Construction of archiving and sharing system of sample analysis data for future sample return missions

M. Uesugi[1], Y. Karouji[1], Y. Yamamoto[1], H. Tonooka[1], Y. Ishihara[1]
[1]JAXA/ISAS. E-mail: uesugi@planeta.sci.isas.jaxa.jp.

Introduction: Hayabusa spacecraft was returned to the Earth at June 2010, and its sample capsule was successfully recovered at Woomera desert of Australia. Tiny particles less around 100μm were retrieved from two rooms of the sample catcher, and were examined by Hayabusa sample preliminary examination team (HASPET). Silicate materials were confirmed as the regolith particle of asteroid Itokawa, based on their chemical composition and fine structure such as space weathered rims found in their very surfaces. Data of the analyses done by the HASPET was provided to JAXA, and included to the sample catalog for the reference of further detailed investigations. However, the format of the data was arbitrary and was not suitable to use further analyses. Consequently, all data were converted into image files, and embedded into pdf format reports.

Currently, there is no format for archiving sample analysis data. In order to construct data archiving and sharing system for future sample return missions such as Hayabusa2, we started to construct format of sample analysis data. In this paper, we introduce the current status of development of archiving and sharing system, and construction of data format of sample analysis.

Data format: Analysis data can be roughly classified into two types, images and spectra. For example, backscattered electron images by scanning electron microscopes and slice images by tomography are classified into images, and data of energy dispersion spectroscopy and x-ray diffraction are classified into spectra. We first classify all analysis method and instruments into two types, based on the data format of them. Next, we define “raw data” and “final data” for each analysis method based on their type, by discussing with the developer and specialist of the instruments. We can effectively use the “final data” for further investigations, and we can also use “raw data” when a new procedure of the data is developed in future.

Data sharing: In order to share raw data of Hayabusa-returned samples that can be used for further investigations, we are now developing data opening procedure using Data archiving and transfer system (DARTS) managed by C-SODA/JAXA. The structure of the data tree is still under development, and should be modified based on the data format determined by discussions described in the previous section.

Future work: Currently we are working on the determination of sample format. To determine the definitions of “raw data” and “final data” is difficult because several cases are possible depending on the scientific purpose. Those issues should be solved carefully before the construction of detailed systems for archiving.