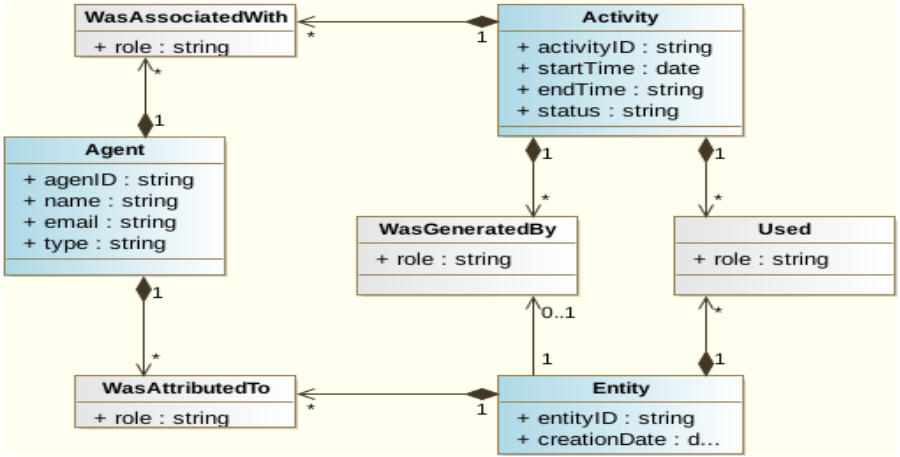
ProvSAP prototypes

Michèle Sanguillon
Kristin Riebe
Provenance Working Group

Provenance Group

Data Model (proposed recommandation)

Core classes



Access Protocols (drafts)

- **ProvSAP:** retrieve provenance information of one or several items (entity, activity)

3 implementations: Pollux database, RAVE experiment & MuseWise

- **ProvTAP:** discovery of datasets based on provenance criteria

Cf F. Bonnarel's talk – ADASS

ProvSAP draft

- Why ProvSAP?
  - Allows users to retrieve serializations for a given item
  - Offers W3C compatible serializations that can be processed by tools that understand W3C provenance metadata
  - For existing projects with their own provenance data structure, gives the opportunity to share the provenance data in a common serialization format with other tools
  - Returns valid IVOA or W3C serializations, which can be processed or uploaded with other tools, or also placed into FITS-headers
  - Easy to implement: by a Web service (GET request)
- Draft : need to be updated (ProvenanceDM last version: model and serialization)

ProvSAP parameters

	Parameter	Values	Description
Mandatory	**ID**	qualified ID	a valid qualified identifier for an entity, activity or agent (can occur multiple times)
	DEPTH	0,1,2,..., ALL	number of relations to be followed or ALL for everything, independent of the relation type
	RESPONSEFORMAT	PROV-N, PROV-JSON, PROV-XML, PROV-VOTABLE	serialisation format of the response
Optional	DIRECTION	BACK, FORTH	BACK = track the provenance history, FORTH = explore the results of activities and where entities have been used
	MEMBERS	true (1) or false (0)	if true/1, retrieve and track members of collections
	STEPS	true (1) or false (0)	if true/1, retrieve and track steps of activityFlows
	AGENT	true (1) or false (0)	if true/1, explore all relations for agents, i.e. find out what an agent is responsible for
	MODEL	IVOA or W3C	compatibility of the serialization to the IVOA or W3C provenance data model

ID: ongoing discussion.
Do we have to restrict to IDs of entities?

