We introduce the Solar Terrestrial Observations and Measurements (STOM) Ontology, an extension to the Virtual Solar Terrestrial Observatory (VSTO) Ontology, that introduces a profile of the Observations and Measurements model (ISO 19156) for the solar-terrestrial community. The VSTO Ontology is the semantic backbone of the VSTO portal, enabling semantic discovery of solar terrestrial data products. User feedback on the VSTO Portal has highlighted a community desire for access to observation-level and provenance metadata about terrestrial data products. User feedback on the VSTO Portal has highlighted a community desire for access to observation-level and provenance metadata about terrestrial data products. The STOM Ontology has been designed to allow for the semantic representation of observational metadata and to provide a mechanism to describe data records generated from an observation or derived from other data records. The provenance trace of a published data record to its primary sources may then be encoded using one of several common provenance languages and made available to VSTO Portal users.

Virtual Solar Terrestrial Observatory (VSTO) Ontology 2.0

- Community desire for provenance and observation metadata
- VSTO 2.0 has the following limitations:
  - Does not support record-level objects
  - Can only assert provenance at the dataset-level
  - No support for provenance assertions on a single record or data product item
  - Does not support observations or observational metadata

Results & Next Steps

- The Solar Terrestrial Observations and Measurements (STOM) Ontology aligns concepts from the VSTO v3, O&M, and W3C PROV Ontologies
- Alignment is performed using RDFS subclassOf assertions
- SKOS broadMatch statements
- STOM introduces two new classes

Sponsors:
National Science Foundation

Glossary:
RPI – Rensselaer Polytechnic Institute
TWC – Tetherless World Constellation at Rensselaer Polytechnic Institute
VSTO – Virtual Solar Terrestrial Observatory
O&M – Observation and Measurements

Acknowledgments:
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W3C Provenance Working Group

Observation and Measurements (O&M) Ontology (Draft)
- OWL conversion based on ISO 19150-2 (Draft)
- N.B. hosted in temporary namespace (http://idsegrid.csirouat.auetc)
- When ISO 19150-2 finalized, official version will be hosted in an http://isotc211.org/ namespace
- The final OWL is not expected to vary in any significant way from the draft

Integration with Observation (O&M) and Provenance (W3 PROV-O) Ontologies

- Solution: Develop extension of VSTO aligned with community-backed Observation and Provenance ontologies
- We choose to align with the following ontologies:

W3C Provenance Ontology (PROV-O)
- Developed by W3C Provenance Working Group
- W3C Candidate Recommendation
- http://www.w3.org/TR/prov-o/

Virtual Solar Terrestrial Observatory (VSTO) Ontology 2.0

- Developed initial STOM OWL Ontology
- http://escience.rpi.edu/ontology/infost/stom/1.0/stom
- Current mappings subject to change
- STOM provides support for provenance and observation-centric metadata
- Next Steps
  - Develop new VSTO Portal Use Cases
  - Incorporate STOM in future non-VSTO Portal Systems

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