Project Number: **RI-312579**

Project Acronym: **ER-flow**

Project Full Title:

Building an European Research Community through Interoperable Workflows and Data

Theme: **Research Infrastructures**
Call Identifier: **FP7-Infrastructures-2012-1**
Funding Scheme: **Coordination and Support Action**

Annex C – Heliophysics Community

Due date of deliverable: 28/08/2013
Actual submission date: --/--/2013
Start date of project: 01/09/2012
Duration: 24 months

Lead Contractor: University of Westminster
Dissemination Level: PU
Version: 1.0

ER-flow is supported by the FP7 Capacities Programme under contract no RI-312579

1 Table of Contents

Contents

2 List of Figures

3 List of Tables

4 Status and Change History

Status:	**Name:**	**Date:**	**Signature:**
Draft:	Gabriele Pierantoni	16/08/2014	n.n. electronically
Reviewed:			n.n. electronically
Approved:			n.n. electronically

Table 1, Deliverable Status

Version	**Date**	**Pages**	**Author**	**Modification**
0.1	29/09/14	All	GP	Created

Table 2, Deliverable Change History

5 Glossary

SSP	SHIWA Simulation Platform
WP	Work package

Table 3, Glossary

5.1 Metaworkflows

5.1.1 Type II CME

5.1.1.1 Nature and Relevance

This workflow addresses the science case of paragraph **Error! Reference source not ound.**, its goal is to show that a shock observed at radio wavelengths had a counterpart observed in situ, with the two being linked by the propagation of a CME through the solar system.

5.1.1.2 Workflow Details

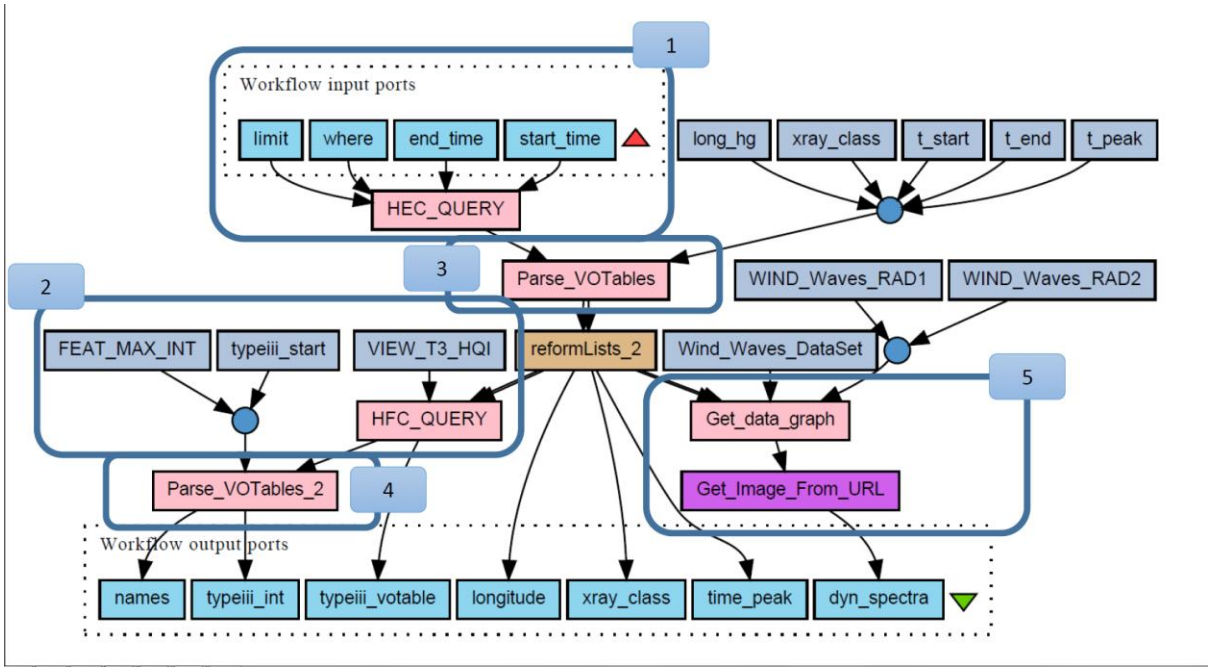

Figure 1, CME II Meta-workflow

5.1.1.3 Sub-Workflows

Name	Description	Type	ID
HECQueryWhatParam	HEC Query (with SQL condition) Query web service 1	Taverna	3893
HECQuerySimple	HFC Query Query web service 2	Taverna	4119
VoTableExtractor	Parse XML Table	Taverna	1991
WindWavesQuickLook	Get WAVES plot Query	Taverna	3163

5.1.1.4 Input/Output

Input

long_hg – String	the longitude of the cme along the surface of the sun
xray_class – String	the class of X-RAY emission
t_start – String	start time
t_end – String	end_time
t_peak – String	peak time

Output

names	Names of the VO Table columns
typeii_int	Identifier of the CME
typeii_votable	VOTABLE that describes the CME
longitude	longitude of the CME
xray_class	XRAY Class of the CME
time_peak	Peak time of the event
dyn_spectra	Spectra of the phenomena

5.1.1.5 Further Technical Details

Information	URL
SHIWA Repository	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/public/edit-application.xhtml?appid=5785
Application description template	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5785&filename=CMETypeII.pdf
User documentation	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5785&filename=ScienceCase.CmeTypeII.pdf
Contact details	Dr. Pierantoni – pierang@cs.tcd.ie

Table 4, Application 1 application technical details

5.1.2 CME-CIR

5.1.2.1 Nature and Relevance

This workflow addresses the science case described in paragraph **Error! Reference source ot found.**. It uses in-situ data to identify if a CME or CIR is observed; then it uses this to detail the characteristics of each phenomena in the imaging observations.

5.1.2.2 Workflow Details

This is a TAVERNA meta-workflow.

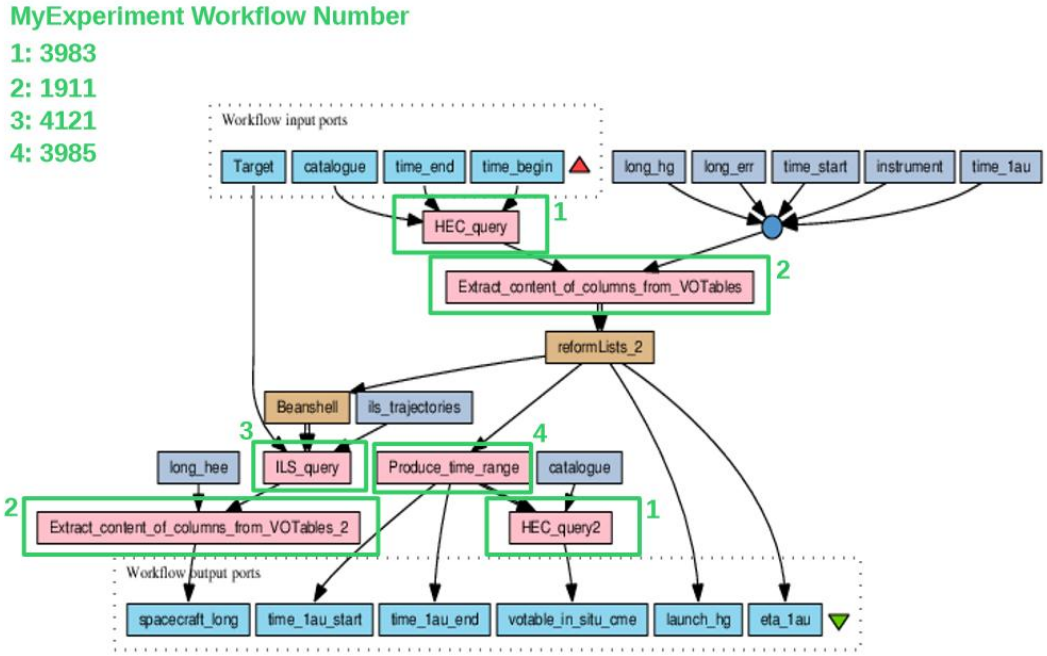

Figure 2, CME II Meta-workflow

5.1.2.3 Sub-Workflows

Name	Description	Type	ID
HECQueryWhatParam	HEC Query (with SQL condition) Query web service 1	Taverna	3893
TimeRangeGenerator	Produces a time range from a date	Taverna	3985
VoTableExtractor	Parse XML Table	Taverna	1991
ILSQuery	Queries the Instrument Location Service	Taverna	4121

5.1.2.4 Input/Output

Input

Target - String	The object hit by the CME or CIR
Catalogue - String	The catalogue to be used in the HEC to find the events
Time_end - String	The start time of the event
Time_begin - String	The end time of the event

Output

spacecraft_long	The longitude of the spacecraft
launch_hg	No comment available
eta_1au	Expected Time of arrival at 1 Astronomical Unit
time_1au_start	Start time at 1 Astronomical Unit
time_1au_end	End Time at 1 Astronomical Unit
votable_in_situ_cme	VoTable with the in-situ data

5.1.2.5 Further Technical Details

Information	URL
SHIWA Repository	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/public/edit-application.xhtml?appid=5787
Application description template	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5787&filename=CME-CIR.pdf
User documentation	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5787&filename=ScienceCase.CME-CIR.pdf
Contact details	Dr. Pierantoni – pierang@cs.tcd.ie

Table 5, Application 1 application technical details

5.1.3 CME-RadioBursts

5.1.3.1 Nature and Relevance

Eruptive activity in the solar atmosphere can result in the ejection of plasma known as a coronal mass ejection (CMEs). CMEs often drive shock waves through the solar system, which can cause intense radio emission known as a type II CMEs. However, although shocks may be readily identified using both radio and in-situ data, few studies have been performed regarding the relationship between these observables. This workflow correlates the data of the CME and the radio emissions.

5.1.3.2 Workflow Details

This is a ws-pgrade metaworkflow that uses three atomic sub-workflows to invoke the HEC and HFC service.

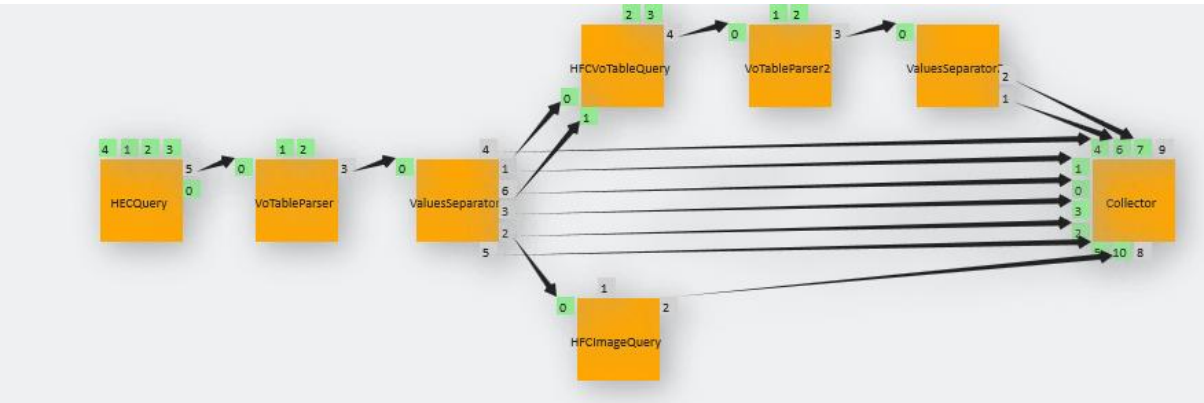

Figure 3, CME II Meta-workflow

5.1.3.3 Sub-Workflows

Name	Description	Type	ID
HECQueryWSPGRADE	HEC query	WS-PGRADE	5741
HFCVoTableQuery	Returns a VoTable from the HFC	WS-PGRADE	5784
HFCVoImageQuery	Returns an Image from the HFC	WS-PGRADE	5783

5.1.3.4 Input/Output

Input

HFCVoTableQuery_Catalogue - String	The feature catalogue to be used in the HFCVoTableQuery
HFCVoTableQuery_OutputName - String	The name of the votable returned by the HFC – defaults to http://voparis-helio.obspm.fr:8080
VoTableParser_Filters – String	Filters to be applied to the VoTable
VoTableParser_ExtractedValues – String	The values to be extracted from the VoTable returned by the HEC
HECQuery_Service – String	The service to be used by the HEC –

