OPUS: Now with Enhanced Geometric Metadata for Cassini Optical Remote Sensing Instruments. M. K.
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Introduction: The PDS Rings Node recently re-
leased a completely revamped user interface for our
search tool, the Outer Planets Unified Search (OPUS).
It is faster and enables even more powerful search ca-
pabilities than the previous version. Although OPUS is
a Rings Node tool, it supports all of the data in a da-
taset, not just the ring observations.

Feature of Note: Enhanced Metadata. We have
developed and incorporated into OPUS, detailed geo-
metric metadata about Saturn and its rings and satel-
lites. OPUS now supports with enhanced metadata
Cassini ISS, VIMS, and UVIS data sets. CIRS data sets
will be supported later this year. Geometric metadata is
generated for each Cassini quarterly delivery and is
based on the most current SPICE kernels available.

This extensive set of geometric metadata is unique
to the Rings Node and enables search constraints such
as latitudes and longitudes (Saturn, Titan, icy satellites,
and rings), viewing and illumination geometry (phase,
incidence and emission angles), ring open angles (to
observer and to the sun), and distances and resolution.
Unique parameters include the effective ring radial
resolution − the radial resolution in km/pixel as pro-
jected onto the ring plane. This distinction is important
because the rings can be highly foreshortened, in which
case the actual resolution in the ring plane is much
coarser than the standard resolution would indicate.
Analogous information about the effective, foreshort-
ened resolution on planetary surfaces is also provided.
We also provide metadata to support an additional co-
ordinate frame used to describe the geometry of nearly
edge-on views of the rings. The database also includes
identification of all rings and bodies in the field of
view of each observation, not just the intended target.

**Feature of Note: Support for HST planetary
Observations.** OPUS currently supports observations
made using one of three Hubble Space Telescope
(HST) instruments: ACS, WPC3, and WFPC2. We
regularly access the archive of the HST, the "Mikulski
Archive for Space Telescopes" (MAST), identify the
planetary observations made by the HST instruments
we support, and extract metadata and support files for
each of those observations. We then generate PDS data
volumes organized by observing proposal. These are
entered into the OPUS database. These are nearly
complete datasets, including browse products, but in-
terestingly, not the actual data. MAST provides on-the-
fly calibrated versions of their data, so we provide the
relevant information necessary to obtain the calibrated

data product from MAST. The key here is that for the
supported instruments, planetary scientists can now
search the HST archive using a search tool designed
for planetary data.

We are currently developing a new pipeline in or-
der to add the STIS instrument to the list of supported
HST instruments. Through a recently awarded external
grant, over the next three years we will expand our
MAST interface in order to add support for all HST
instruments including the generation of enhanced geo-
metric metadata for every product.

OPUS: http://tools.pds-rings.seti.org/opus/
Rings Node: http://pds-rings.seti.org/