproite, 1268 Ma) supposedly in response to subduction of the Paleoasian oceanic lithosphere beneath the Siberian craton. Model after [Maruyama et al., 2007].

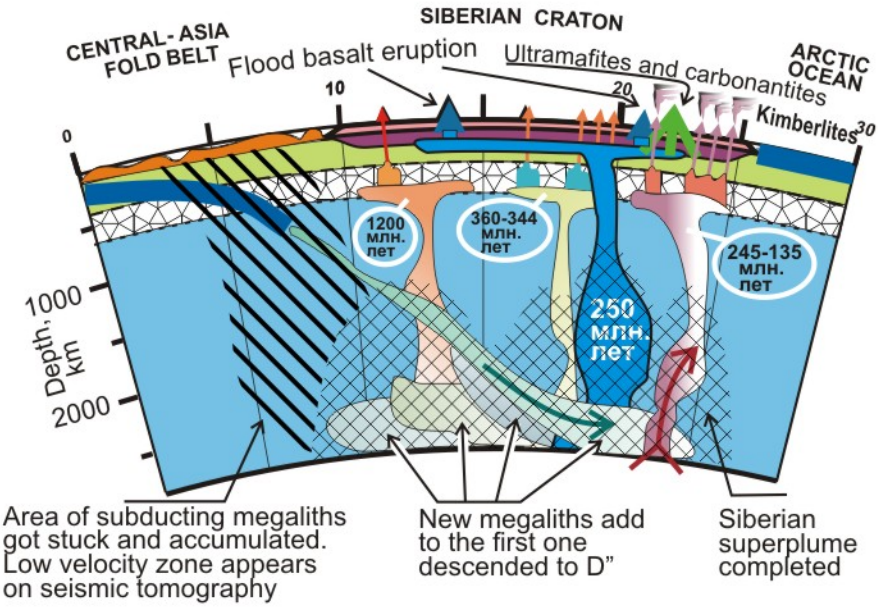

Fig. 2. Scheme of of the Siberian superplume origin through 4 episodes of oceanic lithosphere subduction resulted in the eruption of kimberlite, flood basalt and alkaline-ultramafic rocks with carbonatites associated with eruptions during ~ 1000 Myr.