	Defaults to http://hec.helio-vo.eu/hec
HECQuery_Catalogue - String	The catalogue to be used by the HEC sub-workflkow
HECQuery_StartTime - String	The start time of the query period
HECQuery_EndTime – String	The end time of the query period
HECQuery_VoTableName – String	The name of the votable – defaults to hec-vottable.xml
HFCVoTableQuery_Catalogue - String	NA – Defaults to an empty String
VoTableParser2_ExtractedValues - String	The values to be extracted from the VoTable returned by the HFCVoTableQuery sub-workflow

Output

Collector_CorrelationTable – File	The correlation table
Collector_CompleteTable – File	Complete table of results
HFCImageQuery_Image - File	List of images returned by the HFC

Example

HFCVoTableQuery_Catalogue	Filaments
HFCVoTableQuery_OutputName	hfc-votable.xml
VoTableParser_Filters – String	m, x
VoTableParser_ExtractedValues – String	Start_time, end_time, longitude, xray-class
HECQuery_Service – String	http://hec.helio-vo.eu/hec
HECQuery_Catalogue - String	soho_lasco_cme
HECQuery_StartTime - String	2001-01-01T00:00:00
HECQuery_EndTime – String	2001-01-03T00:00:00
HECQuery_VoTableName – String	hec-votable.xml
HFCVoTableQuery_Catalogue - String	" "
VoTableParser2_ExtractedValues - String	Start_time, peak_time, longitude

5.1.3.5 Further Technical Details

Information	URL
SHIWA Repository	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/public/edit-application.xhtml?appid=5782
Application description template	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5782&filename=CMERadioBursts.pdf
User documentation	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5782&filename=ScienceCase.CmeAndRadioBursts.pdf
Contact details	Dr. Pierantoni – pierang@cs.tcd.ie

Table 6, Application 1 application technical details

5.2 Workflows

5.2.1 Remote CME Forward Propagation

5.2.1.1 Nature and Relevance

This workflow calculates the forward propagation of a Coronal Mass Ejection (CME) from the Sun to the outer bodies of the Solar System. It invokes the SHEBA propagation model that is executed remotely on a web service that exposes the HELIO Processing Service interface

5.2.1.2 Workflow Details

This workflow takes as input the details of the CME and returns the Expected Times at Arrival (ETAs) for the various bodies of the Solar System.

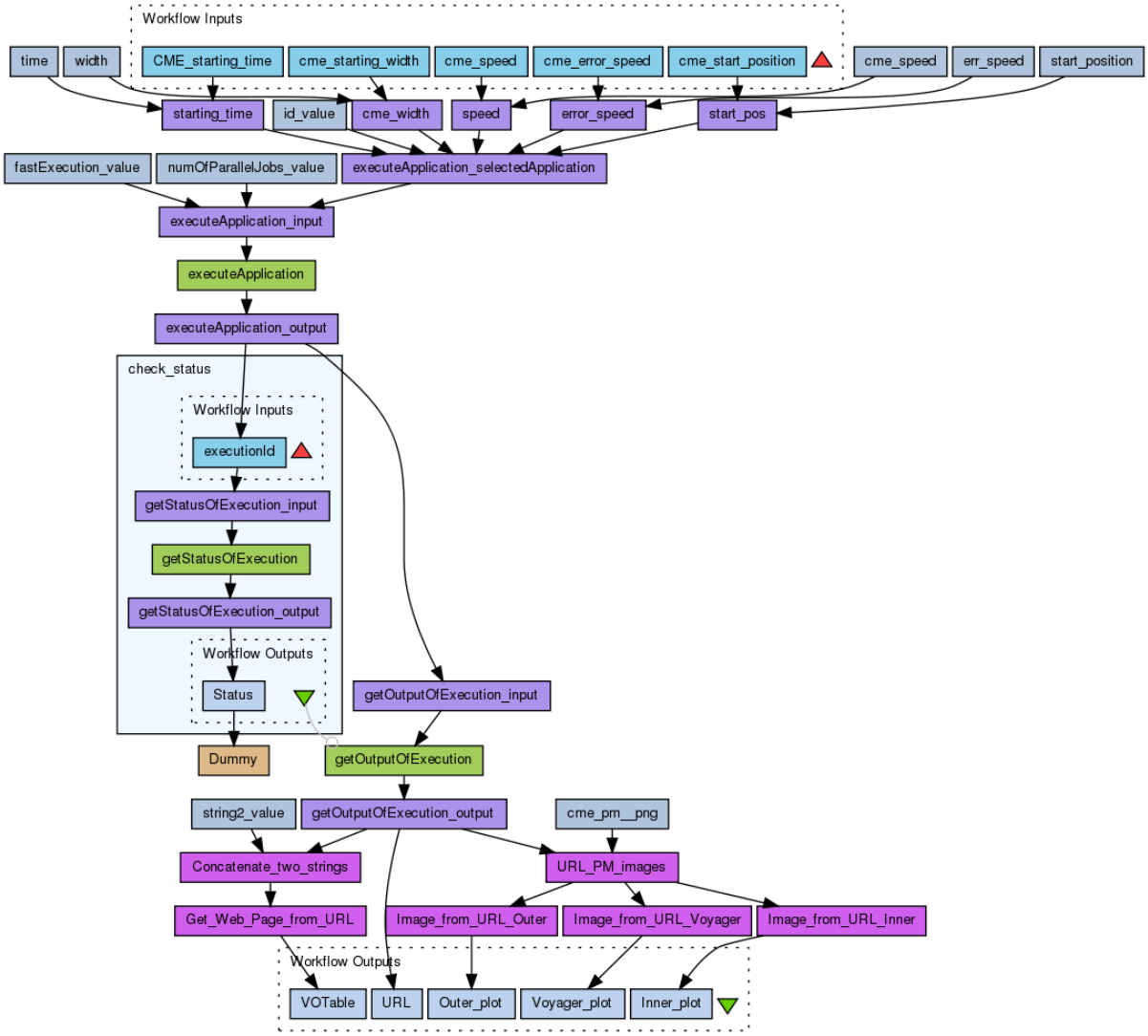

Figure 4, Taverna Workflow for the Remote CME Forward Propagation Model

5.2.1.3 Software Details

Name	Description	Reference
HELIO Processing Service (HPS)	HELIO Processing Service	
SHEBA	Propagation Model	https://github.com/dpshelio/SHEBA/blob/master/documentation/sheba.org
VOTABLE	XML format for astrophysics and heliophysics data	http://www.ivoa.net/documents/VOTable/

Table 7, Software Details of the Remote CME Forward Propagation Model

5.2.1.4 Input/Output

Input Data

Date : YYYY-MM-DD"T"HH:MM:ss	Every valid date
Width : String	From 0 to 360 degrees
Speed : String	A positive integer
Error Speed : String	A positive integer
Longitude : String	A positive integer

Output Data

URL: String	The URL of the stored results
VoTable: VoTable	VoTable with the expected arrival times
Inner_Plot: Image	Image with the ETA in the inner solar system
Outer_Plot: Image	Image with the ETA in the outer solar system
Voyager_Plot: Image	Image with the ETA for voyager

5.2.1.5 Further Technical Details

Information	URL
SHIWA Repository	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/public/edit-application.xhtml?appid=5756
Application description template	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5756&filename=RemoteCMEForwardPropagation.Taverna.pdf
User documentation	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5756&filename=RemoteCMEForwardPropagation.Taverna.pdf
Software documentation	https://github.com/dpshelio/SHEBA/blob/master/documentation/sheba.org
Contact details	Gabriele Pierantoni – pierang@cs.tcd.ie

Table 8, Technical Details of the Remote CME Forward Propagation Model

5.2.2 Remote CME Backward Propagation

5.2.2.1 Nature and Relevance

This workflow calculates the backward propagation of a Coronal Mass Ejection (CME) from the outer bodies of Solar System back to the Sun. It invokes the SHEBA propagation model that is executed remotely on a web service that exposes the HELIO Processing Service interface.

5.2.2.2 Workflow Details

This workflow takes as input the details of the CME and the body that was hit by the CME and returns the Expected Times at Arrival at the Sun.

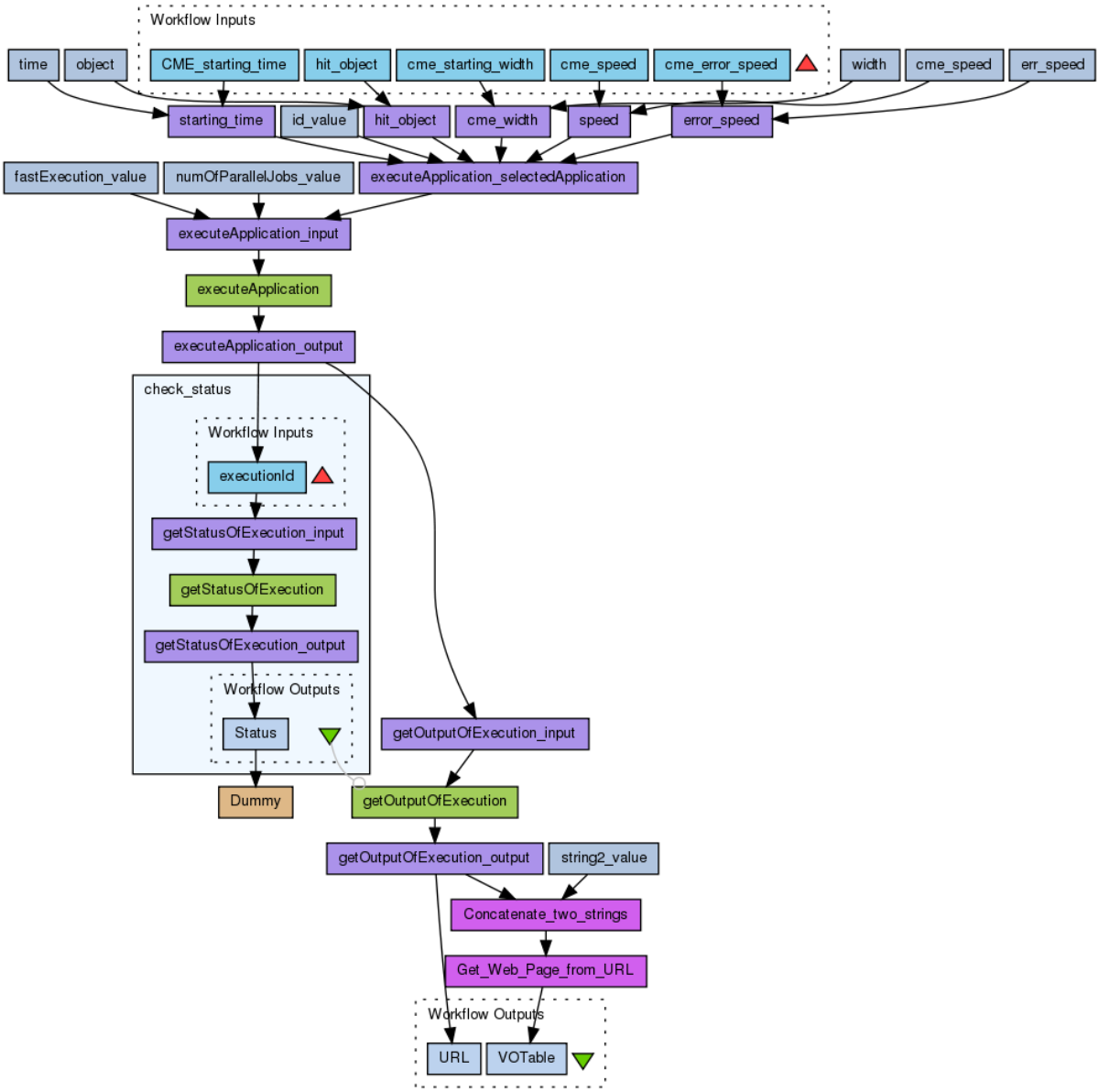

Figure 5, Taverna Workflow for the Remote CME Backward Propagation Model

5.2.2.3 Software Details

Name	Description	Reference
HELIO Processing Service (HPS)	HELIO Processing Service	
SHEBA	Propagation Model	https://github.com/dpshelio/SHEBA/blob/master/documentation/sheba.org
VOTABLE	XML format for astrophysics and heliophysics data	http://www.ivoa.net/documents/VOTable/

Table 9, Software Details of the Remote CME Forward Propagation Model

5.2.2.4 Input/Output

Input Data

Date : YYYY-MM-DD"T"HH:MM:ss	Every valid date
Width : String	From 0 to 360 degrees
Speed : String	A positive integer
Error Speed : String	A positive integer
Hit Object : String	A String among: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto, Cassini, Dawn, Galileo, Messenger, New Horizons, Rosetta, STEREO A, STEREO B, Ulysses, Voyager A, Voyager B.

