charnockites (T_{Nd}(DM)=2.7-2.3 Ga, ε_{Nd}(T)= –5.6 to –3.2) suggest derivation of the primary melts from an Archaean crustal source with varying input of juvenile material (Rickers et al., 2001). In contrast, feldspars of enderbites in the northern part have retarded Pb isotopic signatures indicating homogenisation of Pb in Archaean time. These data and Archaean Nd model ages of 3.9-3.0 Ga point to the formation of the igneous protoliths before 3 Ga. Preliminary U-Pb data from zircons with 'granulitic' morphology suggest that enderbites of the northern part experienced high-grade metamorphism at ca. 2.8 Ga.

Pre-Grenvillian metamorphic events have not yet been identified in the lithounits to the east of the WCZ. Therein, the intrusion of enderbites took place at ca. 1.1-1.0 Ga, whereas voluminous megacrystic S-type granitoids were emplaced at ca. 950 Ma (Paul et al., 1990; Kovach et al., 1998). EPMA monazite dating yielded metamorphic ages of 1.16 to 0.91 Ga. Some areas experienced a significant Pan-African thermal overprint at 650-500 Ma (Paul et al., 1990; Kovach et al., 1997; Mezger and Cosca, 1999; Simmat and Raith, 1998).

The results of this study show that the WCZ represents a distinct crustal province that consists of a southern Palaeoproterozoic terrain (1.7-1.6 Ga) and a northern late Archaean terrain (ca. 2.8 Ga). Magmatic and metamorphic events in the southern terrain correlate with 1.7-1.6 Ga events in the south-western United States and Australia (Karlstrom et al., 1999). The northern terrain most likely represents a late Archaean igneous belt at the fringe of the cratonic Bastar nucleus. The WCZ can not be correlated with the Grenvillian units of the EGB and East Antarctica. At the same time available geochronological and Nd isotopic data document that the remaining major part of the EGB and the Rayner Complex and Northern Prince Charles Mountains of East Antarctica were amalgamated during the assembly of Rodinia and remained unified during the breakup of Rodinia and the growth of Gondwana.

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Laurentia-Siberia Connection Revisited Again: An Overview of U-Pb Zircon Geochronology and Nd Isotopes for the Siberian Craton

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Recent paleotectonic reconstructions of Rodinia supercontinent postulate Laurentia-Siberia juxtaposition since Palaeoproterozoic. However, their relative position remains a topic of controversy (Sears and Price, 2000; Hoffman, 1991; Condie and Rosen, 1994; Frost et al., 1998; Rainbird et al., 1998). Sears and Price (2000) connect north-east margin of Siberia to the south-west margin of Laurentia and place Siberia at Australia position in the SWEAT connection. Most of the reconstructions propose continuity of the Palaeoproterozoic Thelon-Taltson magmatic zone of Laurentia and different provinces of Siberia such as the Anabar Shield (Hoffman, 1991), north-east end of the Akitkan belt (Condie and Rosen, 1994), the Aldan and Uchur terranes (Frost et al., 1998) and southwest end of Akitkan belt (Rainbird et al., 1998). These correlations also suppose continuity of Archaean and Palaeoproterozoic provinces of Laurentia and Siberia, i.e., the Wopmay orogen and the Hapchan, Akitkan or Angara belts, or the Slave province and the Batomga, Olekma terranes or the Tungus province.

Available U-Pb geochronological and Nd isotopic data indicate that continental crust of the Siberian Craton (excluding Stanovoy belt) was formed mainly during Archaean (3.1-2.8 Ga) and Palaeoproterozoic (2.4-2.0 Ga) crust-forming events and was reworked during Archaean (3.0 and 2.7-2.6 Ga) and Palaeoproterozoic (2.5-2.4 and 2.0-1.9 Ga) tectono-thermal events. Continental crust of the Stanovoy belt was formed at 3.0-2.8, 2.6-2.5 and 2.0-1.9 Ga. The Aldan Shield and Stanovoy belt collided at ca. 1.93 Ga. Last high-grade metamorphism in the Siberian Craton took place at 1.96-1.92 Ga. Opposite to 2.02-1.91 Ga granitoids of the Thelon-Taltson zone with Archaean Nd model ages (3.0-2.6 Ga), the volcanic rocks of the Akitkan belt yield 1.87-1.82 Ga ages and have Palaeoproterozoic Nd model ages (2.5-2.3 Ga). Intrusions of post-tectonic granites (Sayan, Shumikhin, Udokan complexes) took place at ca. 1.87-1.85 Ga after amalgamation of Siberia by ca. 1.9 Ga. Anorogenic Ulkan complex and Dzhugdzhur anorthosites were formed at 1.74-1.71 Ga. In contrast to Siberia, the continental crust of Northern Laurentia was formed mainly during 2.8-2.6 and 1.9-1.8 Ga events, reworked and assembled by 2.0-1.8 Ga (Hoffman, 1989; Condie, 1990). Significant part of Siberia is composed by 2.4-2.0 Ga continental crust as against the mainly cryptic 2.3-2.1 Ga continental crust of the Wopmay orogen and Cordillera. In present day coordinates Palaeoproterozoic terranes of the Siberia are situated mainly in its eastern and southern parts whereas 2.4-2.0 Ga terranes of the Laurentia are located at the western margin that led to apparent asymmetry in most Laurentia-Siberia reconstruction.

Thus, the current geochronological and Nd isotopic data indicate an asymmetry in the Laurentia-Siberia reconstructions. New lines of investigations are therefore necessary in the poorly known regions of Siberia to bring out the Laurentia-Siberia connection.

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Isotope Structure of Crust and Mantle in the Central Asia Mobile Belt: Geochronological and Isotopic (Nd, Sr and Pb) Data

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Central Asia Mobile Belt (CAMB) separates the Siberian and Sino-Korean-Tarim cratons and stretches for about 5000 km covering a width of 1000-2000 km. The architecture of the CAMB is defined by the combination of Phanerozoic mobile belts and microcontinents. The following isotope provinces have been recognised in the CAMB on the basis of geochronological and Nd isotopic data. "Archaean" (T_{Nd}(DM)=3.3-2.9 Ga) (Baidarik block of the Dzabkhanian microcontinent) and "Paleoproterozoic" (T_{Nd}(DM)=2.6-1.9 Ga) (Baikal-Patom and Barguzin-Vitim terrains, Baidarik block) that were considered as fragments of the old cratons. "Neoproterozoic-I" (T_{Nd}(DM)=1.2-0.6 Ga) formed during opening and closing of rift structures of the Baikal-Muya belt at 1.0-0.8 and 0.7-0.6 Ga. "Neoproterozoic-II" (T_{Nd}(DM)=1.65-1.15 Ga) in the crystalline basement of microcontinents (i.e., Tuvino-Mongolian) formed 800-750 to 540 Ma on the passive margins of Rodinia. "Caledonian" (T_{Nd}(DM)=0.95-0.7 Ga), "Hercynian" (T_{Nd}(DM)=0.75-0.55 Ma) and "Indosinian" (T_{Nd}(DM)=0.3 Ga) that coincide with coeval tectonic zones and formed at 570-475, 420-320 and 310-220 Ma. Precambrian continental crust of microcontinents is underlain by or intermixed with younger "juvenile" crust as expressed through isotopic heterogeneity. Continental crust of the "Caledonian" and "Hercynian" provinces is isotopically homogeneous and was formed from juvenile sources with contribution of old crustal material in the island arcs or active continental margin environments. After collision of the Caledonian, Hercynian and Precambrian structures, young granites were formed from respective continental crust and