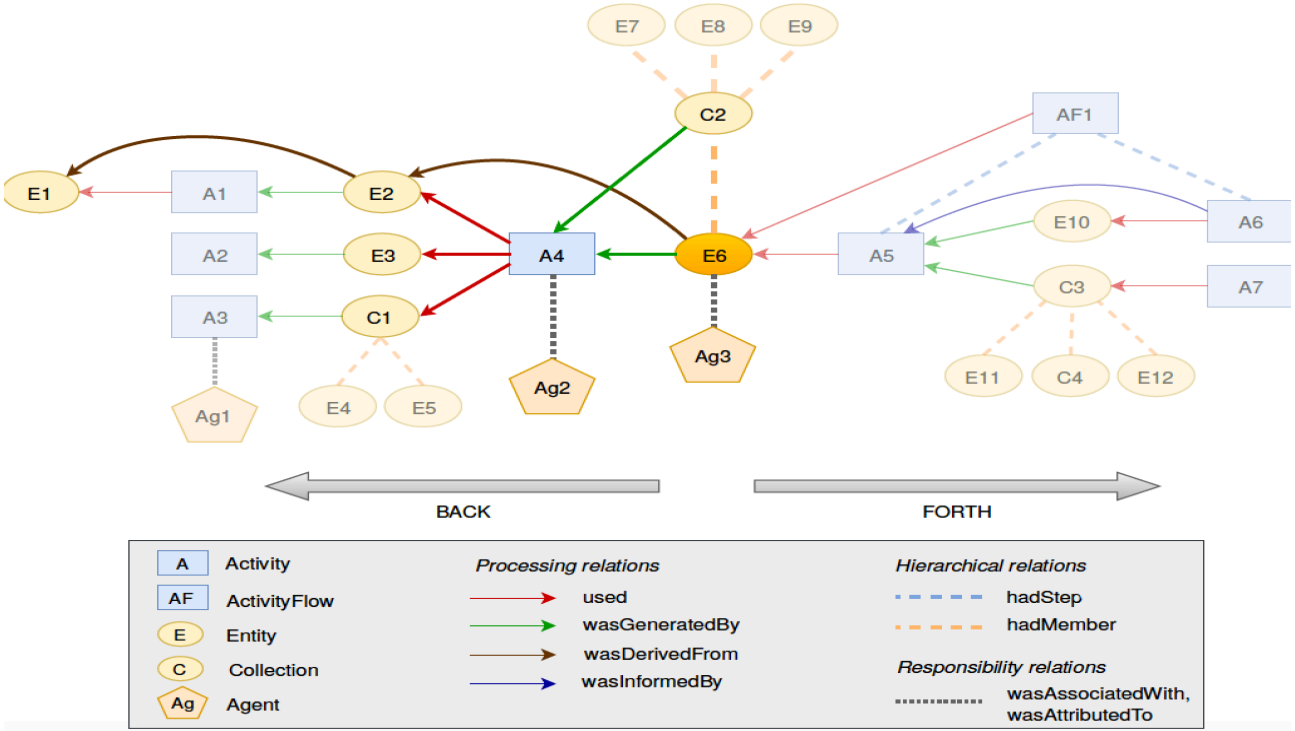
DEPTH: Last discussions:
1 = 1 processing step

~~STEPS:~~ no workflow in the DM 1.0

AGENT: Last discussions: won't track further => display or not agents

MODEL: ongoing discussion. Only W3C or IVOA serialzation? If IVOA, other parameters?

