

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

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Requirements Protocol A working approach



Requirements

- Simplicity.
 - The simpler the development of the service is, the more people will be willing to implement it ⇒ more theoretical models in the VO.
- Flexibility.
 - Self-described data/service.
 - The protocol explains how the service must describe itselt and how that description must be understood and used.

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Requirements Protocol A working approach



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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Tool/Data servers VO (S3) interactions







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Tool/Data servers VO (S3) interactions





- The tool (typically) builds a form with search parameters.
- The user selects ranges for the model parameters

(In S3 this can be a multi-step interaction)

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Tool/Data servers VO (S3) interactions



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Tool/Data servers VO (S3) interactions



 The tool builds the table with the results and offers possible options to the user

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Tool/Data servers VO (S3) interactions

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Tool/Data servers VO (S3) interactions



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International Virtual Observatory Alliance

IVOA Documents

IVOA Note



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

The aim of this document is to suggest a new protocol designed to provide access to theoretical data/services in the

Requirements Protocol A working approach



A working approach

- SSAP: a very similar approach for the case of theoretical spectra.
- Isochrones/evolutionary tracks servers.
 - Spanish VO: NextGen, COND, DUSTY, Siess.
 - Italian VO: BATSI.
- Synthetic photometry service.
- An application using these services to infer physical parameters from observed data (*VOSA*)
 - ullet \sim 200 registered users
- Used for science (Bayo et al, A&A 2008, 429,277B)
- Asteroseismology.

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Requirements Protocol A working approach



Utilities

S3 wizard

- A wizard that helps to build a VO service for a theoretical model.
- Simple inputs
- The application builds the database, S3 services...
- S3 interface
 - A web interface to test any S3 service.
 - It shows how an application is expected to understand (or not) your service.

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Asteroseismology services and VO tool

- Currently 4 different codes integrated.
 - CESAM, CESAM2k structure codes.
 - FILOU, GraCo oscillation codes.
 - More that 500.000 models.
 - Almost 1Tb of data.
 - Growing.
- All interactions between tool and data services: S3
- First version of a Data Model for asteroseismology data.
 - 17 star global properties.
 - 44 star shell variables.
 - 35 seismic properties.
- A complex case.

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Asteroseismology

1.- Application: query

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

3.- Application: ..

Granada Stellar Seismic Models

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Remember that only the marked parameters will be used in the search (they don't need to be the same than the ones marked to be shown in the list of r





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Granada Stellar Seismic Models

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S3: Simple Self-described Service



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4.- Application: query

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SUMMARY request

- In some cases the search produces a huge amount of results
 - Big computation time in the server side
 - Big VOTable download time
 - Even browser dies trying to display it
- First ask for summary
 - ?...&request=summary
 - Number of results available
 - Range available for each search parameter (once user constrains are applied)
- Very useful

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Asteroseismology

SUMMARY request



• Very useful

C. Rodrigo Blanco S3: Simple Self-described Service

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Asteroseismology



7.- Application: queries (...)

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9.- Application: ..



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<te>7.8692972501128+10</te>	<t0>7.2880e-11</t0>	<18>5712.6486 18	<tb>2565.1690</tb>	
<t0-7. 86829442152764204="" t8-<br=""><t8-< th=""><td>CTRUE TERMS 11/ (TR)</td><td></td><td></td><td>- 11</td></t8-<></t0-7.>	CTRUE TERMS 11/ (TR)			- 11
		<tb>5714.1482</tb>	(10-3027.7236)/10-	
*TE** 0007277247600-201710	(18)7.15428-11//18)	<10+5714.1482 10+<br <10+5716.2689 10+</td <td><t0+8027.7286< t0+<br=""><t0+8626.1262+ t0+<="" td=""><td>9 9 9</td></t0+8626.1262+></t0+8027.7286<></td>	<t0+8027.7286< t0+<br=""><t0+8626.1262+ t0+<="" td=""><td>9 9 9</td></t0+8626.1262+></t0+8027.7286<>	9 9 9

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Asteroseismology



7.- Application: queries (...)

http://www.../.../s3p.php?id=100&type=osc

9.- Application: ..



