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The Lower Cretaceous Giant Dyke Swarms in the Arctic and Its Significance for linking of Siberia-Iceland Hot-Spot Track

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Siberia-Iceland hot-spot track is the one of hot-spot track preserved on continent. Although this hot-spot track has clear plume “heads”- Siberia large igneous province, owing to thick continental lithosphere, its continuing magmatism associated with remaining plume “tail” is unclear compare to other typical hot-spot track occurs in oceanic lithosphere. Overprinted by multi-phase tectonic evolution of the Eurasian basin, the Baffin bay and the north Atlantic ocean in this area makes reconstruction of the hot-spot track more complex.

A landward Lower Cretaceous giant dyke swarm in Arctic area may be a key to discussing those outstanding issues. Herein, geological and isotopic chronology data in giant linear and radiating swarms of Northern Canada, Greenland, Svalbard and Franz Josef Land was collected and analyzed. Combining with aeromagnetic data, primary geometry of those dyke swarms has been solved. After plate (Eurasia plate, North America plate, Greenland plate) reconstruction from 160Ma to 60Ma, a donut-shaped Dyke Swarms on the Southern Alpha Ridge was found.

We propose this donut-shaped Dyke Swarms was the paleo-centre of the Iceland mantle plume during 120-80Ma. Meanwhile, the Northern Alpha ridge and Lomonosov ridge is the result of continental scale

rotational opening of the Amerasia Basin beyond an active mantle plume. The findings provide a key to resolving Siberia - Iceland hot-spot track reconstructions and Amerasia Basin tectonic evolution.

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