ProvSAP draft

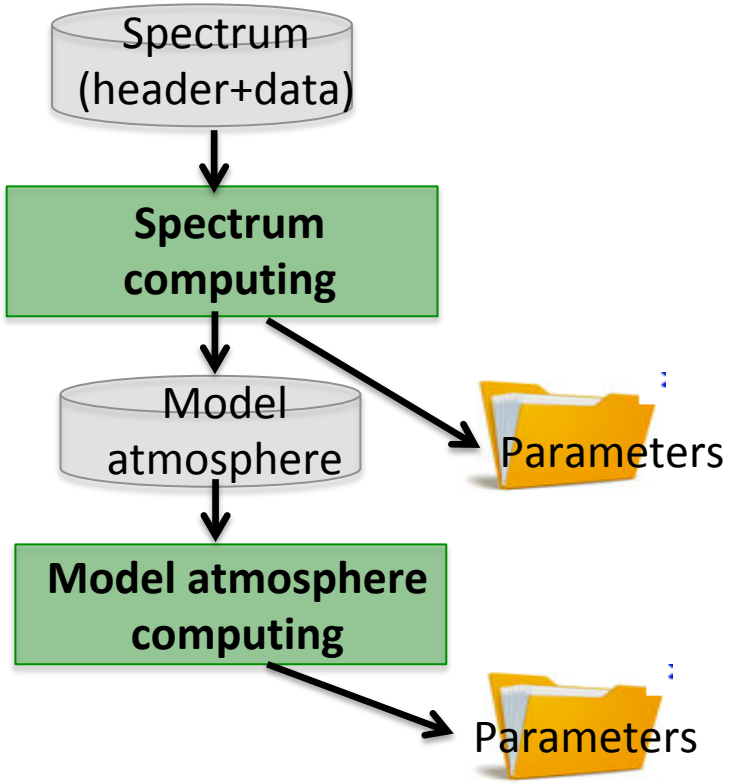


The context of Pollux

- **Pollux: Synthetic stellar spectra database**
- Access via a website (http://pollux.oreme.org) or via the SSA protocol (ivo://ov-gso/ssap/pollux)
- Spectra computed at very high resolution (computing done by the producers and not on the fly)
- Spectra provided in different formats (Flat tables, FITS, VOTable, …)
- Has its own provenance data structure provided in a header file or in a specific HDU in FITS files
- Wish to provide provenance information in a standardized format

=> Implementation of ProvSAP

Pollux spectra history



Only the spectra are hosted at LUPM and available on the VO

⇒ We decide

to provide only the provenance of the spectra

Implemention of the parameters

Parameter	Values	Description
ID	qualified ID	a valid qualified identifier for an entity, activity or agent (can occur multiple times)
DEPTH	0,1,2,..., ALL	number of relations to be followed or ALL for everything, independent of the relation type
RESPONSEFORMAT	PROV-N, PROV-JSON, PROV-XML, PROV-VOTABLE	serialisation format of the response
DIRECTION	BACK, FORTH	BACK = track the provenance history, FORTH = explore the results of activities and where entities have been used
MEMBERS	true (1) or false (0)	if true/1, retrieve and track members of collections
STEPS	true (1) or false (0)	if true/1, retrieve and track steps of activityFlows
AGENT	true (1) or false (0)	if true/1, explore all relations for agents, i.e. find out what an agent is responsible for
MODEL	IVOA or W3C	compatibility of the serialization to the IVOA or W3C provenance data model

