PUBLICATION OF SELENE DATA COMPLIANT WITH PDS3. Y. Yamamoto[1] and Y. Ishihara[1], [1]Japan Aerospace Exploration Agency/Institute of Space and Astronautical Science (3-1-1, Yoshinodai, Chuo, Sagamihara, Kanagawa 252-5210, JAPAN).

Introduction: The Planetary Data System (PDS) [1] is the de facto standard for archiving data for planetary explorations. The data acquired by the Japanese lunar orbiter SELENE[2] known as Kaguya is currently released from the SELENE Level 2 Database System (L2DB)[3]. The data format is similar to PDS version 3 (PDS3), but it is essentially a different format. Therefore, key applications such as NASAView, GDAL, ISIS can not handle them. From the viewpoint of compliance with PDS3 and application interface, the new SELENE datasets are converted and released.

History: Scientific data should be open to the public so that it can be verified, but there are opinions that it should be released from the space agency that acquired the data. In such a case, there is a possibility that there is no agreement on data archiving with NASA. As a result, for space agencies and projects that do not have an internal review process, it is difficult to prepare PDS compliant data.

The above situation occurred in the SELENE project as well. When the instrument teams created the datasets, they were not familiar with PDS standards. Furthermore, there was no contract between NASA and JAXA to create a PDS3 archive. Therefore, the project has decided to create an archive in its format that closely resembles PDS3. Also, there was no peer review commonly done with PDS. As a result, the datasets looked like PDS3, but the main application could not handle the format, and it contained some mistakes. To improve this situation we decided to convert the SELENE datasets from L2DB datasets to PDS3 compliance datasets, especially PDS3 labels.

PDS compliance level: JAXA defined compliance levels to clarify at what level a dataset are in the preparation status of the PDS. The PDS compliance level is in the followings: (1) Level1: Data format only (2) Level2: Enough documents (3) Level3: Peer-reviewed by PDS nodes (4) Level4: Released from NASA PDS website. In the conversion from L2DB to PDS3, the JAXA's PDS compliance level 1 was aimed. That is, it intended to make the format as accurate as possible.

Important changes: There are significant changes to understand the new SELENE datasets. (1) All PDS3 labels have been switched to detach form. (2) The product of L2DB is the same as the concept of the dataset of PDS3. Therefore, although PRODUCT_ID was the data type of L2DB, the base name of the file name is adopted by this change. (3) The definition of geographic information has been improved. In the datasets with the definition of SAMPLE_PROJECTION_OFFSET, there was a case where the sign was reversed, so it has been fixed. The MAP_SCALE keyword was updated as it did not have enough significant digits for the precision of the data.

Exceptions: We tried to comply with PDS3 as much as possible, but there are some exceptions. There are two reasons for adopting exceptions. One is a specification that became meaningless due to changes in the computer environment which are improved in PDS4. For example, file names and directory names are case sensitive, and file name extensions are not specific ones. The other reason is due to cost constraints. PDS does not recommend storing data in an encoded format, but some data files are compressed with gzip. This is because the data compression rate is high, which contributes to saving storage capacity and network traffic.

Validation method: There are five steps in the validation process. (1) The Validation Tool (VTool) 2.6.0 was first used as a validity check. It is repeated until no more errors and warnings other than length warning. The local dictionary was prepared for keywords that do not exist in the PDS3 standard dictionary. (2) Next, we unified primary keywords and values among the SELENE datasets to keep consistency for a search application. (3) After that, we checked whether the contents of the label was wrong and fixed it. In this process, wrong file size and pointer in the PDS3 label were fixed. (4) The validity check of the application interface was performed. Invalid values for map projection was fixed in this process. (5) Finally, the VTool was used again to check the modified label.

Data release: The new SELENE datasets is released from JAXA's DARTS website[4] on June 1, 2017. In L2DB, data can be retrieved after searching data, but data search and distribution were separated in this conversion. Directly exposed the directory structure by HTTP so that users can see the complete structure of the datasets (http://darts.isas.jaxa.jp/pub/pds3/). Planetary Data Access Protocol (PDAP) developed by International Planetary Data Alliance (IPDA)[5] will be prepared for data search.

References: [1] McMahon S. K. (1996) *Planet. Space Sci., 44,* 3-12. [2] Kato M. et al. (2008) *Adv. Space Res., 42,* 294-300. [3] Okumura H. et al. (2009) *LPS XXXX,* Abstract #1518. [4] Tamura T. et al. (2004) *ADASS XIII*., *314,* 22. [5] Kasaba Y. et al. (2009) *AAS/Div. Planet. Sci. Meeting, 41,* 46.02.