MALT-AMS：current activity after 30 years history

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MALT (Micro Analysis Laboratory, Tandem accelerator, The University of Tokyo) is an ion beam analysis facility consist of a negative ion source, injection analysis system, a 5MV tandem accelerator, a high energy analysis system, and beam courses each dedicated for ion beam analysis method. Among various beam analysis techniques, AMS (Accelerator Mass Spectrometry) is one of most important. The completion of MALT was in 1993. After the early beam test, the formal operation had started in 1995. Since then, it has been 30 years. This presentation will look back the history of MALT-AMS as well as report current activity.

1. 1995~2000: This is early developing period. Fundamental configuration for ^{10}Be-, ^{14}C-, and ^{26}Al-AMS had been constructed. Application study using meteoric ^{10}Be had started.
2. 2001~2005: ^{14}C-AMS had been mostly used in this period because there had been few AMS facilities available in Japan. We had also contributed to the project of "the propagation of the rice cultivation culture in Japan" conducted by the National Museum of Japanese History. ^{129}I-AMS had been newly developed with the great assistance by the late professor Y. Muramatsu. In this period TCN (in situ CRN) application had been begun for the first time in Japan at MALT.
3. 2006~2010: ^{10}Be in the Antarctic ice core had been eagerly measured for the paleo climate study. ^{36}Cl detection system using a gas filled magnet had been refined and used for the ice core analysis. ^{129}I in many soil samples and spring water samples collected in Japan had been measured. In relation with the dating using ^{129}I/^{127}I system, we questioned the initial ratio believed in those days and measured the deep-sea water in the Indian Ocean.
4. 2011-2015: After the East Japan Earthquake, environmental evaluation study using ^{129}I became the main application at MALT. On the contrary, ^{14}C usage had been decreasing since many ^{14}C dedicated machines were installed in Japan.
5. 2016~2020: Time course variation of ^{129}I in natural archives had been explored, e.g., corals, ice cores and found that ^{129}I was the excellent index for the Anthropocene. ^{10}Be had been continuously measured in various application studies. ^{41}Ca-AMS had been successfully tried. A testbench beamline for the demonstration of the LPD had been constructed.
6. 2021~present: A practical ^{236}U-AMS system had been newly developed by introducing TOF system and applied for the Arctic seawater to investigate the water mass dynamics. A speciation analysis for ^{129}I and ^{127}I in seawater had been successfully conducted.

Currently ^{10}Be-, ^{14}C-, ^{26}Al-, ^{36}Cl-, ^{41}Ca-, ^{129}I-, ^{236}U-AMS are available at MALT and actively used, among which ^{10}Be and ^{129}I are mostly used.