Implementing the HDF-EOS5 software library for data products in the UNAVCO InSAR archive

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UNAVCO is a non-profit university-governed consortium that operates the U.S. National Science Foundation (NSF) Geodesy Advancing Geosciences and EarthScope (GAGE) facility and provides operational support to the Western North America InSAR Consortium (WInSAR). The seamless synthetic aperture radar archive (SSARA) is a seamless distributed access system for SAR data and higher-level data products. Under the NASA-funded SSARA project, a user-contributed InSAR archive for interferograms, time series, and other derived data products was developed at UNAVCO. The InSAR archive development has led to the adoption of the HDF-EOS5 data model, file format, and library. The HDF-EOS software library was designed to support NASA Earth Observation System (EOS) science data products and provides data structures for radar geometry (Swath) and geocoded (Grid) data based on the HDF5 data model and file format provided by the HDF Group. HDF-EOS5 inherits the benefits of HDF5 (open-source software support, internal compression, portability, support for structural data, self-describing file metadata enhanced performance, and xml support) and provides a way to standardize InSAR data products. Instrument- and datatype-independent services, such as subsetting, can be applied to files across a wide variety of data products through the same library interface. The library allows integration with GIS software packages such as ArcGIS and GDAL, conversion to other data formats like NetCDF and GeoTIFF, and is extensible with new data structures to support future requirements. UNAVCO maintains a GitHub repository that provides example software for creating data products from popular InSAR processing software packages like GMT5SAR and ISCE as well as examples for reading and converting the data products into other formats. Digital object identifiers (DOI) have been incorporated into the InSAR archive allowing users to assign a permanent location for their processed result and easily reference the final data products. A metadata attribute is added to the HDF-EOS5 file when a DOI is minted for a data product. These data products are searchable through the SSARA federated query providing access to processed data for both expert and non-expert InSAR users. The archive facilitates timely distribution of processed data with particular importance for geohazards and event response.