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Contrasting mantle-crust melting processes within orogenic belts:  
implications from two episodes of mafic magmatism in the  
western segment of the Neoproterozoic Jiangnan Orogen in  
South China

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**Abstract**

Partial melting of crust and mantle is the dominant mechanism controlling Earth's differentiation. The two melting processes are commonly associated because mantle-derived magmas could simultaneously provide heat and volatiles to promote partial melting of crust. To explore how the two melting regimes interact during the evolution of orogenic belts, we evaluated the petrogenesis and possible relationships with the Rodinia supercontinent of the two episodes of Neoproterozoic mafic magmatism in the western segment of the Jiangnan Orogen in South China. The first episode of mafic magmatism took place at ca. 830 Ma in the Baotan area and was associated with widespread peraluminous granitoids. In contrast, the second formed at ca. 770 Ma in the Longsheng area without significant granitic magmatism. The ca. 770 Ma Longsheng mafic-ultramafic rocks show radiogenic and coupled Nd [ $\epsilon\text{Nd}(t)$  values of  $-1.3$  to  $+3.1$ ] and Hf isotopes [ $\epsilon\text{Hf}(t)$  values of  $+2.6$  to  $+6.7$ ], whereas the ca. 830 Ma Baotan mafic rocks show

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