Integration of ESPAS, IUGONET and ISDC: Connection of domain and terminological ontologies

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ESPAS, IUGONET and ISDC are e-infrastructure projects covering the near-earth space domain. The corresponding data management systems provide analogous in-situ and remote measured data from ground- and space-based instruments as well as appropriate context data. An integrated use of this data would strongly enhance the near-earth space science research potential. Different data models and technical realizations hinder the direct interaction of the referred data managements systems. Both the adoption of domain specific data models and the shared use of established terminologies are methods for the connection of data management systems.

A first and promising approach of an integrated use of data is the design and common use of a terminology for the annotation and retrieval of content and context. The draft design of this terminology is based on the SPASE vocabulary modeled as terminological SKOS ontology. The terms of this vocabulary are derived from the "allowed values" of the SPASE data model enhanced by contributions from space physics science teams working with this specific data. Domain specific and cross-domain extensions of the SPASE vocabulary are realized by the merging of GCMD science keywords and GEMET thesaurus. Another focus in this context is the development of a new semantic-web-based ISDC infrastructure and the merging of the ISDC domain ontology with the SPASE vocabulary.

The challenges and lessons learned during the design and integration of geoscience-related domain and terminological ontologies are the related topics of this paper.