



An Emerging Standard for Accessing Time Series Data: The Heliophysics Application Programmers Interface (HAPI)

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We introduce the Heliophysics Application Programmers Interface (HAPI), which is a newly developed specification for delivering digital time series data. HAPI was inspired by the similarity of existing data delivery systems at multiple NASA data centers that deal with particle, field and plasma data. A group of multiple institutions has worked together to capture best practices and define a standard representing the essential, lowest common denominator for basic data access to time series data products.

A HAPI server offers three primary services: 1. listing the ids of available datasets (one unique id per dataset), 2. providing basic metadata for each dataset (JSON format), and 3. streaming numerical content for any dataset. The HAPI specification defines the input format for user requests and the response format by the server. The metadata requirements are minimal and can likely be adapted from existing metadata sources. Servers must support outgoing data streams of Comma Separated Values (CSV) format, and two other optional formats are also allowed, namely JSON and binary, both of which are close analogs of the CSV stream.

The most recent version of the HAPI specification is online at Github: <https://hapi-server.github.io>

The development of example servers and clients in multiple languages: (IDL, Python, Matlab, and Java) is also underway and links to these projects are available at the Github site. The institutions adopting HAPI include Goddard (CDAWeb for data and CCMC for models), LASP at the University of Colorado Boulder, the Particles and Plasma Interactions node of the Planetary Data System (PPI/PDS) at UCLA, the Plasma Wave Group at the University of Iowa, the Space Sector at the Johns Hopkins Applied Physics Lab (APL), and the timeseries.org site maintained at George Mason University. As these institutions adopt HAPI over the next year, the proliferation of standardized low-level access infrastructure is expected to enhance the interoperability needed for multi-mission and multi-instrument data analysis. For news and updates, subscribe to hapi-news@hapi-server.org.