

# OIL & GAS / HOW TO...



The Petrel-Isatis link proves to be essential to the Petrel<sup>™</sup> user who wishes to fully benefit from Isatis powerful geostatistics for:

- Accurate data analysis and quality control with Isatis one-of-a-kind Exploratory Data Analysis tool.
- Structural modeling and uncertainty assessment guided by seismic.
- Facies modeling using simple or advanced stochastic simulations (including the Plurigaussian, multiple-point-statistics and process-based method as Flumy) to model complex geology.
- Petrophysical modeling and uncertainty assessment guided by the seismic and the geology.
- Uncertainty quantification: Isatis provides a unique range of stochastic simulation algorithms and post-processing tools to compute risk curves, P10-P50-P90 scenarios, as well as probability and quantile maps on volumes.

In Petrel you can find an Isatis link but you can also use all the processes of Isatis in Petrel workflows with a system command.



## 1. Isatis workflow

Isatis 2013.2 (WinNT64) [Study: test_liens_Petrel_Isatis]								
File	Tools	<u>S</u> tatistics	Interpolate	<u>D</u> isplay	Special	Batch & Workflows	Preference	s <u>H</u> elp
						<u>R</u> un Journal File	U TIME	
						Record Journal File	:00:00	isatis
Ready.			Edit Journal File	:00:00	2013			
						Condition Editor		
						Customized Workflow.		
						-		

### A. Customized workflow

→ Isatis → Batch & Workflows → Customized Workflow... → Workflow... → Univariate Kriging

Choose and write correct name of variable from Petrel and new variable. In this example variable 2, 3 and 5 have the same name in Petrel and Isatis.

i Custo	omized Workflow				
Workflow File Workflow Univariate Kriging					
	ł Items				
	#1 VariableDirectory_Name	export petrel			
	#2 VariableFile_Name	Wells (Logs)			
	#3 Variable_Name	Porosity			
	#4 GridDirectory_Name	Export petrel			
	#5 GridFile_Name	GEO Grid			
Jou	Journal File				
NEW Journal File D:\Etudes\Test_liens_Petrel_Isatis\JOURNAL\Kriging_Univariate.ijnl					
Save					



- B. Edit Journal File (optional step)
  - → Isatis → Edit Journal File... → Journal File... → Kriging\_Univariate.ijnl

Edit Journal File			
Journal File D:\Etudes\Test_liens_Petrel_Isatis\JOURNAL\Kriging_Univariate.ijnl	Reload Close		
List of Actions			
******			
++++++++++++++++++++++++++++++++++++++	New		
# Batch For Kriging #			
	Selection:		
" " " Isatis 2013 #	Transvé I		
	Exhant		
#	E(81 ]		
#			
*****	Duplicate		
%VAR VariableDirectory_Name = export petrel			
%VAR VariableFile_Name = Wells (Logs)	Delete		
%VAR Variable_Name = Porosity			
%VAR GridDirectory_Name = export petrel			
%VAR GridFile_Name = GEO Grid			
<pre>%REDIRECT MSG D:\Etudes\Test_liens_Petrel_Isatis\JOURNAL\Kriging_Univariate.txt</pre>			
#			
<pre># [Exploratory Data Analysis] # - Objective: Compute the experimental variogram</pre>			
# to fit it later in variogram fitting.			
# - Input: Main variable # - Output: Experimental variogram			
# - User Parameters: Number of directions, laq distance,			
# number of lags			
# - Hint: Press "Pop-up Next" from the journal file to			
# open the Exploratory Data Analysis panel and then press			
# "Recover Pages" and "Recover All Pages" to see the			
# experimental variogram. Once your own parameters are			
# set from Application/Calculation parameter,			
# press Application/Save to save your Experimental			
# parameter file.			
Bulletin Name =B= Exploratory Data Analysis			
Directory name =A= \$VariableDirectory_Name File name =A= \$VariableFile Name			
File name     =A= \$VariableFile_Name       Data Variable #1     =A= \$Variable_Name			
Reference Variable =A= \$Variable_Name			
	M		
	ł		
Status			
Please select a line, or add a New Action.			
Save As Check	Close		

The editor displays the different tasks and processes made in Isatis. If you like, you can change here variable names or parameter values.

Note that the Petrel Isatis link will work with any Journal File created by the workflow editor or by hand.



### 2. Petrel Workflow

- A. Create a new workflow
  - → Petrel → Right Click in workflow tab → Insert workflow

	Insert folder in tree
▷ ■	Collapse all folders (recursive)
1	Expand all folders (recursive)
5	Insert workflow
5	Add standard summary plotting workflows

A new window appears in Petrel: Workflow Editor

#### → Petrel Workflow Editor → Processes → Export Grid and Wells to Isatis

🔂 Workflow editor for 'Workflow 1"	
Name: Workflow 1 Description:	A
Author: binet 15/10/2013 -	-
Available functions:       Export Grid and Wells to Isatis       Export Grid and Wells to Isatis         Utilities       Operations       Processes       This window allows the export of a Pillar Grid + Wells to the Isatis database.	
Utilities Make/edit surface Make/edit surface Make/edit surface Make/edit surface Map-based volume calculation Export Summary plot to Excel Global grid coarsening Update observed data from OF Ocean plug-ins Export Grid and Wells to Isatis Import Isatis Surface Export Surface to Isatis Import Isatis Surface Export Surface to Isatis CRS consolidation workstep	markerCollection:
	۱. Electric de la construcción de la const
Warning level: 💽 🔃 🔇 Options: 🕖 🔲 🖂	Auto generate workflow
Bun Test Status:	Apply V OK K Cancel

- B. Choose your data to export to Isatis
  - → Double click on the line "Export Grid and Wells to Isatis"

It opens the plug-in window. By default, the connection starts with the last study used by Isatis (if any).



