

S3: Simple Self-described Service A simple access protocol for microphysics simulations

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Simplicity. Self-described data.



Requirements: Simplicity.

- A microphysics model is often developed by
 - a small team.
 - focused on science, not computing.
- They want to make their model available in the VO, but probably
 - not to study long and complex protocol definitions.
 - not to invest much time (or people) in developing a complex service.

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Simplicity. Self-described data.



Requirements: Simplicity.

\Rightarrow Simplicity.

 The simpler the development of the service is, the more people will be willing to implement it ⇒ more theoretical models in the VO.

Simplicity. Self-described data.



Requirements: Self-described data

• A theoretical model:

- Is not related with a real object or with spatial coordinates.
- Is defined by a set of parameters and the allowed values for each of them.
- Those parameters and values are not the same for different models.
- Even models describing similar physics are often characterized using different types of parameters.
- We need Flexibility.

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Simplicity. Self-described data.



Flexibility: Self-described data.

Self-described data.

- The server offering the model must describe itself as clearly as possible.
 - What kind of model is being offered.
 - What parameters characterize the model (what kind of queries can be done).
 - What is the physical meaning of those parameters.
 - What kind of results can be retrieved.
- The protocol must explain how a application/user can:
 - obtain that self-description in a standardized way.
 - build viable queries to the server.



S3 protocol

- Dialog between the application and the model server.
- The server must be able to answer three questions:
 - Which parameters define this model, and what values are allowed for each of them?
 - Which files are available for a given range of those parameters?
 - Give me a particular file.
- Each answer is just a VOTable document (XML)



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S3 protocol



http://www.../.../s3p.php?format=metadata



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Protocol requirements S3 protocol Conclusions

S3 protocol

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S3 protocol

The query

http://www.../.../s3p.php?id=12

Dialog between the application and the model server.

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International Virtual Observatory Alliance

IVOA Documents



S3: Proposal for a simple protocol to handle theoretical data (microsimulations) Version 1.00

IVOA Note 15 October 2008

Interest/Working Group: <u>Theory Interest Group</u> Author(s): Carlos Rodrigo, Miguel Cerviño, Enrique Solano, Patrizia Manzato Editor(s): Carlos Rodrigo, Enrique Solano

Abstract

VOSA S3 Interface S3Wizard



A working approach

- Isochrones/evolutionary tracks servers.
 - Spanish VO: NextGen, COND, DUSTY, Siess.
 - Italian VO: BATSI.
 - An application using some services to compare with user data (*iDraw*)
- A service offering synthetic photometry corresponding to 4 collections of models and more than 50 different filters.
 - An application using the service to infer physical parameters from observed data (*VOSA*).
 - Useful for science (Bayo et al, A&A 2008, in press).
- TSAP: a similar approach for the case of theoretical spectra.
 - Included as a use case in the SSAP standard.

VOSA S3 Interface S3Wizard



VOSA

XX	Spanish Virtual Observatory · Theoretical models									
svo	VOSA									
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VOSA S3 Interface S3Wizard



VOSA





HR Diagram





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S3: Simple Self-described Service

VOSA S3 Interface S3Wizard

S3 interface

Theoretical spectra Dalessio Cosiho NextGen cond00 dusty00 Kurucz Services Filters TSAP
Theoretical spectra Dalessio Coelho NextGen dusty00 Kurucz Services Fillers TSAP
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VOSA 🔹
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S3 interface

Although there are many fields in Astrophysics with a strong need of direct and rigorous comparisons between theoretical and observational data in most of the occasions, however, the different architectures, programming codes, formats,..., make it extremely difficult the comparison between them.

In the context of the IVOA Theory Interest Group, in particular for Microsimulations, in the Spanish Virtual Observatory we are working in the definition of the required framework to provide applications and services of theoretical astrophysics to the general community. One of the lines of work consists in the development of S3 (*Simple Self-described Service*), a protocol to access theoretical spectral data in a simple way.

This interface allows you to access to the data offered by any S3 server if you know its main URL, and can be used by service providers to check that they are offering their data as VO-S3 compliant.

Enter the full base URL of a S3 service, starting with http:// (not including the format=metadata parameter)



VOSA S3 Interface S3Wizard



S3 interface

XX	Spanish Virtual Observatory	· Theoretical models	Funded by
SVO Janiał Winał diservanie		URL: http://www.baeff.inita.ee//heeory/s377./db2veo4/kyph.php?&formal=metadata	
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VOSA S3 Interface S3Wizard



S3 interface

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cond00 ► dustv00 ►	logg: 1.00 - 2.00 - (value for Log(G) for the model.)	
Kurucz 🕨	meta: 0.00 v - 0.20 v (value for the Metallicity for the model.)	
Filters F TSAP F VOSA	UFI: SSS.0 (Available filters)	
Isochrones F	Search	
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S3 interface

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VOSA S3 Interface S3Wizard



S3wizard

- A wizard that helps to build a VO service for a theoretical model.
- Two inputs are needed
 - A set of ascii files containing the data corresponding to each model.
 - An ascii file with the name of every data file and the values of the parameters that characterize each file.
 - (User inputs about the meaning of parameters, data columns, curation, credits... All by a web interface.)
- The application builds:
 - The database
 - A web page with forms to download files in ascii and votable formats.
 - A VO service able to answer the three types of S3 queries

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VOSA S3 Interface S3Wizard



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VOSA S3 Interface S3Wizard



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VOSA S3 Interface S3Wizard

S3wizard

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XX	•		Sies	s et al isoch	rones		
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Config		to describe the	parameters in a us	eful way.			
* Admin User		Please, try to fi	ill in the following for	m as much as pos	ible		
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				Save Params			

VOSA S3 Interface S3Wizard

S3wizard



VOSA S3 Interface S3Wizard

S3wizard

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- **Simple**: http queries + dialog + votable.
 - not discarding more complex protocols where they are needed.
- Useful:
 - Developers can make their models available in the VO.
 - Applications can access those models.
- Something like what ConeSearch is for catalogues:
 - an easy, fast and effective way to develope a theoretical service in the VO.

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THANK YOU!

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