Output Data

URL: String	The URL of the stored results
VoTable: VoTable	VoTable with the expected arrival times

5.2.2.5 Further Technical Details

Information	URL
SHIWA Repository	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/public/edit-application.xhtml?appid=5757
Application description template	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5757&filename=RemoteCMEBackwardPropagation.Taverna.pdf
User documentation	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5757&filename=RemoteCMEBackwardPropagation.Taverna.pdf
Software documentation	https://github.com/dpshelio/SHEBA/blob/master/documentation/sheba.org
Contact details	Gabriele Pierantoni – pierang@cs.tcd.ie

Table 10, Technical Details of the Remote CME Forward Propagation Model

5.2.3 Remote CIR Forward Propagation

5.2.3.1 Nature and Relevance

This workflow calculates the forward propagation of a Co-rotating Interactive Region (CIR) from the Sun to the outer bodies of the Solar System. It invokes the SHEBA propagation model that is executed remotely on a web service that exposes the HELIO Processing Service interface

5.2.3.2 Workflow Details

This workflow takes as input the details of the CIR and returns the Expected Times at Arrival (ETAs) for the various bodies of the Solar System.

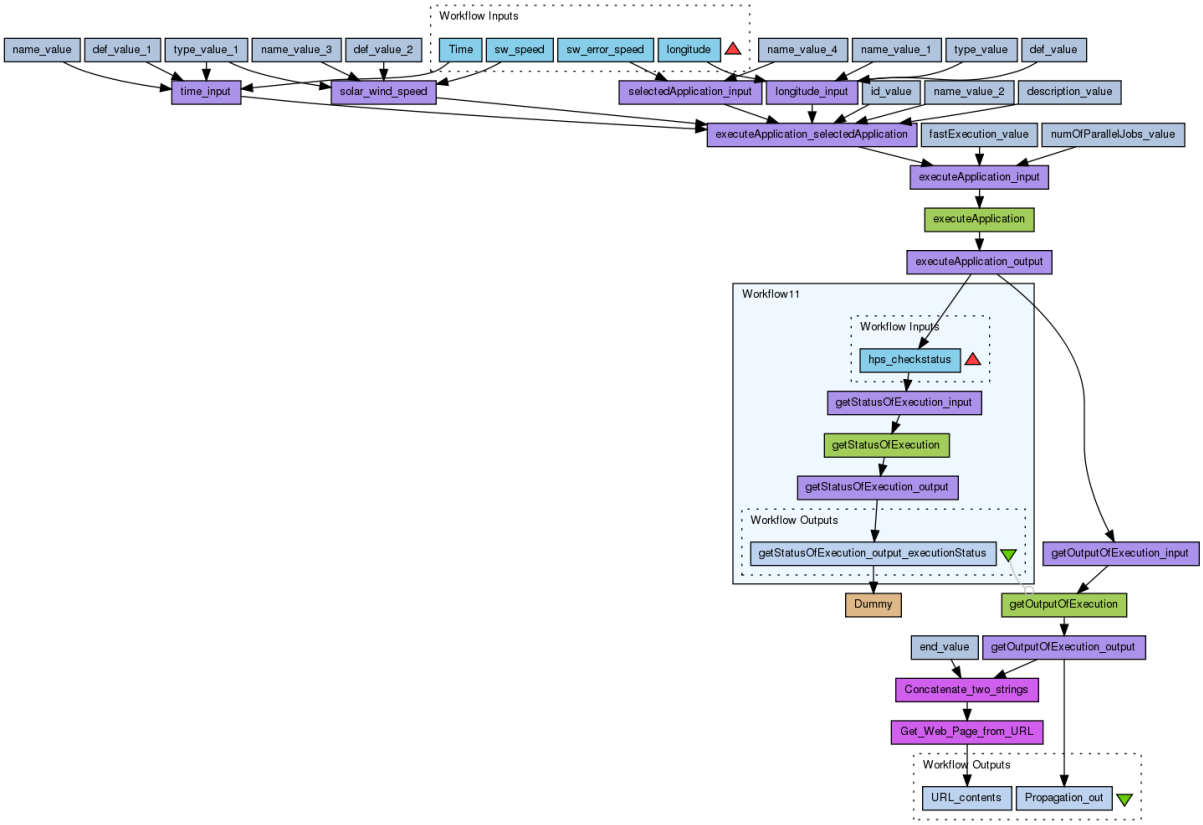

Figure 6, Taverna Workflow for the Remote CIR Forward Propagation Model

5.2.3.3 Software Details

Name	Description	Reference
HELIO Processing Service (HPS)	HELIO Processing Service	
SHEBA	Propagation Model	https://github.com/dpshelio/SHEBA/blob/master/documentation/sheba.org
VOTABLE	XML format for astrophysics and heliophysics data	http://www.ivoa.net/documents/VOTable/

Table 11, Software Details of the Remote CIR Forward Propagation Model

5.2.3.4 Input/Output

Input Data

Date : YYYY-MM-DD"T"HH:MM:ss	Every valid date
Speed : String	From 0 to 1 (Fractions of the speed of light)
Error Speed : String	A positive integer
Longitude : String	A positive integer

Output Data

URL: String	The URL of the stored results
VoTable: VoTable	VoTable with the expected arrival times

Sample Data

Date	2001-01-01T00:00:00
Speed	0.5
Error Speed	0.05
Longitude	0

5.2.3.5 Further Technical Details

Information	URL
SHIWA Repository	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/public/edit-application.xhtml?appid=5758
Application description template	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5758&filename=RemoteCIRForwardPropagation.Taverna.pdf
User documentation	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5758&filename=RemoteCIRForwardPropagation.Taverna.pdf
Software documentation	https://github.com/dpshelio/SHEBA/blob/master/documentation/sheba.org
Contact details	Gabriele Pierantoni – pierang@cs.tcd.ie

Table 12, Technical Details of the Remote CME Forward Propagation Model

5.2.4 Remote CIR Backward Propagation

5.2.4.1 Nature and Relevance

This workflow calculates the backward propagation of a Co-Rotating Interactive Region (CIR) from the outer bodies of Solar System back to the Sun. It invokes the SHEBA propagation model that is executed remotely on a web service that exposes the HELIO Processing Service interface.

5.2.4.2 Workflow Details

This workflow takes as input the details of the CME and the body that was hit by the CME and returns the Expected Times at Arrival at the Sun.

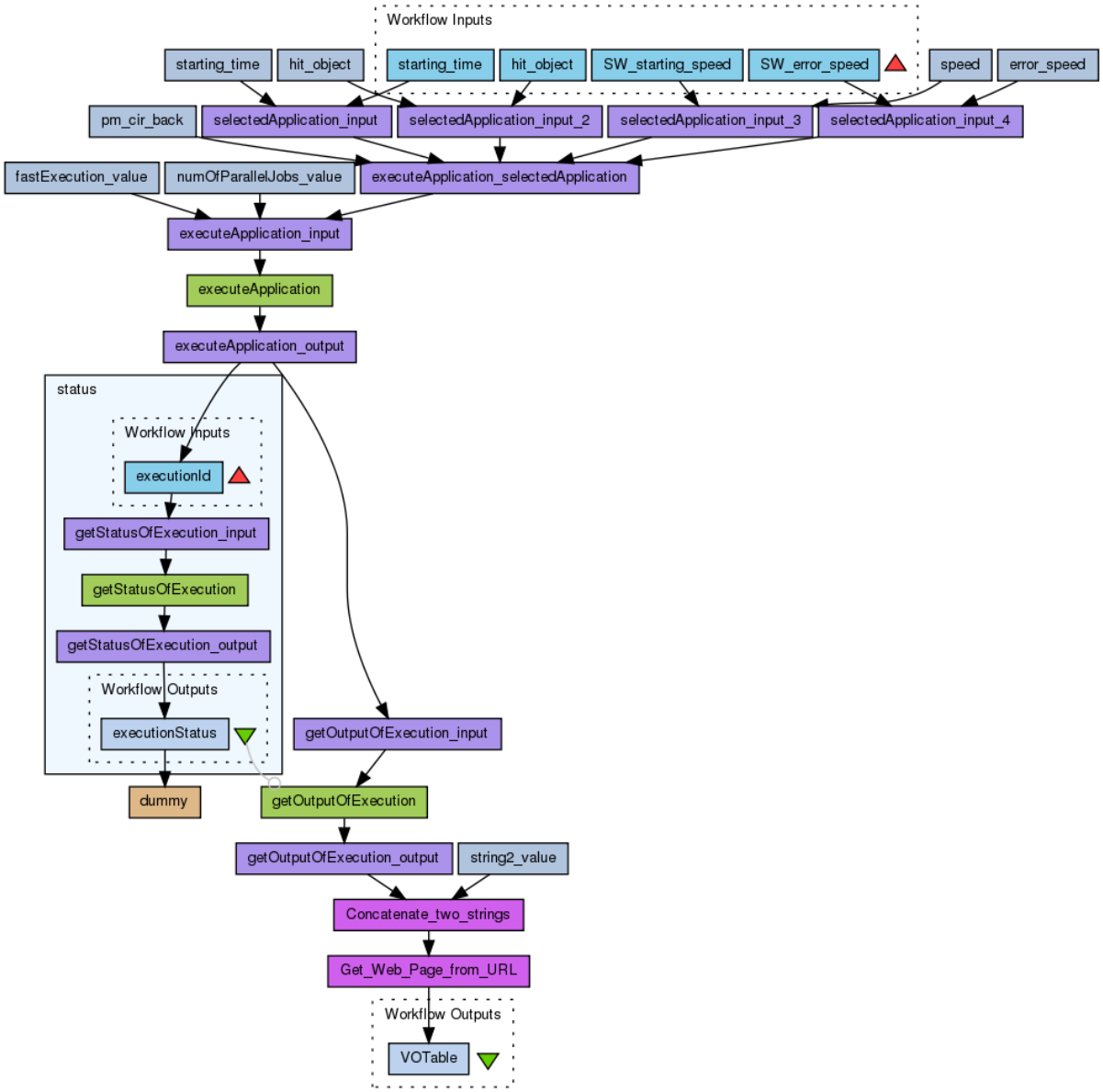

Figure 7, Taverna Workflow for the Remote CIR Backward Propagation Model

5.2.4.3 Software Details

Name	Description	Reference
HELIO Processing Service (HPS)	HELIO Processing Service	
SHEBA	Propagation Model	https://github.com/dpshelio/SHEBA/blob/master/documentation/sheba.org
VOTABLE	XML format for astrophysics and heliophysics data	http://www.ivoa.net/documents/VOTable/

Table 13, Software Details of the Remote CIR Backward Propagation Model

5.2.4.4 Input/Output

5.2.4.5 Further Technical Details

Information	URL
SHIWA Repository	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/public/edit-application.xhtml?appid=5759
Application description template	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5759&filename=RemoteCIRBackwardPropagation.Taverna.pdf
User documentation	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5759&filename=RemoteCIRBackwardPropagation.Taverna.pdf
Software documentation	https://github.com/dpshelio/SHEBA/blob/master/documentation/sheba.org
Contact details	Gabriele Pierantoni – pierang@cs.tcd.ie

Table 14, Technical Details of the Remote CME Forward Propagation Model

5.2.5 Remote CME Backward Propagation

5.2.5.1 Nature and Relevance

This workflow calculates the backward propagation of a Coronal Mass Ejection (CME) from the outer bodies of Solar System back to the Sun. It invokes the SHEBA propagation model that is executed remotely on a web service that exposes the HELIO Processing Service interface.

