MT in SINOPROBE Project

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The major goal of the multidisciplinary SINOPROBE project is to better understand the deep structure, dynamics, and evolution of the continental China, with emphasis on geophysical imaging of the lithosphere and the study of its dynamic processes. To this end, as the electromagnetic component of SINOPROBE, broadband (0.01 – 1000s) and long period (1-10,000s) magnetotelluric data were acquired in a series of temporary "standard arrays" deployed across the country. Institutions including China University of Geosciences in Beijing, Wuhan and Institution of Geophysics and Geochemistry Exploration are involved in the array deployments from 2008-2013. On each "standard node" of these arrays, 11 MT sounding sites, including a "central station" with combined broadband and long period instruments, and 10 "auxiliary stations" on the four sides of the central station.

The project itself consists of a nation-wide 4°× 4° framework array and two regional 1°× 1° standard arrays covering the North China and Tibetan Plateau. Data from 989 broad band and long period MT stations in 64 4°× 4° "standard nodes" have been collected, which for the first time enables a synoptic examination of the electrical heterogeneity of crustal and mantle beneath the whole continental China. High quality data from 1380 and 1089 stations are also collected in regional arrays spanning in two approximately regular rectangular areas covering North China and South Tibetan plateau. Together the project has provided an electromagnetic array dataset that covers the continental China with unprecedented density and resolution, which has encouraged many a new insight into the important tectonic and dynamic discussions in China, like the evolution and the formation of North China lithosphere, the expansion mechanism of Tibetan Plateau, and the amalgamation of Cathaysia and Yangtse Blocks, and so on. Here we show an overview of the MT component of SINOPROBE, as well as the recent researches inspired by the project.