Export Grid and Wells to Isatis [Workflow]	×
Petrel	
Pillar Grid:     GEO Grid	
✓ All Zones at Once Zones: S →	]
Export Surfaces	
Compute Volume Pop. Pop. Pop. Pop. Pop. Pop. Pop. Pop.	
Pillar Grid Properties:	
A Wells:	
Export All Continuous Logs Export All Discrete Logs	
True vertical thickness 1 True stratigraphic thickness Porosity	ps'
Vell Tops Statis	
Advanced Run Default Server	Connect
Existing Study: test_liens_Petrel_Isatis	-
(New) Directory Name: export petrel	-
(New) Grid File Name: GEO Grid	-
Grid Definition Mesh(1,1,1), Origin(0,0,0), Angle(0), RevertI=1	Ν.
(New) Lines File Name: Wells	•
Create Lines File  Append to Existing Lines File	
	K Cancel

The grids are always exported in the stratigraphic space. If a grid and wells are exported at once, the wells will be in the stratigraphic space, but if wells are exported without a grid, they will be in the structural space. If wells are selected, well markers can be exported as point file (In the same space as the well).

Zone can be exported also as zone code.

If a grid is selected, surfaces can be exported in the stratigraphic space. The cell volume between contacts can be exported (to compute GRV for example).



- C. Running an Isatis workflow in Petrel
  - → Petrel Workflow Editor → Utilities → housekeeping folder → System Command

S Workflow editor for "kriging"	
Name: kriging Description:	*
Author: binet 10/10/2013 -	-
Available functions: 2 System command : Send a command line to the operating system Command Prompt (use with care!)	
<ul> <li>Seismic operations</li> <li>Make map operations for 3D simula</li> <li>Make map operations for 3D simula</li> <li>May-based volume calculation</li> <li>Model extraction</li> <li>Model extractions</li> <li>Model extractions</li> <li>Calculators &amp; filters</li> <li>Viells attribute operations</li> <li>Seved searches operations</li> <li>Seved searches operations</li> <li>Seved searches operations</li> <li>General functions</li> <li>Arithmetic operations</li> <li>General functions</li> <li>Arithmetic operations</li> <li>Seved searches operations</li> <li>Seved searc</li></ul>	s isatisStudyName: test_liens_Petrel_lisatis
< <u> </u>	•
Warning level: 🔞 🚺 🔕 Options: 🕢 💢 🛛	Auto generate workflow
Bun @ Test Status:	Apply VOK Cancel

Write this command to use an Isatis Journal File that was saved previously:

D:\Etudes\Test\_liens\_Petrel\_Isatis\JOURNAL\Kriging\_Univariate.ijnl

D. Export Isatis to Petrel

→ Petrel Workflow Editor → Processes → Import Isatis Grid Variable into a Pillar Grid

B Workflow editor for 'kriging"	And a second sec	
Name: kriging Description:		*
Author: binet 10/10/2013	•	-
Available functions:	System command : Send a command line to the operating system Command Prompt (use with care!)	
Utilities Operations Processes		
Seismic operations	1 Export Grid and Wells to Isatis pillarGrid: 🔿 🎒 GEO Grid markerCollection: 🔿 💱 Well Tops	isatisStudyName: test_liens_Petrel_Isatis
Make map operations for 5D simula	2 Sustem command (()his)using(A)iantia ava" avanida D\/Eudas\Teat Jiana, Patral Jantia\IOUENIAI\Krisina, Usiyarista iin	
Model extraction	System contractor provide statistics of version of the statistic of t	isatisGridName: GEO Grid
Property operations		
Make map from property		
Make map from property		
Calculators & filters		
Well operations		
🕀 💼 Wells attribute operations 📃		
Well operations     Wells attribute operations     Points with well attribute operations     Saved searches operations		
Saved searches operations		
Sector modeling     Arithmetic operations		
Arithmetic operations     General functions		
Angle functions		
< +	4 m	•
Waming level: 🕕 🔝 🔕 Options: 🕖 [		Auto generate workflow
Run Test Status:		✓ Apply ✓ OK ズ Cancel

When importing back an Isatis grid variable into a pillar grid, it is compulsory to select the pillar grid that has been exported to Isatis.



#### → Double click on the line "Import Isatis Grid Variable into a Pillar Grid"

It opens the plug-in window. By default the command connect with the last study used by Isatis.

Import Isatis Grid Varia	ble into a Pillar Grid [Workflow]			
Isatis				
Advanced Run De	fault Server Connect			
Existing Study:	test_liens_Petrel_Isatis			
Directory Name:	export petrel 👻			
Grid File Name:	GEO Grid 🗸			
N Variable Name:	Estimation for MD (Kriging) 🗸			
Import the Whole Macro	Variable			
Macro Variable Index:	•			
Petrel				
🞒 Pillar Grid: 🔁	GEO Grid			
💮 Use Existing 📄				
Create New	Estimation for MD (Kriging)			
😢 Help 🖌 Apply 🖌 OK 🖌 Cancel				

For more information, let us help you assessing the quality of your data and implementing this workflow.

Contact our consultants at <a href="mailto:consult-oil@geovariances.com">consultants</a> at <a href="mailto:consult-oil@geovariances.com">consultants</a> at <a href="mailto:consult-oil@geovariances.com">consult-oil@geovariances.com</a>.