5.2.5.2 Workflow Details

This workflow takes as input the details of the CME and the body that was hit by the CME and returns the Expected Times at Arrival at the Sun.

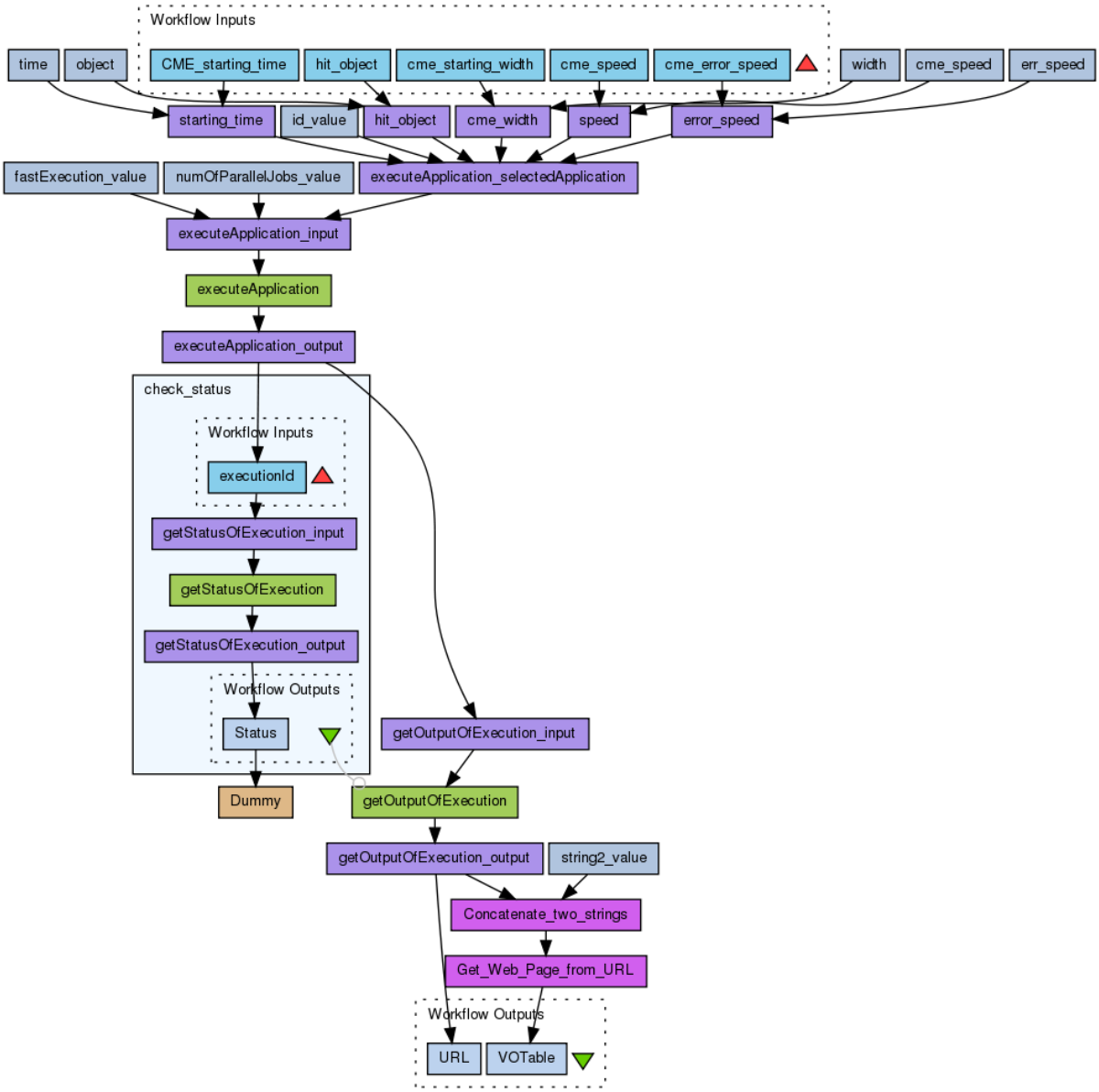

Figure 8, Taverna Workflow for the Remote CME Backward Propagation Model

5.2.5.3 Software Details

Name	Description	Reference
HELIO Processing Service (HPS)	HELIO Processing Service	
SHEBA	Propagation Model	https://github.com/dpshelio/SHEBA/blob/master/documentation/sheba.org
VOTABLE	XML format for astrophysics and heliophysics data	http://www.ivoa.net/documents/VOTable/

Table 15, Software Details of the Remote CME Forward Propagation Model

5.2.5.4 Input/Output

Input Data

Date : YYYY-MM-DD"T"HH:MM:ss	Every valid date
Width : String	From 0 to 360 degrees
Speed : String	A positive integer
Error Speed : String	A positive integer
Hit Object : String	A String among: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto, Cassini, Dawn, Galileo, Messenger, New Horizons, Rosetta, STEREO A, STEREO B, Ulysses, Voyager A, Voyager B.

Output Data

URL: String	The URL of the stored results
VoTable: VoTable	VoTable with the expected arrival times

5.2.5.5 Further Technical Details

Information	URL
SHIWA Repository	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/public/edit-application.xhtml?appid=5757
Application description template	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5757&filename=RemoteCMEBackwardPropagation.Taverna.pdf
User documentation	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5757&filename=RemoteCMEBackwardPropagation.Taverna.pdf
Software documentation	https://github.com/dpshelio/SHEBA/blob/master/documentation/sheba.org
Contact details	Gabriele Pierantoni – pierang@cs.tcd.ie

Table 16, Technical Details of the Remote CME Forward Propagation Model

5.2.6 Remote SEP Forward Propagation

5.2.6.1 Nature and Relevance

This workflow calculates the forward propagation of a Solar Energetic Particle (SEP) from the Sun to the outer bodies of the Solar System. It invokes the SHEBA propagation model that is executed remotely on a web service that exposes the HELIO Processing Service interface

5.2.6.2 Workflow Details

This workflow takes as input the details of the CIR and returns the Expected Times at Arrival (ETAs) for the various bodies of the Solar System.

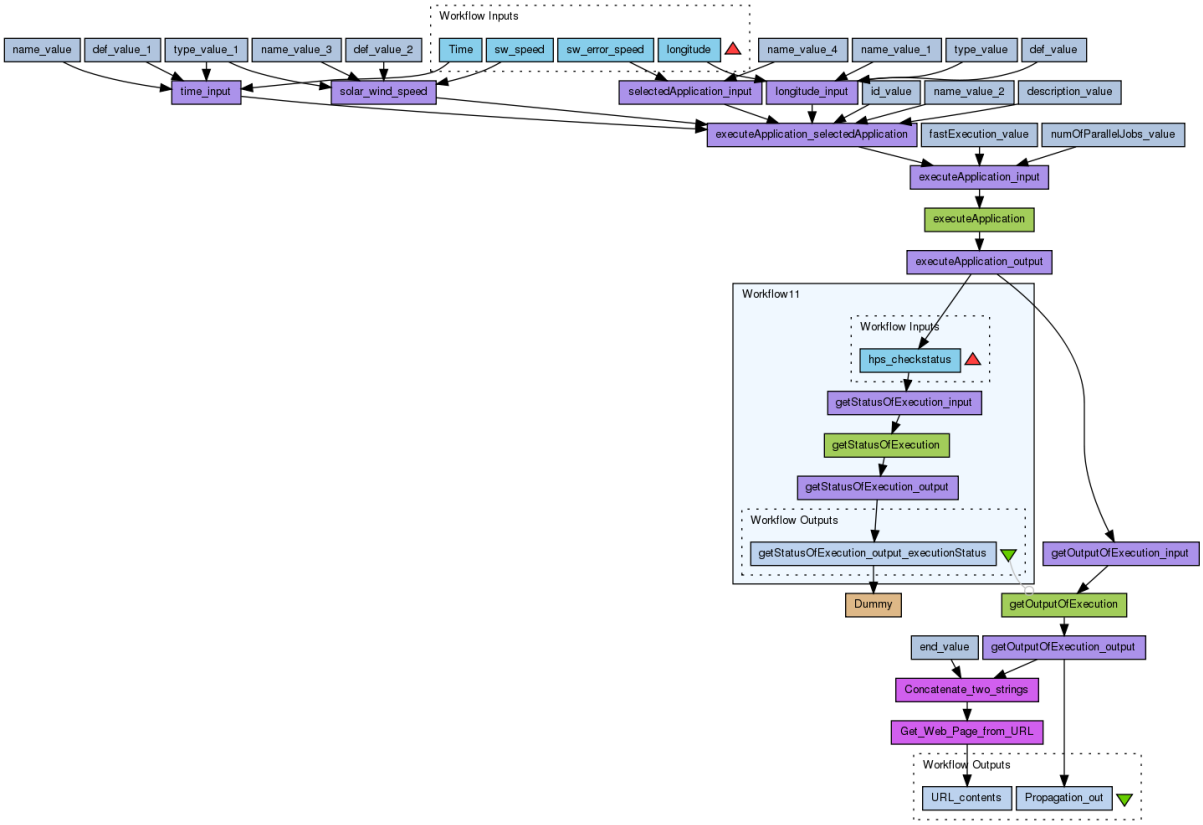

Figure 9, Taverna Workflow for the Remote SEP Forward Propagation Model

5.2.6.3 Software Details

Name	Description	Reference
HELIO Processing Service (HPS)	HELIO Processing Service	
SHEBA	Propagation Model	https://github.com/dpshelio/SHEBA/blob/master/documentation/sheba.org
VOTABLE	XML format for astrophysics and heliophysics data	http://www.ivoa.net/documents/VOTable/

Table 17, Software Details of the Remote SEP Forward Propagation Model

5.2.6.4 Input/Output

Input Data

Date : YYYY-MM-DD"T"HH:MM:ss	Every valid date
Speed : String	A positive integer
Error Speed : String	A positive integer
Longitude : String	A positive integer
Beta: String	From 0 to 1 (Fraction of the speed of light)

Output Data

URL: String	The URL of the stored results
VoTable: VoTable	VoTable with the expected arrival times

5.2.6.5 Further Technical Details

Information	URL
SHIWA Repository	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/public/edit-application.xhtml?appid=5760
Application description template	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5760&filename=RemoteSEPForwardPropagation.Taverna.pdf
User documentation	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5760&filename=RemoteSEPForwardPropagation.Taverna.pdf
Software documentation	https://github.com/dpshelio/SHEBA/blob/master/documentation/sheba.org
Contact details	Gabriele Pierantoni – pierang@cs.tcd.ie

Table 18, Technical Details of the Remote SEP Forward Propagation Model

5.2.7 Remote SEP Backward Propagation

5.2.7.1 Nature and Relevance

This workflow calculates the backward propagation of a Co-Rotating Interactive Region (CIR) from the outer bodies of Solar System back to the Sun. It invokes the SHEBA propagation model that is executed remotely on a web service that exposes the HELIO Processing Service interface.

5.2.7.2 Workflow Details

This workflow takes as input the details of the CME and the body that was hit by the CME and returns the Expected Times at Arrival at the Sun.

