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## Development of a database system of planetary seismology

Ryuhei Yamada<sup>1\*</sup>, Yukio Yamamoto<sup>1</sup>, Jun Kuwamura<sup>2</sup>, Yoshio Nakamura<sup>3</sup>

<sup>1</sup>Japan Aerospace Exploration Agency, <sup>2</sup>Japan PostgreSQL User Group, <sup>3</sup>The University of Texas

From 1969 to 1972, first seismic network except the Earth had been deployed on the Moon in NASA Apollo program. The seismic observation on the Moon has been continued until September, 1977, and the real-time seismic data have been sent to ground-based stations. The observed data was processed and archived in magnetic tapes at NASA Johnson Space Center and The University of Texas Institute for Geophysics (UTIG). Then, the archived data was moved to 8-mm video cassette tapes and computer hard-disk drive for long storage and data analysis by UTIG and Institute of Space and Astronautical Science (ISAS) during 1990's. Currently, these digital-data is archived and opened to the public in NASA National Space Science Data Center (NSSDC) and Incorporated Research Institutions for Seismology (IRIS).

However, since these opened data is archived with original format and the status information of the observation is not archived together, the public users are hard to process the archived data. For the reason, we are developing a new database system to archive all of planetary seismic data with the status information, the characteristics of the seismometers and parts of current results of the data analysis in ISAS. In this database, all digital data is archived with ASCII format, and the users may convert the format to general ones for the seismic study such as SEED, WIN and SAC formats. Our archived data will be opened to Web system, and the users will be able to download the required data using graphical interface on the Web browser. We can compare between the observed waveform and the engineering data of the seismometers in same time series using this interface system.

Our database system includes the active seismic data performed by the astronauts at 1971 and 1972 and the passive listening data observed by the seismometers used for the active seismic experiment from 1976 to 1977, not only the passive seismic data from 1969 to 1977. In these seismic data, many lunar seismic events are included and they are identified and cataloged by (Nakamura, 2008) even now. We are creating a system to search, display and download the required lunar seismic events using information on (Nakamura, 2008). Then, the Martian seismic data observed by the seismometer deployed on Mars from 1976 to 1978 is decoded and archived in our database now to aggregate all of planetary seismic data in our system.

The archived seismic data remain a matter of analysis since their initial analysis. If we use current analysis technique and computer processing ability, we can expect that new important scientific results will be discovered. In addition, we will obtain the useful information for future lunar and Martian seismic experiments by comparing the seismic data with the engineering data and the other geophysical data, which observe the surrounding environment near the seismometers. In this presentation, I will report the overview and current status of the database system and the plan of data analysis using our database.

Keywords: Planetary Seismology, Data Base, Data Archiving, Moonquake, Mars quake, Planetary Seismic Exploration