

长江中下游成矿带及典型矿集区深部结构探测——SinoProbe-03年度进展综述

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中文摘要:大陆现今的地壳结构和物质组成是地壳经历了复杂的动力学演化过程形成的“产品”,保留着演化过程中重大地质事件留下的痕迹,使用现代地球物理探测技术对这个“产品”进行成像,不仅可以了解现今的构造和物质状态,还可以推演过去曾经发生的动力学过程。长江中下游成矿带是我国重要的铁、铜多金属资源基地,其形成的深部动力学过程一直是矿床学家关注、争论的焦点。2010年SinoProbe-03项目在长江中下游成矿带完成了300 km的宽频地震探测,在庐枞矿集区完成了5条剖面累计250 km的反射地震、MT和地球化学剖面测量,经初步处理分析,取得了一系列重要发现,包括成矿带上地幔存在低速体,地幔各向异性呈小尺度变化特征, Moho面存在局部隆起,岩石圈底部界面模糊,地壳呈双层结构,上地壳厚度明显大于下地壳,并且经历了早期强烈挤压、后期伸展的变形过程等。这些新发现支持软流圈上隆、岩石圈减薄,富集地幔熔融、下地壳增厚、拆沉的深部动力学模式,并可解释成矿带普遍发育的白垩纪埃达克岩(adakite)、橄榄玄粗岩(shoshonite)的成因和长江中下游巨型成矿带的形成。

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Probing on Deep Structure of Middle and Lower Reaches of the Yangtze Metallogenic Belt and Typical Ore Concentration Area: A Review of Annual Progress of SinoProbe-03

Abstract:The present crustal structure and composition are “products” of complex geodynamic processes through geological time, which maintains the relics and fabrics formed during the major geological movement. The image of the “products” based on modern geophysical technology can help not only comprehend the current state of the structure and material, but also deduce the geodynamic events occurred in the geological time. The middle and lower reaches of Yangtze River metallogenic belt is an important iron, copper and polymetallic base in China, whose deep dynamic processes have constituted the debate focus among researchers. In 2010, a broadband seismic detection about 300km long has been performed in this belt by SinoProbe-03 project, and five seismic reflection, MT and geochemical profiles totally 250km long have been completed over Lujiang-Zongyang ore concentration area. A couple of significant discoveries were made on the basis of preliminary processing and analysis, such as the existence of low-velocity bodies in the upper mantle of the metallogenic belt, short-distance variations of upper mantle anisotropy, local Moho uplift, blur interface between lithosphere and asthenosphere, double-layer crustal structure with thicker upper crust than lower crust. The reflection pattern of crust indicates that it has experienced early compression and later extensional deformation. These discoveries support the dynamic model of asthenosphere uplift, lithospheric thinning, melting of enriched mantle and lower crust thickening and delamination. With these discovers, the extensive development of Cretaceous adakite, shoshonite in metallogenic belt and the causes for the formation of the giant Yangtze River metallogenic belt can also be explained.


keywords:[Broadband Seismics](#) [Reflection Seismics](#) [Magnetotelluric Tomography](#) [Anisotropy](#) [Receiver function](#) [Crustal structure](#)

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