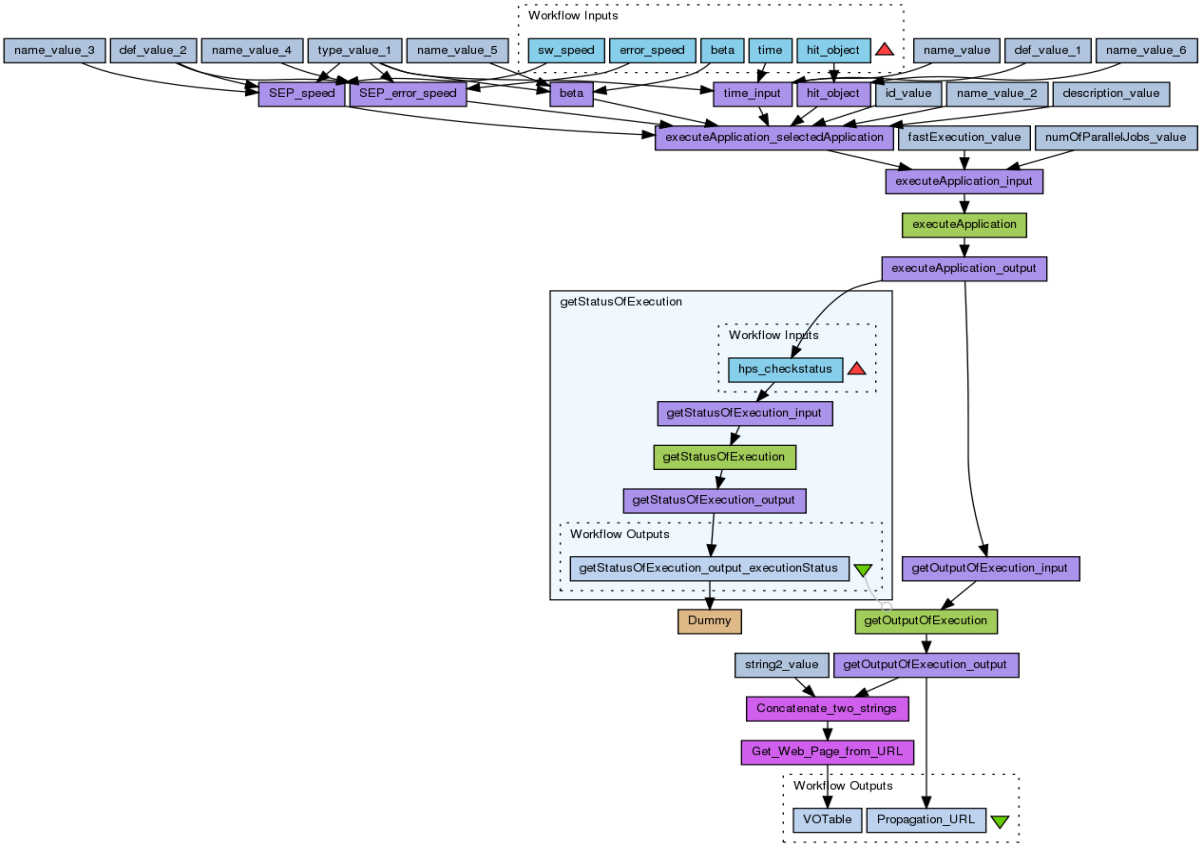

Figure 10, Taverna Workflow for the Remote SEP Backward Propagation Model

5.2.7.3 Software Details

Name	Description	Reference
HELIO Processing Service (HPS)	HELIO Processing Service	
SHEBA	Propagation Model	https://github.com/dpshelio/SHEBA/blob/master/documentation/sheba.org
VOTABLE	XML format for astrophysics and heliophysics data	http://www.ivoa.net/documents/VOTable/

Table 19, Software Details of the Remote SEP Backward Propagation Model

5.2.7.4 Input/Output

Input Data

Date : YYYY-MM-DD"T"HH:MM:ss	Every valid date
Speed : String	A positive integer
Error Speed : String	A positive integer
Hit Object : String	A positive integer
Beta: String	From 0 to 1 (Fraction of the speed of light)

Output Data

URL: String	The URL of the stored results
VoTable: VoTable	VoTable with the expected arrival times

5.2.7.5 Further Technical Details

Information	URL
SHIWA Repository	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/public/edit-application.xhtml?appid=5762
Application description template	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5762&filename=RemoteSEPBackwardPropagation.Taverna.pdf
User documentation	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5762&filename=RemoteSEPBackwardPropagation.Taverna.pdf
Software documentation	https://github.com/dpshelio/SHEBA/blob/master/documentation/sheba.org
Contact details	Gabriele Pierantoni – pierang@cs.tcd.ie

Table 20, Technical Details of the Remote CME Forward Propagation Model

5.2.8 Local CME Forward Propagation

5.2.8.1 Nature and Relevance

This workflow calculates the forward propagation of a Coronal Mass Ejection (CME) from the Sun to the outer bodies of the Solar System. It invokes the SHEBA propagation model that is executed locally.

5.2.8.2 Workflow Details

This workflow takes as input the details of the CME and returns the Expected Times at Arrival (ETAs) for the various bodies of the Solar System.

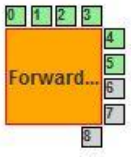

Figure 11, WS-PGRADE Workflow for the Remote CME Forward Propagation Model

5.2.8.3 Software Details

Name	Description	Reference
HELIO Processing Service (HPS)	HELIO Processing Service	
SHEBA	Propagation Model	https://github.com/dpshelio/SHEBA/blob/master/documentation/sheba.org
VOTABLE	XML format for astrophysics and heliophysics data	http://www.ivoa.net/documents/VOTable/

Table 21, Software Details of the Remote CME Forward Propagation Model

5.2.8.4 Input/Output

Input Data

Date : YYYY-MM-DD"T"HH:MM:ss	Every valid date
Width : String	From 0 to 360 degrees – defaults to 45
Speed : String	A positive integer
Error Speed : String	A positive integer – defaults to 10
Longitude : String	A positive integer
Output Directory: String	Any acceptable Linux Complete File Path – defaults to output-dir

Output Data

CompleteOutput: Zip file	The zip file with the complete output (with images).
VoTable: VoTable	The VoTable with the Expected Arrival Times
HttpdAddress: String	The URL of the stored results

5.2.8.5 Further Technical Details

Information	URL
SHIWA Repository	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/public/edit-application.xhtml?appid=5765
Application description template	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5765&filename=LocalCMEForwardPropagation.WSPGRADE.pdf
User documentation	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5765&filename=LocalCMEForwardPropagation.WSPGRADE.pdf
Software documentation	https://github.com/dpshelio/SHEBA/blob/master/documentation/sheba.org
Contact details	Gabriele Pierantoni – pierang@cs.tcd.ie

Table 22, Technical Details of the Remote CME Forward Propagation Model

5.2.9 Local CME Backward Propagation

5.2.9.1 Nature and Relevance

This workflow calculates the backward propagation of a Coronal Mass Ejection (CME) from the outer bodies of Solar System back to the Sun. It invokes the SHEBA propagation model that is executed on a local infrastructure.

5.2.9.2 Workflow Details

This workflow takes as input the details of the CME and the body that was hit by the CME and returns the Expected Times at Arrival at the Sun.

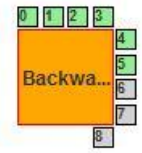

Figure 12, Taverna Workflow for the Remote CME Backward Propagation Model

5.2.9.3 Software Details

Name	Description	Reference
HELIO Processing Service (HPS)	HELIO Processing Service	
SHEBA	Propagation Model	https://github.com/dpshelio/SHEBA/blob/master/documentation/sheba.org
VOTABLE	XML format for astrophysics and heliophysics data	http://www.ivoa.net/documents/VOTable/

Table 23, Software Details of the Remote CME Forward Propagation Model

5.2.9.4 Input/Output

Input Data

Date : YYYY-MM-DD"T"HH:MM:ss	Every valid date
Width : String	From 0 to 360 degrees
Speed : String	Positive Integer
Error Speed : String	Positive Integer – defaults to 10
Hit Object : String	A String among: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto, Cassini, Dawn, Galileo, Messenger, New Horizons, Rosetta, STEREO A, STEREO B, Ulysses, Voyager A, Voyager B.
Output Directory: String	Any acceptable Linux Complete File Path – defaults to output-dir

Output Data

CompleteOutput: Zip file	The zip file with the complete output (with images).
VoTable: VoTable	The VoTable with the Expected Arrival Times
HttpdAddress: String	The URL of the stored results

5.2.9.5 Further Technical Details

Information	URL
SHIWA Repository	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/public/edit-application.xhtml?appid=5764
Application description template	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5764&filename=LocalCMEBackwardPropagation.WSPGRADE.pdf
User documentation	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5764&filename=LocalCMEBackwardPropagation.WSPGRADE.pdf
Software documentation	https://github.com/dpshelio/SHEBA/blob/master/documentation/sheba.org
Contact details	Gabriele Pierantoni – pierang@cs.tcd.ie

Table 24, Technical Details of the Remote CME Forward Propagation Model

5.2.10 Local CIR Forward Propagation

5.2.10.1 Nature and Relevance

This workflow calculates the forward propagation of a Co-rotating Interactive Region (CIR) from the Sun to the outer bodies of the Solar System. It invokes the SHEBA propagation model that is executed on a local infrastructure

5.2.10.2 Workflow Details

This workflow takes as input the details of the CIR and returns the Expected Times at Arrival (ETAs) for the various bodies of the Solar System.

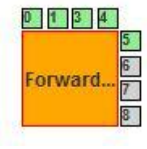

Figure 13, Taverna Workflow for the Local CIR Forward Propagation Model

5.2.10.3 Software Details

Name	Description	Reference
HELIO Processing Service (HPS)	HELIO Processing Service	
SHEBA	Propagation Model	https://github.com/dpshelio/SHEBA/blob/master/documentation/sheba.org
VOTABLE	XML format for astrophysics and heliophysics data	http://www.ivoa.net/documents/VOTable/

Table 25, Software Details of the Local CIR Forward Propagation Model

5.2.10.4 Input/Output

Input Data

Date : YYYY-MM-DD"T"HH:MM:ss	Every valid date
Speed : String	A positive integer
Error Speed : String	A positive integer
Hit Object : String	A positive integer
Beta: String	From 0 to 1 (Fraction of the speed of light)
Output Directory: String	Any acceptable Linux Complete File Path – defaults to output-dir

Output Data

CompleteOutput: Zip file	The zip file with the complete output (with images).
VoTable: VoTable	The VoTable with the Expected Arrival Times
HttpdAddress: String	The URL of the stored results

5.2.10.5 Further Technical Details

Information	URL
SHIWA Repository	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/public/edit-application.xhtml?appid=5766
Application description template	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5766&filename=LocalCIRForwardPropagation.WSPGRADE.pdf
User documentation	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5766&filename=LocalCIRForwardPropagation.WSPGRADE.pdf
Software documentation	https://github.com/dpshelio/SHEBA/blob/master/documentation/sheba.org
Contact details	Gabriele Pierantoni – pierang@cs.tcd.ie

Table 26, Technical Details of the Local CIR Forward Propagation Model

5.2.11 Local CIR Backward Propagation

5.2.11.1 Nature and Relevance

This workflow calculates the backward propagation of a Co-Rotating Interactive Region from the outer bodies of Solar System back to the Sun. It invokes the SHEBA propagation model that is executed on a local infrastructure.

5.2.11.2 Workflow Details

This workflow takes as input the details of the CIR and the body that was hit by the CIR and returns the Expected Times at Arrival at the Sun.

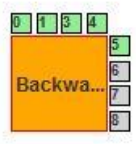

Figure 14, Taverna Workflow for the Remote CIR Backward Propagation Model

5.2.11.3 Software Details

Name	Description	Reference
HELIO Processing Service (HPS)	HELIO Processing Service	
SHEBA	Propagation Model	https://github.com/dpshelio/SHEBA/blob/master/documentation/sheba.org
VOTABLE	XML format for astrophysics and heliophysics data	http://www.ivoa.net/documents/VOTable/

Table 27, Software Details of the Remote CIR Forward Propagation Model

5.2.11.4 Input/Output

Input Data

Date : YYYY-MM-DD"T"HH:MM:ss	Every valid date
Speed : String	A positive integer
Error Speed : String	A positive integer
Hit Object : String	A positive integer
Beta: String	From 0 to 1 (Fraction of the speed of light)
Output Directory: String	Any acceptable Linux Complete File Path – defaults to output-dir

Output Data

CompleteOutput: Zip file	The zip file with the complete output (with images).
VoTable: VoTable	The VoTable with the Expected Arrival Times
HttpdAddress: String	The URL of the stored results

5.2.11.5 Further Technical Details

Information	URL
SHIWA Repository	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/public/edit-application.xhtml?appid=5767
Application description template	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5767&filename=LocalCIRBackwardPropagation.WSPGRADE.pdf
User documentation	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5767&filename=LocalCIRBackwardPropagation.WSPGRADE.pdf
Software documentation	https://github.com/dpshelio/SHEBA/blob/master/documentation/sheba.org
Contact details	Gabriele Pierantoni – pierang@cs.tcd.ie

Table 28, Technical Details of the Remote CME Forward Propagation Model

5.2.12 Local SEP Forward Propagation

5.2.12.1 Nature and Relevance

This workflow calculates the forward propagation of a Solar Energetic Particle (SEP) from the Sun to the outer bodies of the Solar System. It invokes the SHEBA propagation model that is executed on a local infrastructure.

