# 1. SSAP getData – or Datalink?

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- The SSAP usecase
- Parameters, and their syntax
- Communicating generation parameters

# 2. Why getData?

Primary usecase: Cutouts. For spectra, that's particularly useful since people frequently are interested in just the vicinity of a spectral line.

Secondary usecase: Generation of spectra in diverse formats. SSAP already has a `FORMAT` parameter; if a service supports generating lots of formats (e.g., VOTable, SDM FITS, "FITS image"), the SSAP response will contain a row each for every format and every object, which may be clunky depending on the smarts of the client; deferring the FORMAT decision to retrieval remedies that.

With cutouts, continuum subtraction, rebinning, and similar become difficult in the client. Thus, it may become necessary to put this on the server side, too.

# 3. getData: The principle

Idea: Rather than use what's returned as accref, use the publisher DID on `getData`.

`getData` without a PUBDID would return a metadata response.

Possible addition: Allow creator DID as well? This would potentially allow the discovery of a uniquely identified spectrum; however, since right now it seems nobody actually passes around creator DIDs, it's probably not worth the effort.

Unknown PUBDIDs yield a 404.

`getData` may evaluate further parameters, locally defined ones and parameters like `FORMAT` (on-the-fly format conversion), `BAND` (cutouts), `SPECRP` (rebinning), and `FLUXCALIB` (flux normalization).

`getData` must error out on unknown parameters or malformed parameter values.

# 4. PQL metacharacters

SSAP vaguely defines metacharacters for parameters: `7e-7/8e-7,1e-10/2e-10;RESTFRAME` might be a valid specification for `BAND`.

I propose to not recognize any of this and just define a special syntax for BAND: `[<low>]/[<high>]`.

Personal preference: I'd much rather have, say, `LAMBDA_LOW` and `LAMBDA_HIGH` and punt the parameter syntax entirely, but that's probably too far from SSAP.

Completely unhandled right now: transformation to rest frame. This may not be so bad for the primary use case of querying specific lines on specific objects since the object's redshift would usually be known to the client (or its user).

# 5. Generation Parameters

To declare support of getData, services include a TABLE named `generationParameters` in the SSAP `queryData` response (a copy of this table is returned when no PUBDID is given in getData):

```
<TABLE name="generationParameters">
  <PARAM name="FORMAT" datatype="char" arraysize="*"
    value="application/x-votable+xml">
    <VALUES>
      <OPTION>application/x-votable+xml</OPTION>
      <OPTION>text/plain</OPTION>
      <OPTION>application/fits</OPTION>
    </VALUES>
  </PARAM>
  <PARAM name="BAND" datatype="float" unit="m">
    <VALUES>
      <MIN>2e-7</MIN>
      <MAX>8e-7</MAX>
    </VALUES>
  </PARAM>
</TABLE>
```

Basically, there are enumerated parameters (probably all string-valued parameters are enumerated), and ranged parameters (probably all floating-point valued parameters). The VALUES children allow clients to figure out what values *might* yield a spectrum in from getData request. The service is still free to return a 400 with a standard SSAP error document if getData parameters are not palatable or come in an invalid combination.

# 6. A preliminary spec

As a part of SSAP evolution, we are proposing this and two additional features for object name querying. See

http://docs.g-vo.org/ssaevolution.html

If you have more ideas that should go into SSAP evolution, you're welcome to participate.