



Inside ESPAS – How ESPAS works to let you share and find near-Earth space data

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The ESPAS near-Earth Space Data Infrastructure for e-Science, brings together access to heterogeneous data from ground and space based instruments sensing the Earth's atmosphere, ionosphere, magnetosphere and plasmasphere. The purpose is to encourage the exploitation of multi-instrument, multi-point science data for analysis and to support the development and improvement of models.

Use cases will show how Space Environment scientists can make use of ESPAS to get homogenized access to the ESPAS data repositories. They will demonstrate how search criteria can be flexibly combined to find and retrieve relevant, available datasets no matter where those data are actually hosted. Searches can encompass ground and space based data sets.

The design and implementation of the ESPAS system will be outlined, describing the ESPAS Data Model and the ESPAS Ontology. Further use cases will demonstrate the tools available to data providers in order to conveniently register datasets with ESPAS.

The ESPAS data portal supports finding and retrieving data from many, distributed data providers. Metadata is the key to this ESPAS interoperability and is underpinned by the ESPAS Data Model. To describe data results, such that ESPAS users can find data of interest across diverse data sets, the metadata must answer key questions about how those data results were created, such as: what, where, when, how and who.

The ESPAS Data Model models the data description by defining a series of key concepts to answer such questions. The observation is the key concept at the centre of the ESPAS Data Model, where the observation is the act that results in the estimation of the values of a property (that is the act that results in data). The ESPAS Data Model is built strictly and entirely on ISO 19100 series geographic information standards, particularly the ISO 19156 Observations and Measurements standard.

Consistent metadata in ESPAS is supported by the ESPAS Ontology. This defines a series of vocabularies such as Feature of Interest and Instrument Type to allow data providers to re-use definitions and to make data retrieval consistent and straightforward for data users.

ESPAS uses XML to realise the metadata required for interoperability. Data providers can generate their metadata by using the ESPAS registration tool, a simple, web-form interface. Data users don't need to understand anything about the data model or the underlying XML to use the portal to find and request data. All ESPAS data is available in its native format, as held by the data provider, and some can be extracted as separate parameters and plotted on the fly.