

1. Introduction

Launched October 18th 1989, the Galileo mission was designed to make long-term investigations of the Jovian system using a spacecraft consisting of a Probe and an Orbiter. The Probe, after being released on the initial approach to Jupiter, entered the Jovian atmosphere and made in-situ measurements. The Probe data were relayed to Earth by the Orbiter. The Orbiter then entered orbit around Jupiter for a 23-month, 10-satellite encounter tour of the Jovian system. The Galileo Europa Mission continued to operate the Orbiter for an additional 24-month, 13-satellite encounter tour, leading into an additional extension. The Galileo Millennium Mission (GMM) continued for an additional 3 years, from January 2000 until January 2003, adding another 9 targeted satellite encounters to the Galileo spacecraft tour.

The objective of the Galileo dust detector system (GDDS) was to investigate the physical and dynamical properties of small dust particles in the Jovian environment. This data set contains information on the dust environment in interplanetary space within the inner solar system and in the Jupiter system, within and without the Jovian magnetosphere, and around the Galilean satellites (Krueger, H. 2010).

2. Archive Contents and History

The GDDS data was archived in PDS in the PDS3 archiving standard from 1996-2010. Table 1 shows the resulting PDS3 GDDS data set that was included in this bundle. The other Galileo instruments' data have been archived at PDS PPI node, in both PDS3 and PDS4, and can be found there.

Table 1. PDS3 GDDS data included in this bundle

Data Description	PDS3 Data Set ID	Date archived	PDS node
Galileo Dust Experiment data	GO_D_GDDS_5_DUST_V4_1	2010-06-02	SBN

During 2025, the PDS3 Galileo Dust Detector System holdings were migrated to the PDS4 archiving standard by the Small Bodies Node. The data files are unchanged. This data set contains the data from the GDDS from start of mission through the end of mission. Included are the dust impact data, noise data, laboratory calibration data, and location and orientation of the spacecraft and instrument.

Document and metadata changes made during the migration of the data sets include:

- No primary data files were modified.
- Metadata in the PDS3 labels were migrated to PDS4 labels.
- All documentation was moved to a new document collection
- A new bundle overview document (the one you are currently reading) was created
- PDS3 data documentation was restructured as needed to reflect the new PDS4 bundle organization.

3. Galileo Dust Detector System Bundle Contents

The Galileo DDS bundle contains a data collection and a document collection.

This **data** collection contains information on the dust environment in interplanetary space within the inner solar system and in the Jupiter system, within and without the Jovian magnetosphere and around the Galilean satellite. The data are presented as tabulated files with detached PDS labels. (See section 4).

The **document** collection contains all of the documentation needed for the GDDS bundle. The *galileo-dds_bundle_overview.pdf*, the *data_collection_description.txt*, the *galdinfo.asc*, the *instrument_description.txt*, and the *references.txt*. (See section 5).

4. The data Collection

This data collection contains information on the dust environment in interplanetary space within the inner solar system and in the Jupiter system, within and without the Jovian magnetosphere and around the Galilean satellites. This information is collected with a dust impact experiment, DDS, from which may be inferred direction of motion, mass, velocity and charge. (See the *instrument_description.txt* file for further information.) The data presented in this dataset include instrumental readouts, inferred metadata, calibration information and a calendar of events. Specifically:

The **galddust.tab** file contains the data received from the dust detector, the spacecraft, and physical properties derived from the detector data for reliable dust impacts (Gruen et al. 1995b, Krueger et al. 1999b, Krueger et al. 2006, and Krueger et al. 2009).

The **galdevnt.tab** file contains the data received from the dust detector, the spacecraft, and physical properties derived from the detector data for reliable dust impacts plus noise events.

The **galdcode.tab** file contains the value ranges corresponding to codes found in galddust.tab.

The **galdcalb.tab** file contains the laboratory calibration data used to relate instrument responses to physical properties of the impacting dust particles.

The **galdarea.tab** file contains the area of the dust detector exposed to particles as a function of their velocity direction relative to the detector axis.

The **galdstat.tab** file contains the time history of Galileo mission and dust detector configuration, tests and other events.

5. The document Collection

The document collection contains 7 documents.

The **galileo-dds_bundle_overview.pdf** document (the document you are reading now).

The **data_collection_description.txt** document provides a description of the GDDS data collection.

The **galdinfo.asc** document contains information for interpreting the code and flag values in the Galileo Dust Detection System (GDDS) data files *galddust.tab* and *galdevnt.tab*.

The **instrument_description.txt** document contains the description of the GDDS instrument.

The **references.txt** document contains the reference list for the bundle.

6. References

Krueger, H., Gruen, E., Baguhl, M., Bindschadler, D., Dermott, S., Divine, N., Fechtig, H., Graps, A., Gustafson, B., Hamilton, D., Hanner, M., Horanyi, M., Kissel, J., Lindblad, B.-A., Linkert, D., Linkert, G., McDonnell, J.A.M., Mann, I., Moissl, R., Morfill, G., Polanskey, C., Schwehm, G., Riemann, R., Siddique, N., Srama, R., Staubach, P., and Zook, H., Galileo Dust Detection System V4.1. GO-D-GDDS-5-DUST-V4.1. NASA Planetary Data System, 2010.

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