5.2.12.2 Workflow Details

This workflow takes as input the details of the CIR and returns the Expected Times at Arrival (ETAs) for the various bodies of the Solar System.

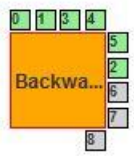

Figure 15, Taverna Workflow for the Local SEP Forward Propagation Model

5.2.12.3 Software Details

Name	Description	Reference
HELIO Processing Service (HPS)	HELIO Processing Service	
SHEBA	Propagation Model	https://github.com/dpshelio/SHEBA/blob/master/documentation/sheba.org
VOTABLE	XML format for astrophysics and heliophysics data	http://www.ivoa.net/documents/VOTable/

Table 29, Software Details of the Remote CIR Forward Propagation Model

5.2.12.4 Input/Output

Input Data

Date : YYYY-MM-DD"T"HH:MM:ss	Every valid date
Speed : String	A positive integer
Error Speed : String	A positive integer
Longitude : String	A positive integer
Beta: String	From 0 to 1 (Fraction of the speed of light)
Output Directory: String	Any acceptable Linux Complete File Path – defaults to output-dir

Output Data

CompleteOutput: Zip file	The zip file with the complete output (with images).
VoTable: VoTable	The VoTable with the Expected Arrival Times
HttpdAddress: String	The URL of the stored results

5.2.12.5 Further Technical Details

Information	URL
SHIWA Repository	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/public/edit-application.xhtml?appid=5769
Application description template	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5769&filename=LocalSEPBackwardPropagation.WSPGRADE.pdf
User documentation	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5769&filename=LocalSEPBackwardPropagation.WSPGRADE.pdf
Software documentation	https://github.com/dpshelio/SHEBA/blob/master/documentation/sheba.org
Contact details	Gabriele Pierantoni – pierang@cs.tcd.ie

Table 30, Technical Details of the Local SEP Forward Propagation Model

5.2.13 Local SEP Backward Propagation

5.2.13.1 Nature and Relevance

This workflow calculates the backward propagation of a Co-Rotating Interactive Region (CIR) from the outer bodies of Solar System back to the Sun. It invokes the SHEBA propagation model that is executed remotely on a web service that exposes the HELIO Processing Service interface.

5.2.13.2 Workflow Details

This workflow takes as input the details of the CME and the body that was hit by the CME and returns the Expected Times at Arrival at the Sun.

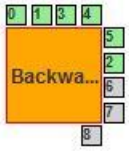

Figure 16, WSPGRADE Workflow for the Local SEP Backward Propagation Model

5.2.13.3 Software Details

Name	Description	Reference
HELIO Processing Service (HPS)	HELIO Processing Service	
SHEBA	Propagation Model	https://github.com/dpshelio/SHEBA/blob/master/documentation/sheba.org
VOTABLE	XML format for astrophysics and heliophysics data	http://www.ivoa.net/documents/VOTable/

Table 31, Software Details of the Remote CIR Backward Propagation Model

5.2.13.4 Input/Output

Input Data

Date : YYYY-MM-DD"T"HH:MM:ss	Every valid date
Speed : String	A positive integer
Error Speed : String	A positive integer
Hit Object : String	A String among: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto, Cassini, Dawn, Galileo, Messenger, New Horizons, Rosetta, STEREO A, STEREO B, Ulysses, Voyager A, Voyager B.
Beta: String	From 0 to 1 (Fraction of the speed of light)
Output Directory: String	Any acceptable Linux Complete File Path – defaults to output-dir

Output Data

CompleteOutput: Zip file	The zip file with the complete output (with

	images).
VoTable: VoTable	The VoTable with the Expected Arrival Times
HttpdAddress: String	The URL of the stored results

5.2.13.5 Further Technical Details

Information	URL
SHIWA Repository	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/public/edit-application.xhtml?appid=5769
Application description template	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5769&filename=LocalSEPBackwardPropagation.WSPGRADE.pdf
User documentation	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5769&filename=LocalSEPBackwardPropagation.WSPGRADE.pdf
Software documentation	https://github.com/dpshelio/SHEBA/blob/master/documentation/sheba.org
Contact details	Gabriele Pierantoni – pierang@cs.tcd.ie

Table 32, Technical Details of the Remote CME Forward Propagation Model

5.2.14 VoTableExtractor

5.2.14.1 Nature and Relevance

Extracts content of columns from a VoTable by Parsing the xml file to produce a list of the desired parameters. It is a very useful building block as VoTable extraction is a very common operation in Heliophysics

5.2.14.2 Workflow Details

This workflow takes as input a VoTable and the list of arguments to extract and returns two lists, one with the names of the values and one with the values.

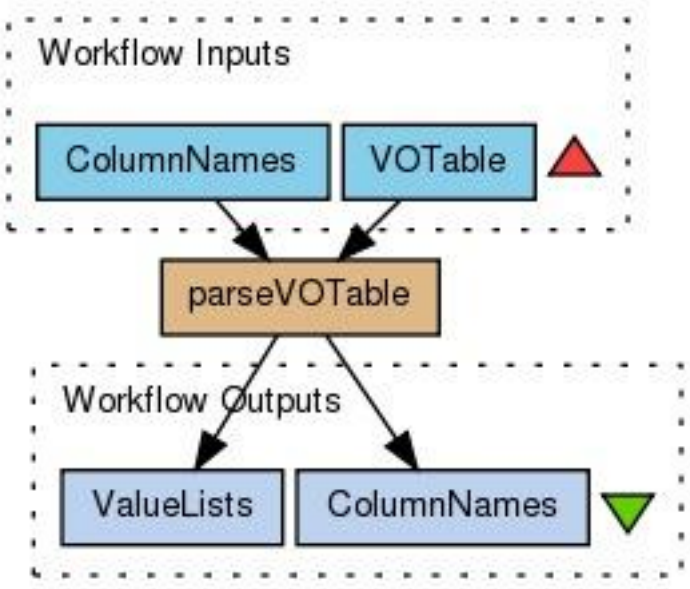

Figure 17, Taverna Workflow for the extraction of values from a VoTable

5.2.14.3 Software Details

Name	Description	Reference
VOTABLE	XML format for astrophysics and heliophysics data	http://www.ivoa.net/documents/VOTable/

Table 33, Software Details for the extraction of values from a VoTable

5.2.14.4 Input/Output

Input Data

VoTable: VoTable	The VoTable to be parsed
ColumNames : List of String	List of Strings with Column names of the VOTable

Output Data

ColumNames : List of String	Column names - in the order of the value list
ValueLists : Lists of String	The VoTable with the Expected Arrival Times

5.2.14.5 Further Technical Details

Information	URL
SHIWA Repository	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/public/edit-application.xhtml?appid=5772
Application description template	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5772&filename=VoTableExtractor.Taverna.pdf
User documentation	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5772&filename=VoTableExtractor.Taverna.pdf
Software documentation	http://www.ivoa.net/documents/VOTable/
Contact details	Gabriele Pierantoni – pierang@cs.tcd.ie

Table 34, Technical Details for the extraction of values from a VoTable

5.2.15 HECQueryWhatParam

5.2.15.1 Nature and Relevance

A simple query of the Helio Event Catalogue (http://msslkz.mssl.ucl.ac.uk/helio_hec/HelioTavernaService?wsdl), a web service developed by the HELIO project that holds a catalogue with a list of events.

5.2.15.2 Workflow Details

User can enter catalogue name, time start, time end and desired paramter(s), the workflow returns the votable with the desired query.

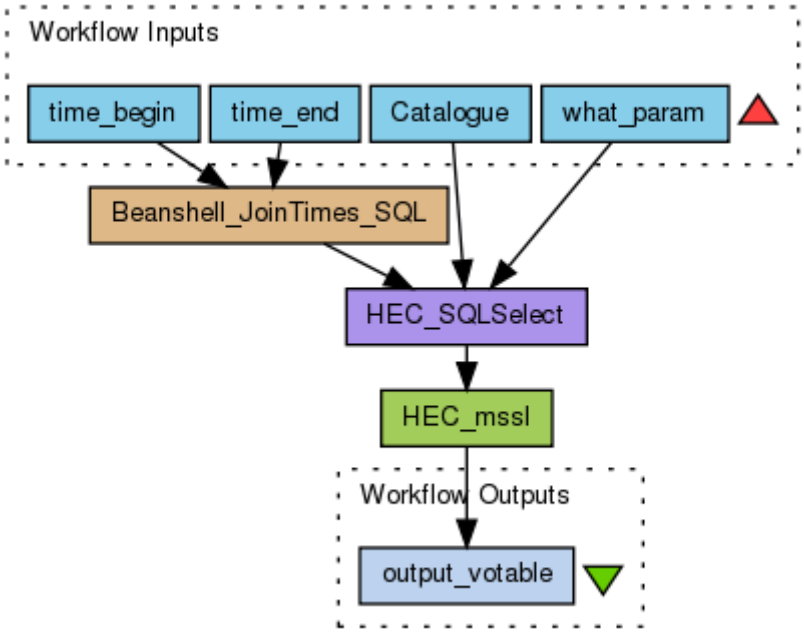

Figure 18, Taverna Workflow for the simple HEC Query

Name	Description	Reference
VOTABLE	XML format for astrophysics and heliophysics data	http://www.ivoa.net/documents/VOTable/
HEC	HELIO Event Catalogue	http://hec.helio-vo.eu/hec/hec_gui.php

Table 35, Software Details for Input/Output

5.2.15.3 Input/Output

Input Data

time_begin – String	Start time
time_end – String	End time
Catalogue – String	Catalogue in the HEC

what_param – String	The what mysql clause

Output Data

output_votable - String	The VoTable returned

5.2.15.4 Further Technical Details

Information	URL
SHIWA Repository	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/public/edit-application.xhtml?appid=5773
Application description template	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5773&filename=HECQueryWhatParam.Taverna.pdf
User documentation	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5773&filename=HECQueryWhatParam.Taverna.pdf
Software documentation	http://hec.helio-vo.eu/hec/hec_gui.php
Contact details	Gabriele Pierantoni – pierang@cs.tcd.ie

Table 36, Technical Details of the extraction of values from a VoTable

5.2.17 HECQueryOrdered

5.2.17.1 Nature and Relevance

A query of the Helio Event Catalogue, a web service developed by the HELIO project that holds a catalogue with a list of events.

5.2.17.2 Workflow Details

User can enter catalogue name, time start, time end, the desired parameter, parameter to order by, and limit on the search result.