ID: Multiple Ids spectra ids only

DEPTH: 0,1,…,ALL

RESPONSEFORMAT: PROV-N, PROV-JSON, PROV-XML, PROV-VOTABLE, **SVG, PNG, PDF**

DIRECTION: BACK only

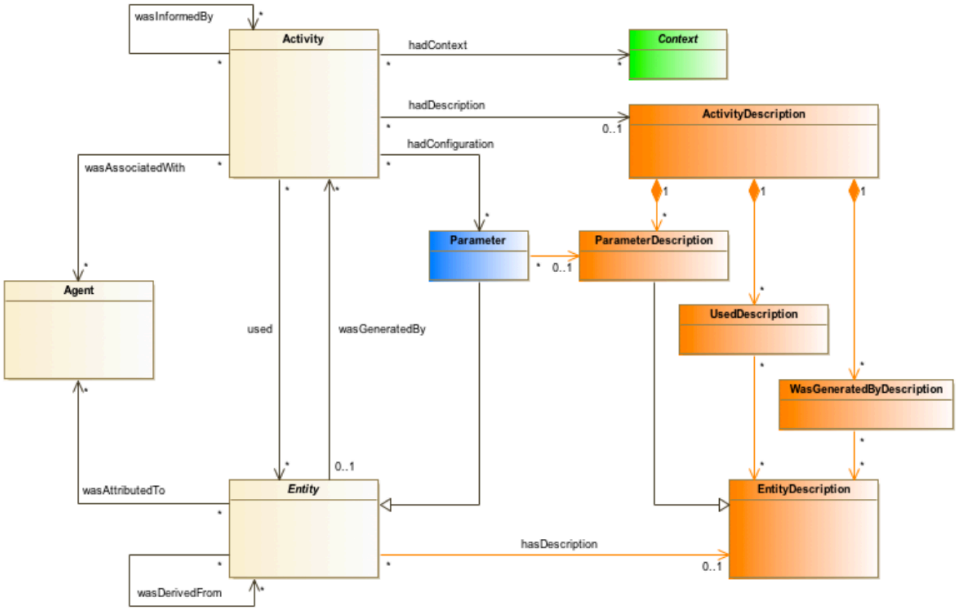
MEMBERS: no coll defined

STEPS: no workflow defined

AGENT: true or false (to display or not)

