

Proterozoic hot-spot events and their influences to crust growth in South China

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According to the study, there were two important hot-spot events during Proterozoic period in South China. The first hot-spot event occurred in the paleo-proterozoic epoch (about 1900-2300 Ma) and was characterized by eruption of komatiitic and komatiitic basalt lavas. The second developed in the Neo-proterozoic epoch (about 1000-900 Ma) and was characterized by accumulation of ophiolites.

Accumulated bodies of two hot-spot events are all lineally distributed in South China continent. Komatiitic lavas have spinifex textures, and the content of MgO is 18-36%; komatiitic basalt lavas also have spinifex textures and MgO is 3-12%. Ophiolites consist of peridotite, lherzolite, gabbroic metamorphic complex, diabass sheet, spilite with pillow structure, plagioclase cordierite and banded chert layers.

Study reveals that these two hot-spot events developing in the paleocontinental margin in South China are due to activity of two different old mantle plumes, and their formational rocks apparently accreted along the continental margin. S wave tomographic plane images reflect that there are two "residual hydrocarbon columns" (residual plume) with the features of relative stable, high velocity, high-resistivity under the lithosphere, for example, one occurs at depths of 350Km and 410Km at 110° E and 26-31° N of the middle South China.

So, activity and migration toward southeast of these two different mantle plumes resulted in the crust growth of South China continent.