8 Serve	r: ansv	wers ()	
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<tb> <tb>7.8701800974920+10+/TB></tb></tb>	«TB»7.4424e-11«/TB»	«TB-5709. 3156»/TB-	«TB+1350.0334«/TB+	
<te>7.8701453910408+10</te>	<t0-7.4375e-11< t0-<="" td=""><td><18>579.4051<!--18--></td><td><t0>1389.4471</t0></td><td></td></t0-7.4375e-11<>	<18>579.4051 18	<t0>1389.4471</t0>	
<te>7. 8700899084606+20</te>	<t0-7.420ia-11< t0-<="" td=""><td><t8+5309.5323+ t8+<="" td=""><td><tr-1442.52064 td="" tr-<=""><td></td></tr-1442.52064></td></t8+5309.5323+></td></t0-7.420ia-11<>	<t8+5309.5323+ t8+<="" td=""><td><tr-1442.52064 td="" tr-<=""><td></td></tr-1442.52064></td></t8+5309.5323+>	<tr-1442.52064 td="" tr-<=""><td></td></tr-1442.52064>	
<te>7.8700246863562×20×/TE></te>	<t0+7.42114-11+ t0+<="" td=""><td><t0+5709.7130+ t0+<="" td=""><td>«T0»1518.7500«/T0»</td><td> 10</td></t0+5709.7130+></td></t0+7.42114-11+>	<t0+5709.7130+ t0+<="" td=""><td>«T0»1518.7500«/T0»</td><td> 10</td></t0+5709.7130+>	«T0»1518.7500«/T0»	10
<te>7.8699165771878+10</te>	<t0+7.4079e-11< t0=""></t0+7.4079e-11<>	<t8+5709.9707× t8+<="" td=""><td><t0>1622.9355</t0></td><td></td></t8+5709.9707×>	<t0>1622.9355</t0>	
<te>7.8697917703046+10</te>	<t0-7.1898e-11< ti=""></t0-7.1898e-11<>	<10>5710.3367 10	<ti01765.8117< ti=""></ti01765.8117<>	
<te>7.8696374487920+10+/TB></te>	<t0+7.1652x-114 t0+<="" td=""><td><t0>5710.0571</t0></td><td><t0>1968.0116</t0></td><td></td></t0+7.1652x-114>	<t0>5710.0571</t0>	<t0>1968.0116</t0>	
<tb> <tb>7.8694523965740+10+/TB></tb></tb>	<t0+7.0020e-11+ t0+<="" td=""><td><t0+5711.5969+ t0+<="" td=""><td>«TB+2222.2820»/TB+</td><td></td></t0+5711.5969+></td></t0+7.0020e-11+>	<t0+5711.5969+ t0+<="" td=""><td>«TB+2222.2820»/TB+</td><td></td></t0+5711.5969+>	«TB+2222.2820»/TB+	
<te>7.8692972503328+10</te>	<t8>7.2880e-11</t8>	<10-5712.6486 10	<tb>2565.1690-/TB></tb>	
<te>7.8689944215226+204/TE></te>	<t0>7.2299e-11</t0>	<t0-5714.1482< t0=""></t0-5714.1482<>	<t8+8027.72864 t8+<="" td=""><td></td></t8+8027.72864>	
<tb> +TB>7.8607277247680+20+/TB></tb>	«TB»7.1542a-11«/TB»	«TB+5716.2669»/TB+	<t0+3626.1369+ t0+<="" td=""><td>- 10</td></t0+3626.1369+>	- 10
<te> <te>7.8684416394392+10</te></te>	<t0+7.0563e-11< t0=""></t0+7.0563e-11<>	<t8+5715.2832< t8+<="" td=""><td><tb>4355.8750-/TB></tb></td><td></td></t8+5715.2832<>	<tb>4355.8750-/TB></tb>	
(TE>7.8681408121346+10	<t0-6.8008e-11< t0=""></t0-6.8008e-11<>	<t8>5723.5646</t8>	<t8+5395.9820- t8+<="" td=""><td></td></t8+5395.9820->	
<te>7.8578294541225+10+/T8></te>	<t0+6.7713x-114 t0=""></t0+6.7713x-114>	<t0+5729. 6370+="" t0+<="" td=""><td><t0+6653.0057+ t0+<="" td=""><td></td></t0+6653.0057+></td></t0+5729.>	<t0+6653.0057+ t0+<="" td=""><td></td></t0+6653.0057+>	
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Asteroseismology



7.- Application: queries (...)

http://www.../.../s3p.php?id=100&type=osc

9.- Application: ...