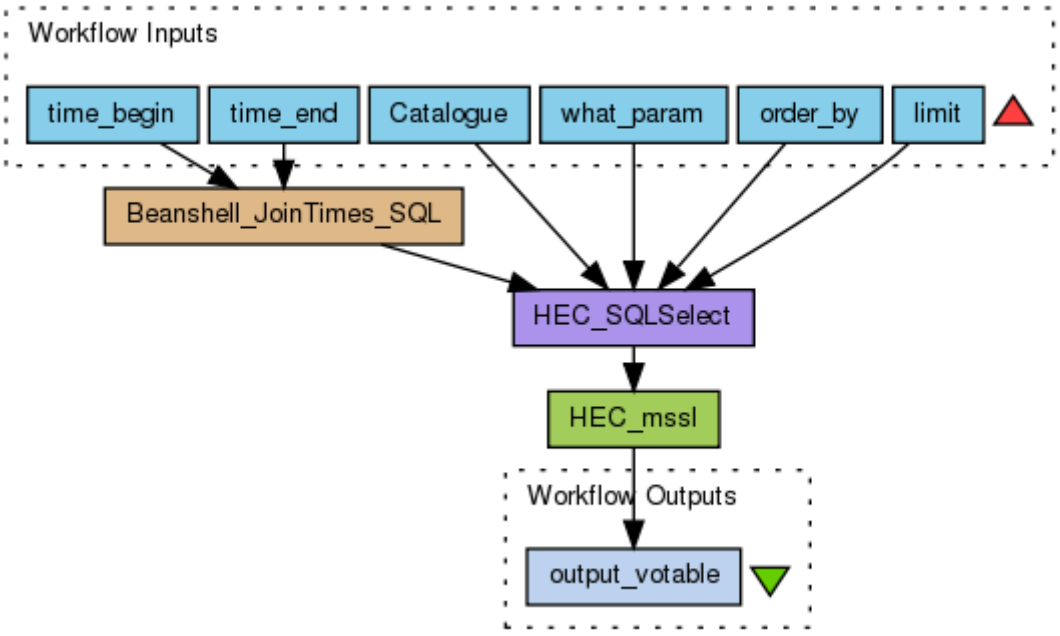

Figure 19, Taverna Workflow for the ordered HEC Query

Name	Description	Reference
VOTABLE	XML format for astrophysics and heliophysics data	http://www.ivoa.net/documents/VOTable/
HEC	HELIO Event Catalogue	http://hec.helio-vo.eu/hec/hec_gui.php

Table 37, Software Details for the ordered HEC Query

5.2.17.3 Input/Output

Input Data

time_begin – String	Start time
time_end – String	End time
Catalogue – String	Catalogue in the HEC
what_param – String	The what mysql clause
	Paramater to order list by

order_by – String	
Limit - String	Limit the search result to this number of entries

Output Data

output_votable - String	The VoTable returned

5.2.17.4 Further Technical Details

Information	URL
SHIWA Repository	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/public/edit-application.xhtml?appid=5774
Application description template	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5774&filename=HECQueryOrdered.Taverna.pdf
User documentation	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5774&filename=HECQueryOrdered.Taverna.pdf
Software documentation	http://hec.helio-vo.eu/hec/hec_gui.php
Contact details	Gabriele Pierantoni – pierang@cs.tcd.ie

Table 38, Technical Details of the extraction of values from a VoTable

5.2.18 HECQuerySimple

5.2.18.1 Nature and Relevance

A simple query of the Helio Event Catalogue (http://msslkz.mssl.ucl.ac.uk/helio_hec/HelioTavernaService?wsdl), a web service developed by the HELIO project that holds a catalogue with a list of events.

5.2.18.2 Workflow Details

User can enter catalogue name, time start, time end, the workflow returns the votable with the desired query.

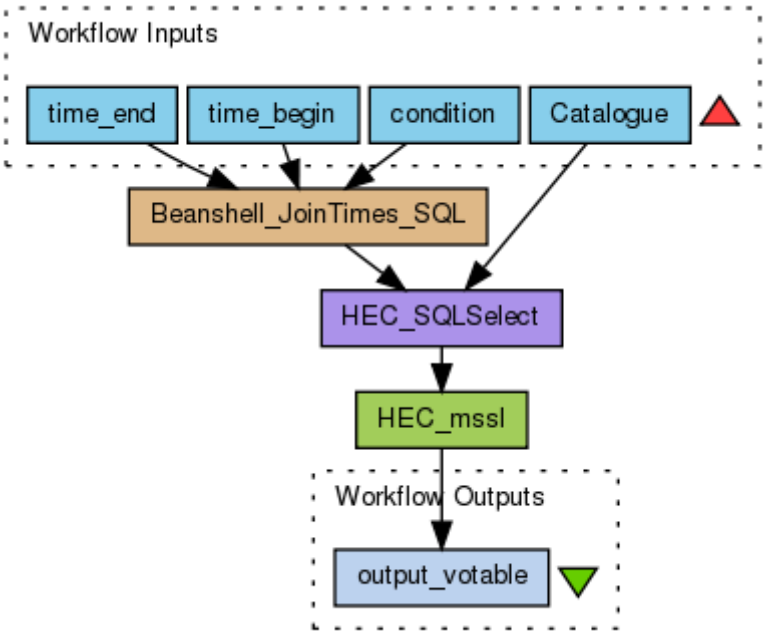

Figure 20, Taverna Workflow for the simple HEC Query

Name	Description	Reference
VOTABLE	XML format for astrophysics and heliophysics data	http://www.ivoa.net/documents/VOTable/
HEC	HELIO Event Catalogue	http://hec.helio-vo.eu/hec/hec_gui.php

Table 39, Software Details for Input/Output

5.2.18.3 Input/Output

Input Data

time_begin – String	Start time
time_end – String	End time
Catalogue – String	Catalogue in the HEC

Output Data

output_votable - String	The VoTable returned

5.2.18.4 Further Technical Details

Information	URL
SHIWA Repository	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/public/edit-application.xhtml?appid=5775
Application description template	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5775&filename=HECQuerySimple.Taverna.docx
User documentation	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5775&filename=HECQuerySimple.Taverna.docx
Software documentation	http://hec.helio-vo.eu/hec/hec_gui.php
Contact details	Gabriele Pierantoni – pierang@cs.tcd.ie

Table 40, Technical Details of the extraction of values from a VoTable

5.2.19 HECQueryWSPGRADE

5.2.19.1 Nature and Relevance

A simple query of the Helio Event Catalogue (http://msslkz.mssl.ucl.ac.uk/helio_hec/HelioTavernaService?wsdl), using the wget interface directly in WS-PGRADE.

5.2.19.2 Workflow Details

User can enter catalogue name, time start, time end, the workflow returns the votable with the desired query.

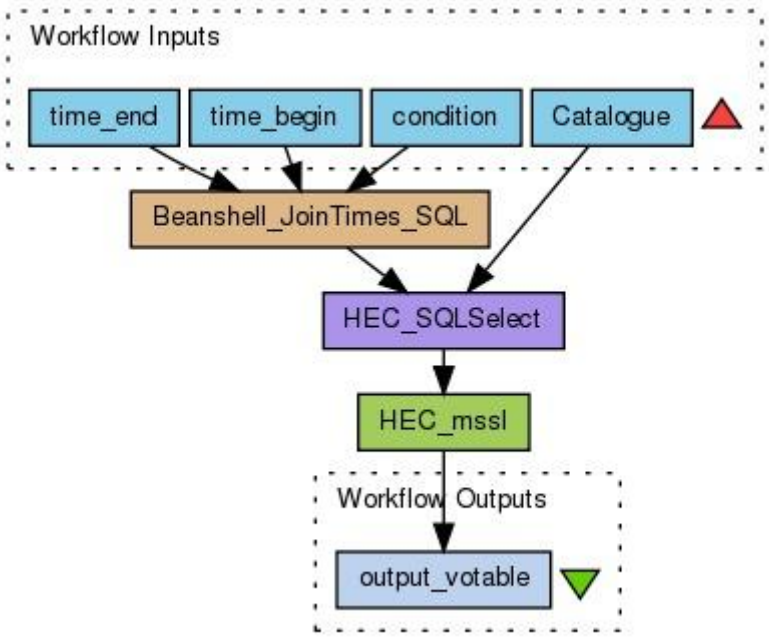

Figure 21, Taverna Workflow for the simple HEC Query

Name	Description	Reference
VOTABLE	XML format for astrophysics and heliophysics data	http://www.ivoa.net/documents/VOTable/
HEC	HELIO Event Catalogue	http://hec.helio-vo.eu/hec/hec_gui.php

Table 41, Software Details for simple HEC Query

5.2.19.3 Input/Output

Input Data

time_begin – String	Start time – No default, if not set script aborts
time_end – String	End time – No default, if not set script aborts
Catalogue – String	Catalogue in the HEC – No default, if not set script aborts
Service – String	The service to be used – defaults to

	http://hec.helio-vo.eu/hec
VoTableName – String	The name of the votable file to be used. Has to match with the concrete workflows specifications – defaults to `hec_query.votable`

Output Data

output_votable - String	The VoTable returned

5.2.19.4 Further Technical Details

Information	URL
SHIWA Repository	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/public/edit-application.xhtml?appid=5741
Application description template	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5741&filename=HECQuerySimple.WSPGRADE.pdf
User documentation	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5741&filename=HECQuerySimple.WSPGRADE.pdf
Software documentation	http://hec.helio-vo.eu/hec/hec_gui.php
Contact details	Gabriele Pierantoni – pierang@cs.tcd.ie

Table 42, Technical Details of simple HEC Query

5.2.20 HFCQuery

5.2.20.1 Nature and Relevance

Invocation of the helio feature catalogue (HFC - http://voparis-helio.obspm.fr/hfc-gui/index.php) using the service located at Paris Observatory.

5.2.20.2 Workflow Details

User can enter catalogue name, time start, time end, the workflow returns the votable with the desired query.

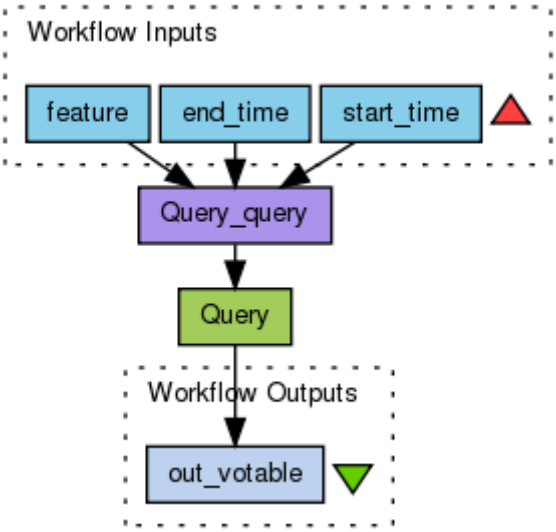

Figure 22, Taverna Workflow for the HFC Query

Name	Description	Reference
VOTABLE	XML format for astrophysics and heliophysics data	http://www.ivoa.net/documents/VOTable/
HFC	HELIO Feature Catalogue	http://voparis-helio.obspm.fr/

Table 43, Software Details for Input/Output

5.2.20.3 Input/Output

Input Data

time_begin – String	Start time
time_end – String	End time
Feature – String	Feature in the HFC

Output Data

output_votable - String	The VoTable returned

Sample Data

time_begin	2001-01-01T00:00:00
time_end	2001-01-02T00:00:00
Feature	Filament

5.2.20.4 Further Technical Details

Information	URL
SHIWA Repository	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/public/edit-application.xhtml?appid=5776
Application description template	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5776&filename=HFCQuerySimple.Taverna.pdf
User documentation	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5776&filename=HFCQuerySimple.Taverna.pdf
Software documentation	http://voparis-helio.obspm.fr/
Contact details	Gabriele Pierantoni – pierang@cs.tcd.ie

Table 44, Technical Details of the extraction of values from a VoTable

5.2.21 HFCVoTableQuery

5.2.21.1 Nature and Relevance

Invocation of the helio feature catalogue (HFC - http://voparis-helio.obspm.fr/hfc-gui/index.php) using the service located at Paris Observatory.

5.2.21.2 Workflow Details

This workflow uses the wget interface and it is a native WS-PGRADE workflow. It returns a votable with the details of the requested feature.

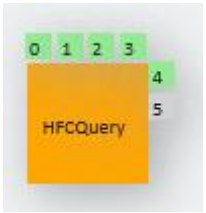

Figure 23, Taverna Workflow for the HFC VoTable Query

Name	Description	Reference
VOTABLE	XML format for astrophysics and heliophysics data	http://www.ivoa.net/documents/VOTable/
HFC	HELIO Feature Catalogue	http://voparis-helio.obspm.fr/

Table 45, Software Details for Input/Output

5.2.21.3 Input/Output

Input Data

time_begin – String	Start time
time_end – String	End time
Feature – String	Feature in the HFC
Service – String	The service to be used. – Defaults to http://voparis-helio.obspm.fr:8080

Output Data

output_votable - String	The VoTable returned

5.2.21.4 Further Technical Details

Information	URL
SHIWA Repository	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/public/edit-application.xhtml?appid=5784
Application description	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5784&filename=HFCVoTableQuery.WSPGRADE.pdf

template	
User documentation	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5784&filename=HFCVoTableQuery.WSPGRADE.pdf
Software documentation	http://voparis-helio.obspm.fr/
Contact details	Gabriele Pierantoni – pierang@cs.tcd.ie

Table 46, Technical Details of the extraction of values from a VoTable

5.2.22 HFCImageQuery

5.2.22.1 Nature and Relevance

Invocation of the helio feature catalogue (HFC - http://voparis-helio.obspm.fr/hfc-gui/index.php) using the service located at Paris Observatory.

5.2.22.2 Workflow Details

This workflow uses the wget interface and it is a native WS-PGRADE workflow. It returns a votable with the details of the requested feature.

