Scientific Drilling in Sulu Ultrahigh Pressure Metamorphic Belt

XU Zhiqin and YANG Wencai
(Institute of Geology, CAGS, Beijing, 100037)

The Chinese Continental Scientific Drilling (CCSD) project has been carried out since 1997. A deep scientific hole will be performed within the Dabie-Sulu ultrahigh pressure metamorphic (UHPM) belt that is the largest UHPM belt in the world. So far two pre-pilot holes, together with detailed geophysical surveys, have been completed at Donghai site in the Sulu area, east central China. The holes hit through coesite-bearing eclogite and garnet or spinel peridotite. A relatively large diamond is also discovered in the eclogite around the drilling site. Protoliths of the coesite-bearing eclogite came mainly from supracrust rocks with age about 800 Ma. The garnet peridotite came from continental deficit mantle and underwent high-pressure metamorphism. Isotopic age measurements show that the collision between the Sino-Korean and the Yangtze cratons began at about 240 Ma and the UHP metamorphism about 223 ma (by SHUMP). After the exhumation of the UHP rocks the Yangtze craton was subducted beneath the Sulu UHPM belt and the Sino-Korean craton, inducing post-collisional processes.

A pilot hole of 2000m and a main hole of 5000m will be soon followed to reveal continental deep subduction at the convergent plate boundary, exhumation mechanism of the exhumation of UHP rocks and, recycling and crust-mantle interaction induced by the subduction and exhumation. Integrated studies find some gently dipping thrust slices occurred at depth from 3-4 km, which have high reflectivity, high seismic velocity (6.8 km/s) and high density (3200kg/m^3), probably reflecting unexposed rocks exhumed from deeper mantle.