8 Serve	r: ans	wers ()	
<pre>"WITABLE version="1.1" solar="http://www.iv -RESAURCE type="data"></pre>	en.net/est/W01able/v1.1* xai	echenal.ecation="http://www.i	ivos.net/xel/V07able/v1.1**	-1979 - 1
<pre>«PARAE manes "concepts" values "http://it <table></table></pre>	callost:00/carlos/svs/theory	/estresias/concepts.php*//>		- 8
CELLD maner'r' and "phys size ratio descellering-distance to the certer office.	of the stary/MSCRIPTIGE-	ios" datatype="float">		- 1
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<pre>detter "temp" and "plot temperal detsettime Temperature at a distance</pre>	are white "K" algor "Doll. T more r from the center: 7(r))	<pre>cmp" datatype="float"> </pre>		- 1
*FILLS mane**pressure* acd**phys.pres *BESCRIPTION*Pressure at distance of the second seco	from the center: P(rl) 4/86	"Shell, Pressure" datatype="fl SCRIPTION-	Leat **	- 1
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<pre><field mane**dtdp*="" ucd**arith.grad,<br=""><#ESCREPTINE-Called *real gradient*</field></pre>	you temperature ploy press	re as a function of the pres	linalient" datatype="float"> sure) (adimensional)=/HESCRIP	
-/TELD -FIELD maner*tun* wod**phys.tunizesit -BESCHIFTIGE/Lunizesity at distance	y" mailt="erg/s" stype="Shell or from the center : L(r) </td <td>Luminomity" datatype="float" DESCREPTION-</td> <td></td> <td>- 1</td>	Luminomity" datatype="float" DESCREPTION-		- 1
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<te>7. E70145351040E+10</te>	(10)7.4375e-11-(710)	<78>5709.4051 78	<tb>1389.4471</tb>	
<te>7. E700835084605+10</te>	<tb>7.4305a-11</tb>	<t8>5329</t8>	<t0+1443.53364 t0+<="" td=""><td></td></t0+1443.53364>	
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<te>7.8699565771878+10</te>	<t0+7.4079e-11< t0+<="" td=""><td><t8>5709.9707</t8></td><td><t0>1622.9355</t0></td><td></td></t0+7.4079e-11<>	<t8>5709.9707</t8>	<t0>1622.9355</t0>	
<te>7.8697917703046+10</te>	<te-7.3898e-11< te=""></te-7.3898e-11<>	<t8-5710.3367< t8=""></t8-5710.3367<>	<t0-1765.8317-(t0-<="" td=""><td></td></t0-1765.8317-(>	
<te> <te>7.8696374497925+L0+/TE></te></te>	(TB+7. 1652x-114/TB+	<t0-5710.0571- t0-<="" td=""><td></td><td></td></t0-5710.0571->		
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CHEP CTID-7, 80820772503328+50-(/TB)- CTID-7, 8082044325278+50-(/TB)- CTID-7, 8082044325278+50-(/TB)- CTID-7, 8087277247585+50-(/TB)- CTID-7	(TD-7, 11236-11) (7TD- (TD-7, 20036-11) (7TD- (TD-7, 22396-11) (7TD- (TD-7, 12426-11) (7TD-	<0.00000000000000000000000000000000000	<10+2568.0224/10+ <10+2222.2820+/10+ <10+2568.100+//10+ <10+3027.7284+/10+ <10+3628.1189+/10+	6 6 6 6 6 6
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Asteroseismology

CUTOUT?

- Data files are often very big with many columns
 - Being able to ask only for the wanted columns
 - In the desired range for each one
 - ?...cols=alfa,beta...&ranges=a1/a2,b1/b2...
- Being able to ask which columns are available
 - request=summary ?
 - We don't really need it in this case (data model)
- More efficiency







- Even for quite complex cases.
- First version of a data model for asteroseismology
- Some improvements
 - SUMMARY
 - CUTOUT

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THANK YOU!

C. Rodrigo Blanco S3: Simple Self-described Service