MODEL: W3C, IVOA in progress

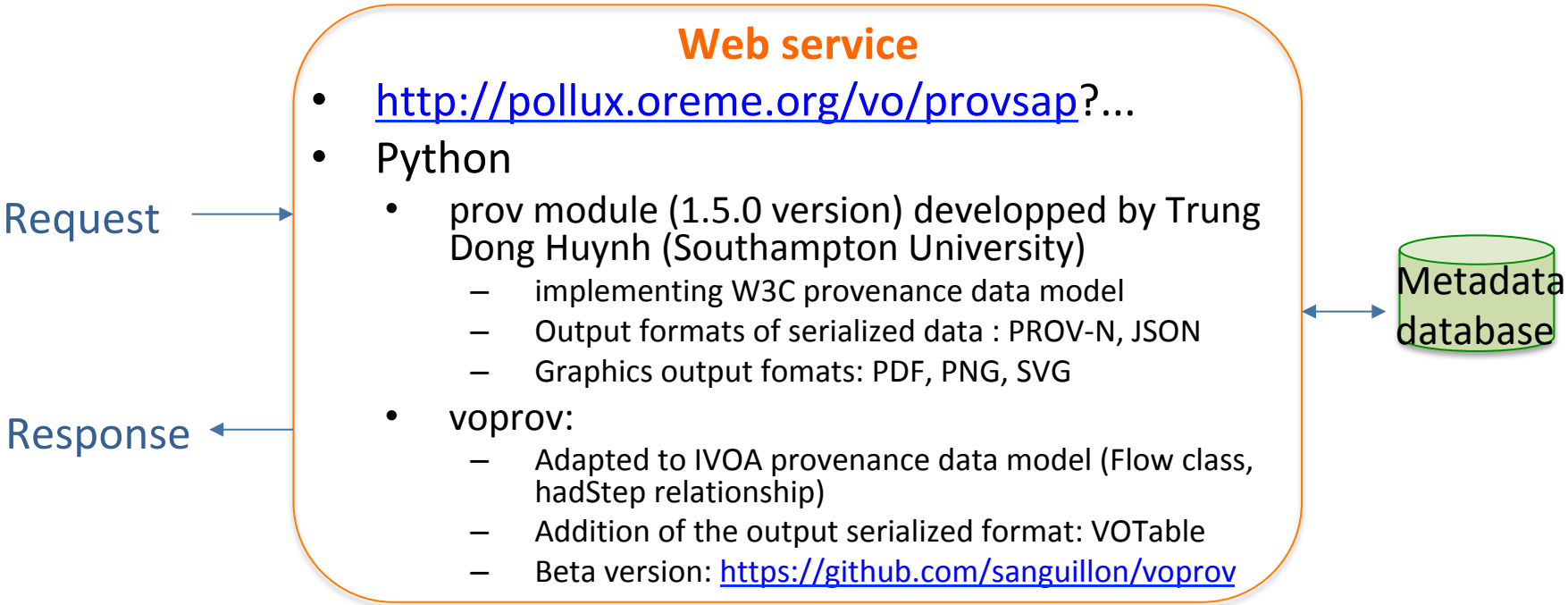
Mapping IVOA-W3C used



Non W3C classes:
- mapped to entities
- prov:type=voprov:<class_name>

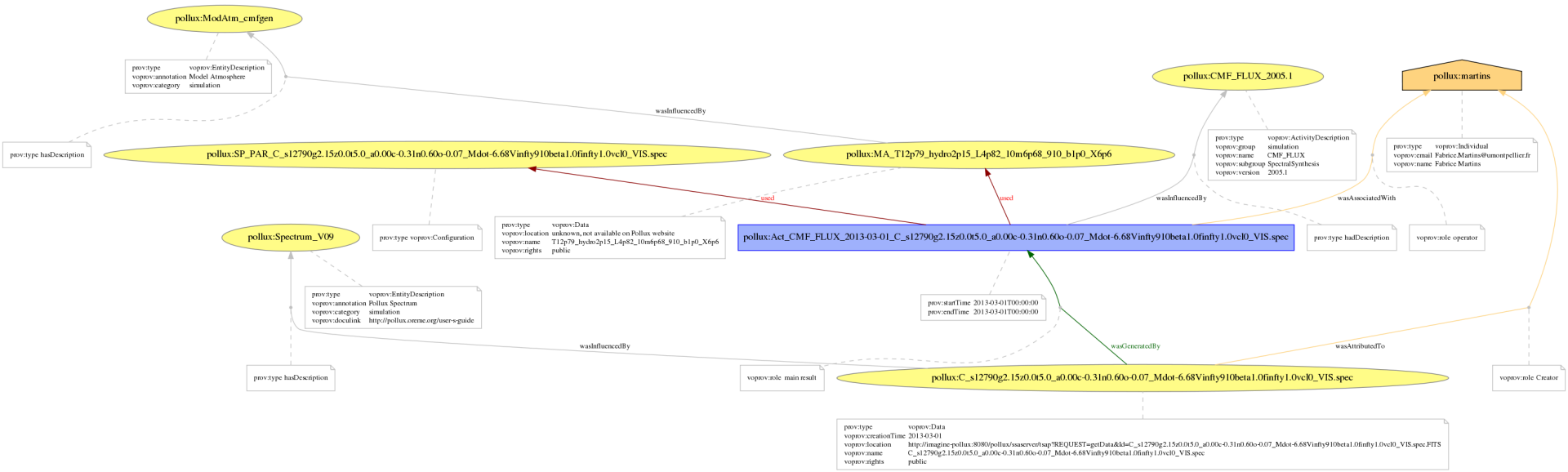
Non W3C relations:
- mapped to wasInfluencedBy
- prov:type=voprov:<relation_name>

ProvSAP Web service



ProvSAP query

http://pollux.oreme.org/vo/provsap?id=C_s12790g2.15z0.0t5.0_a0.00c-0.31n0.60o-0.07_Mdot-6.68Vinfty910beta1.0finfty1.0vcl0_VIS.spec.FITS&RESPONSEFORMAT=PNG&DEPTH=1&AGENT=true&model=W3C

