

Geoscience studies using by AMS at JAEA-AMS-TONO in the Tono Geoscience Center of the Japan Atomic Energy Agency

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The JAEA-AMS-TONO facility was established in 1997 at the Tono Geoscience Center, Japan Atomic Energy Agency (JAEA). Our AMS system is a versatile system based on a 5MV tandem Pelletron type accelerator (National Electrostatic Corporation, US) and has been made available for ¹⁴C-, ¹⁰Be- and ²⁶Al-AMSs. These multi-nuclide AMSs have been mainly applied to neotectonics and hydrogeology, in support of our research on geosphere stability applicable to the long-term isolation of high-level radioactive waste. Furthermore, the ¹⁴C- and ¹⁰Be-AMSs are used for geoscience, environmental science and archaeology by researchers of universities and other institutes under the JAEA's common-use facility program.

Major contribution of radiocarbon (¹⁴C) dating through our ¹⁴C-AMS to geoscience studies are as follows. Yasue *et al.* identified fault displacement and stratigraphic correlation of black soils based on ¹⁴C ages (presented in this conference). They conducted ¹⁴C dating of the black soil collected from a trench wall of the Atera Fault, Gifu. The results of ¹⁴C date show that the soil age varies from 4,000 to 2,000 y with depth of the sampling points and the soil was deposited at approximately constant rate. Imaizumi *et al.* (2006) estimated the faulting age based on ¹⁴C dating of soils at the Senya Fault in the Toen Fault Zone, Yokote Basin, Akita. It was found that the ages range between 1000 - 1300 y, indicating that the Senya Fault was caused by the Rikuu Earthquake in the year of 1896. Sasaki *et al.* (2006) studied local climate change in an inland basin. Pollen records and ¹⁴C ages of sediments in Ohkute Basin, Gifu were used to reconstruct past climate change. The results suggested that the local climate has been warmer for the last 10000 yBP.

Since the fiscal year of 2013, the ¹⁰Be-AMS has been routinely measured and used to study long-term erosion rates of weathered granitic soil surfaces using cosmogenic ¹⁰Be depth profile under the joint research program with the National Institute of Advanced Industrial Science and Technology (AIST). Recently, we have started development of ²⁶Al-AMS. The system tuning and test measurement have been carried out for routine measurement. The development has so far done well and the routine measurements of the ²⁶Al-AMS will be started in near future. The ¹⁰Be- and ²⁶Al-AMSs will be used to estimate the exposure age of basement rocks as well as the sedimentation rate and the assessment of volcanoclastic material ejected during volcanic eruptions.

Keywords: AMS, Dating, C-14, Be-10, Al-26