Figure 24, Taverna Workflow for the HFC Image Query

Name	Description	Reference
VOTABLE	XML format for astrophysics and heliophysics data	http://www.ivoa.net/documents/VOTable/
HFC	HELIO Feature Catalogue	http://voparis-helio.obspm.fr/

Table 47, Software Details for the HFC Image Query

5.2.22.3 Input/Output

Input Data

time_begin – String	Start time
time_end – String	End time
Feature – String	Feature in the HFC

Output Data

output_votable - String	The VoTable returned

Sample Data

time_begin	2001-01-01T00:00:00
time_end	2001-01-02T00:00:00
Feature	Filament

5.2.22.4 Further Technical Details

Information	URL
SHIWA Repository	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/public/edit-application.xhtml?appid=5783
Application description template	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5783&filename=HFCImageQuery.WSPGRADE.pdf
User documentation	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5783&filename=HFCImageQuery.WSPGRADE.pdf
Software documentation	
Contact details	Gabriele Pierantoni – pierang@cs.tcd.ie

Table 48, Technical Details of the extraction of values from a VoTable

5.2.23 ICSQuery

5.2.23.1 Nature and Relevance

Simple invocation of the instrument capability service (ICS - http://www.helio-vo.eu/services/interfaces/helio-ics_uix.php). Also shows what tables and table fields are available for searching.

5.2.23.2 Workflow Details

Also shows what tables and table fields are available for searching.

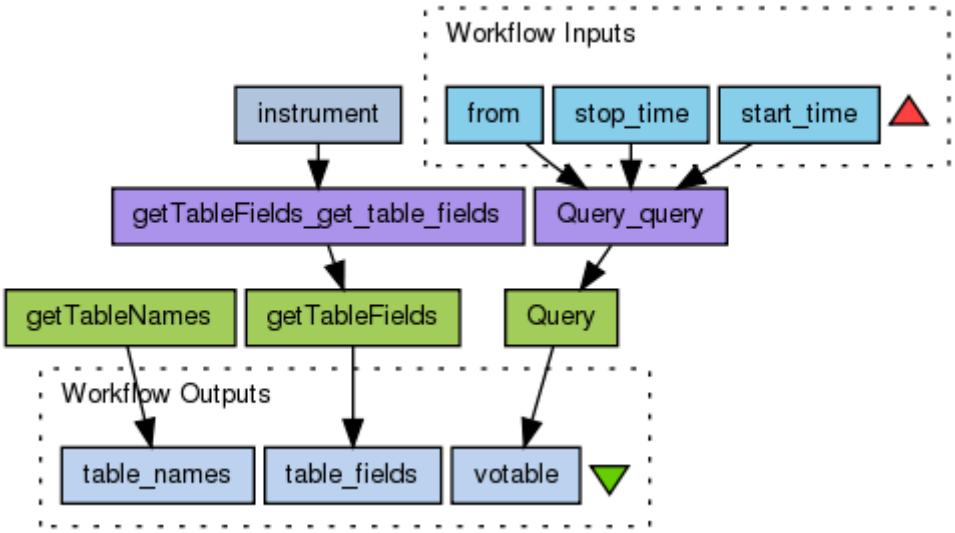

Figure 25, Taverna Workflow for the simple ICS Query

Name	Description	Reference
VOTABLE	XML format for astrophysics and heliophysics data	http://www.ivoa.net/documents/VOTable/
ICS	HELIO Instrument Capability Service	http://www.helio-vo.eu/services/interfaces/helio-ics_uix.php

Table 49, Software Details for the ICS Query

5.2.23.3 Input/Output

Input Data

start_time – String	Start time
stop_time – String	End time
From - String	The table to be queried

Output Data

Table_names – String	All the names of the available tables
Field_names – String	All the fields of the available tables
VoTable	The table to be queried

5.2.23.4 Further Technical Details

Information	URL
SHIWA Repository	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/public/edit-application.xhtml?appid=5777
Application description template	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5777&filename=ICSQuery.Taverna.pdf
User documentation	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5777&filename=ICSQuery.Taverna.pdf
Software documentation	http://www.helio-vo.eu/services/interfaces/helio-ics_uix.php
Contact details	Gabriele Pierantoni – pierang@cs.tcd.ie

Table 50, Technical Details of the extraction ICS Query

5.2.24 ILSQuery

5.2.24.1 Nature and Relevance

Simple invocation of the instrument location service (ILS - http://www.helio-vo.eu/services/interfaces/helio-ils_uix.php).

5.2.24.2 Workflow Details

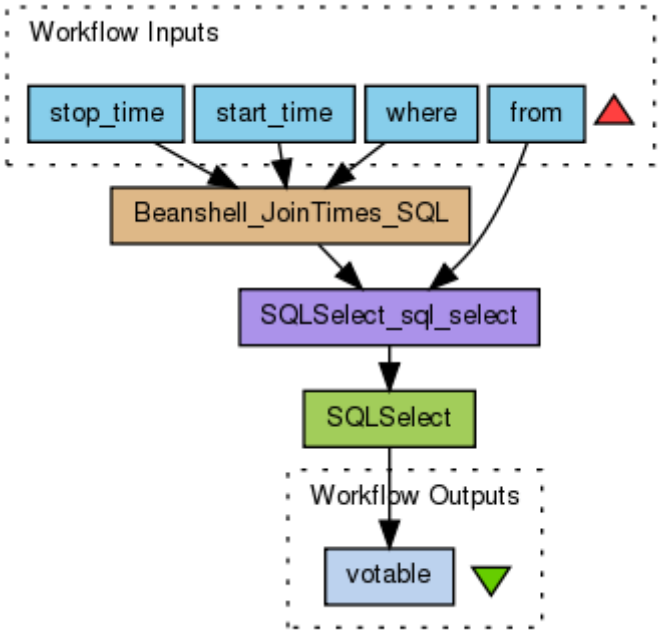

Figure 26, Taverna Workflow for the ILS Query

Name	Description	Reference
VOTABLE	XML format for astrophysics and heliophysics data	http://www.ivoa.net/documents/VOTable/
ILS	HELIO Instrument Location Service	http://www.helio-vo.eu/services/interfaces/helio-ics_uix.php

Table 51, Software Details for the simple HFC Query

5.2.24.3 Input/Output

Input Data

start_time – String	Start time
stop_time – String	End time
Where – String	MySql Query
From - String	The table to be queried

Output Data

VoTable	The results of the query

5.2.24.4 Further Technical Details

Information	URL
SHIWA Repository	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/public/edit-application.xhtml?appid=5777
Application description template	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5777&filename=ICSQuery.Taverna.pdf
User documentation	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5777&filename=ICSQuery.Taverna.pdf
Software documentation	http://www.helio-vo.eu/documents/service-guides/HELIO_UCL_S2_007_UM_ILS_User_Guide_v0.1.pdf
Contact details	Gabriele Pierantoni – pierang@cs.tcd.ie

Table 52, Technical Details of the extraction ICS Query

5.2.25 WindWavesQuickLook

5.2.25.1 Nature and Relevance

Returns the quicklook of the WindWaves Instrument

5.2.25.2 Workflow Details

Works with local beanshell to define the url of the quicklook, takes a list of parameters instead than separate parameters

5.2.25.3 Workflow Details

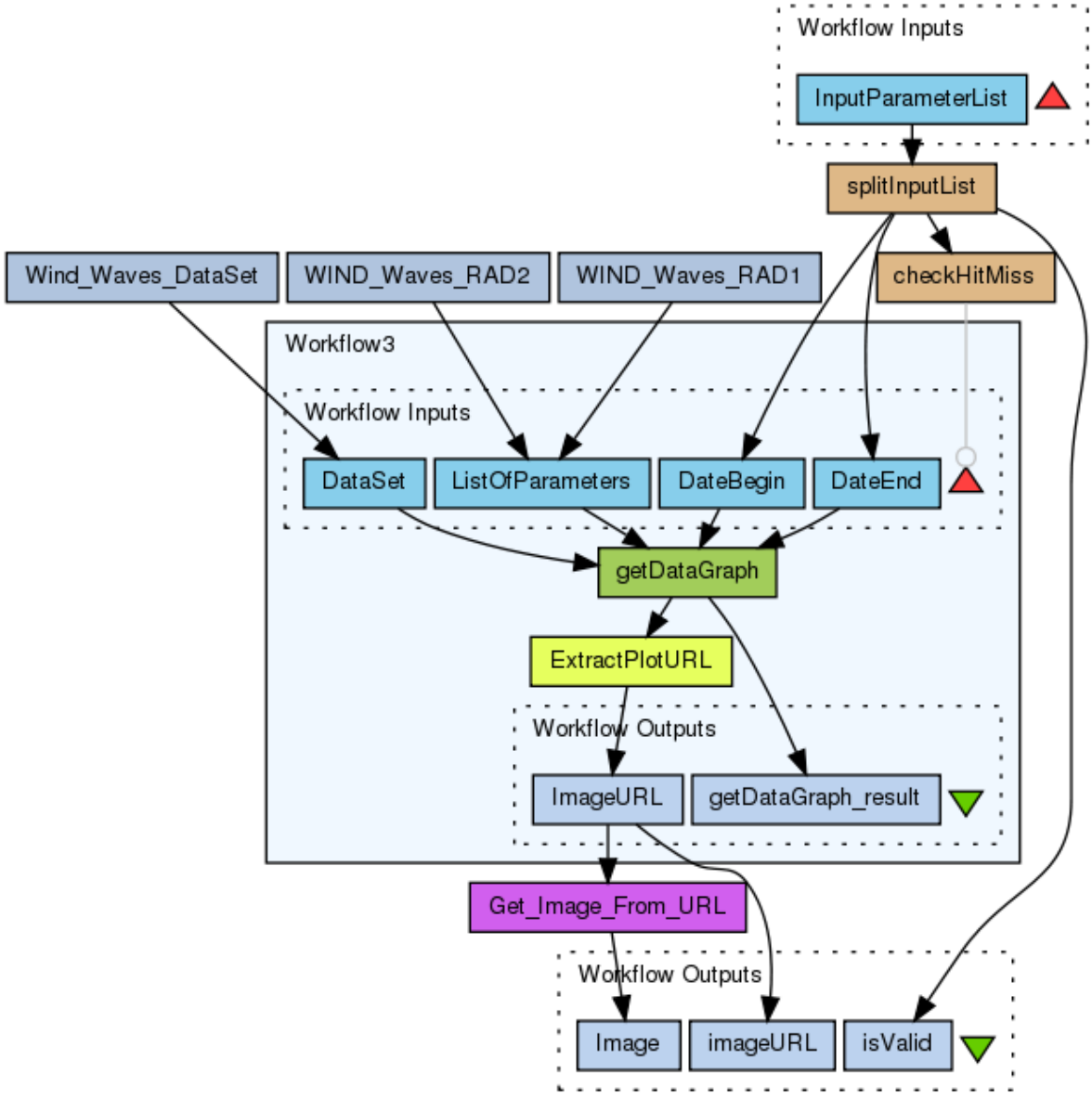

Figure 27, Taverna Workflow for WindWavesQuickLook

Name	Description	Reference
VOTABLE	XML format for astrophysics and heliophysics data	http://www.ivoa.net/documents/VOTable/
WindWaves	SECCHI Wind Waves Instrument	http://secchirh.obspm.fr/wind.php

Table 53, Software Details for WindWaves QuickLook

5.2.25.4 Input/Output

Input Data

ParameterList – List of strings	The list of parameters for the WindWaves query in the form (hit/miss, min expected arrival time, max expected arrival time)

Output Data

Image – Image	The Quicklook
ImageUrl – String	The urls of the image
isValid – Boolean	Returns false if WindWaves instrument was not hit by the event

5.2.25.5 Further Technical Details

Information	URL
SHIWA Repository	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/public/edit-application.xhtml?appid=5786
Application description template	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5786&filename=WindWavesQuickLook.Taverna.pdf
User documentation	http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/download?appid=5786&filename=WindWavesQuickLook.Taverna.pdf
Software documentation	http://secchirh.obspm.fr/wind.php
Contact details	Baptiste Cecconi Gabriele Pierantoni – pierang@cs.tcd.ie

Table 54, Technical Details of Workflow for WindWavesQuickLook