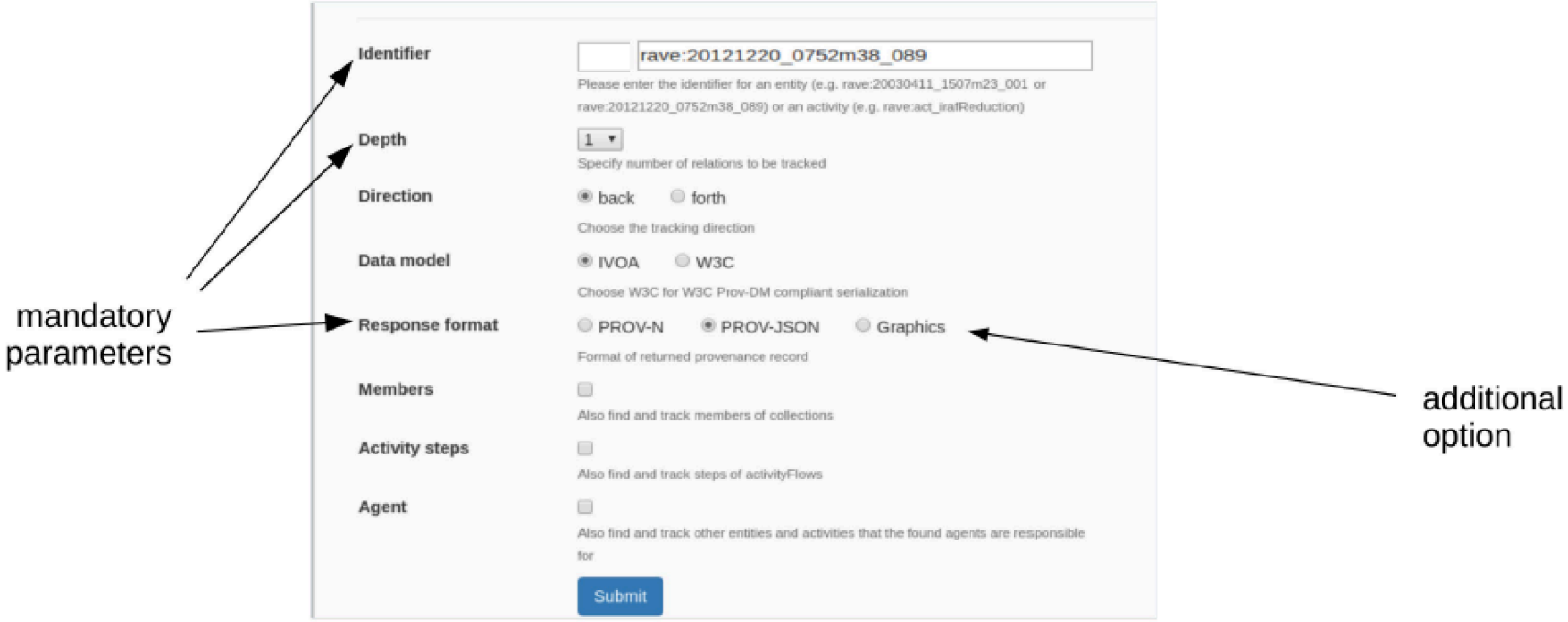


ProvSAP prototype for RAVE

- RAVE = Radial Velocity Experiments; data for half a million stars
- Prototype web application using Django framework (Python)
  (incl. description classes; however, currently not reflecting the latest model)
  - Live demo: https://escience.aip.de/provenance-rave
    (only a few test data sets available)
  - GitHub: https://github.com/kristinriebe/provenance-rave
- ProvSAP interface supporting all parameters of the current draft
- Returns PROV-N, PROV-JSON or PROV-XML
- IVOA serialization: using voprov-prefix and IVOA extensions and IVOA class/attribute names
- W3C serialization: attributes etc. renamed and mapped to create W3C compatible serialization

Parameter	Values
ID	qualified ID
DEPTH	0,1,2,..., ALL
RESPONSEFORMAT	PROV-N, PROV-JSON, PROV-XML, PROV-VOTABLE
DIRECTION	BACK, FORTH
MEMBERS	true (1) or false (0)
STEPS	true (1) or false (0)
AGENT	true (1) or false (0)
MODEL	IVOA or W3C

ProvSAP webform



Automatically generates the ProvSAP GET request URL: https://escience.aip.de/provenance-rave/provapp/provdal/?ID=rave:20121220_0752m38_089&DEPTH=1&RESPONSEFORMAT=PROV-JSON&DIRECTION=BACK&MODEL=IVOA&MEMBERS=false&STEPS=false&AGENT=false

ProvSAP

Thank you for your attention