

# An introduction to perform the RBF/KT/Dual KT interpolation

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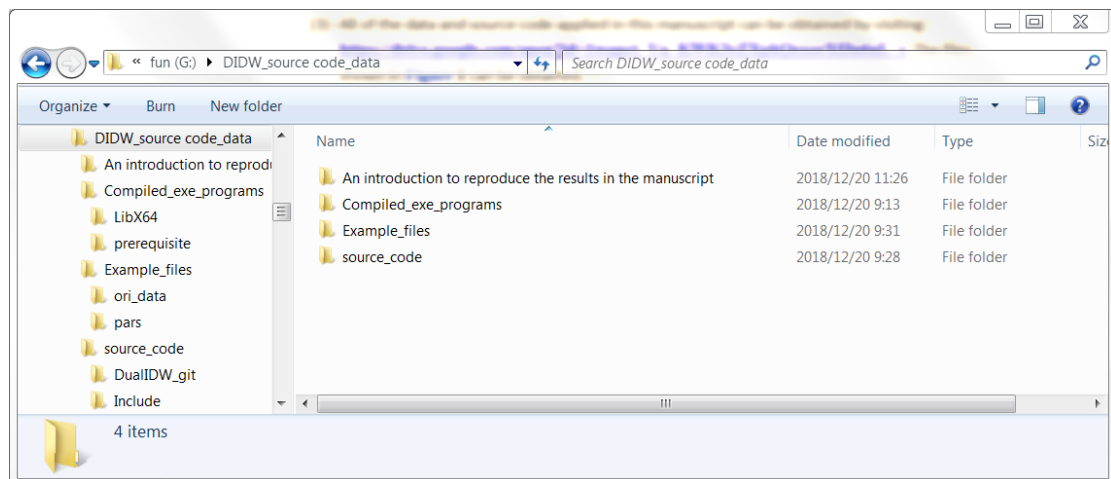
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## Outline

An introduction to perform the RBF/KT/Dual KT interpolation .....	1
1. Prerequisite.....	3
2. Operation steps.....	4

## 1. Prerequisite

- (1) An x64 Microsoft Windows OS is required for the current program.
- (2) An X64 python which can be found in [<https://www.python.org/downloads/>] or [[DIDW\Compiled\\_exe\\_programs\prerequisite\python-2.7.14.amd64.msi](#)] is also needed.
- (3) All of the data and source code applied in this manuscript can be found in the attached file (please see **Figure 1**).



**Figure 1**

2. Operation steps

There are four operation steps to perform the DIDW-based estimation or simulation.

- (1) Open the file “DIDW\Compiled\_exe\_programs\LibX64\Sgems\_X64.exe” (Figure 2). Normally, the plug-in of DIDW will be loaded automatically and shown in estimation category of the algorithm panel (Figure 3 and Figure 4).

名称	修改日期	类型	大小
Sgems_X64.exe	2018/2/2 11:32	应用程序	71 KB
GsTLAppli_gui.dll	2018/2/2 11:32	应用程序扩展	3,143 KB
GsTLAppli_geostat.dll	2018/2/2 11:32	应用程序扩展	1,461 KB
GsTLAppli_extragui.dll	2018/1/30 15:10	应用程序扩展	155 KB
GsTLAppli_filters.dll	2018/1/30 15:08	应用程序扩展	532 KB

Figure 2

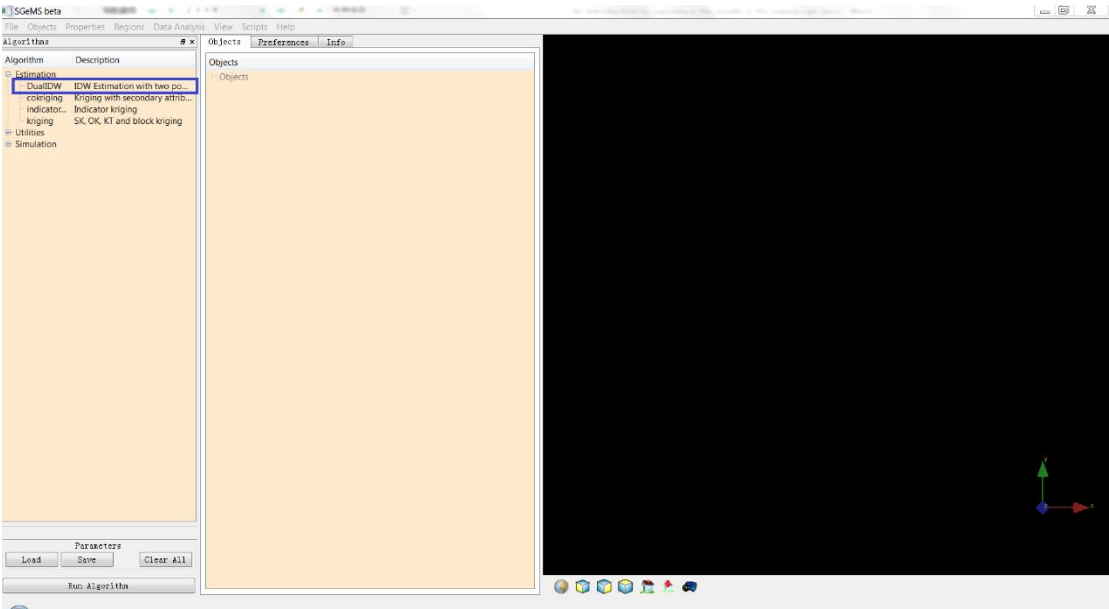


Figure 3

Algorithm	Description
Estimation	
DualIDW	IDW Estimation with two powers
cokrig...	Kriging with secondary attribute
indica...	Indicator kriging
kriging	SK, OK, KT and block kriging
Utilities	
Simulation	

Figure 4

- (2) Use the menu “File | Open project” to open the test project files “DIDW\Example\_files\ori\_data\WalkerLake\_DIDW.prj” (Figure 5 and Figure 6).

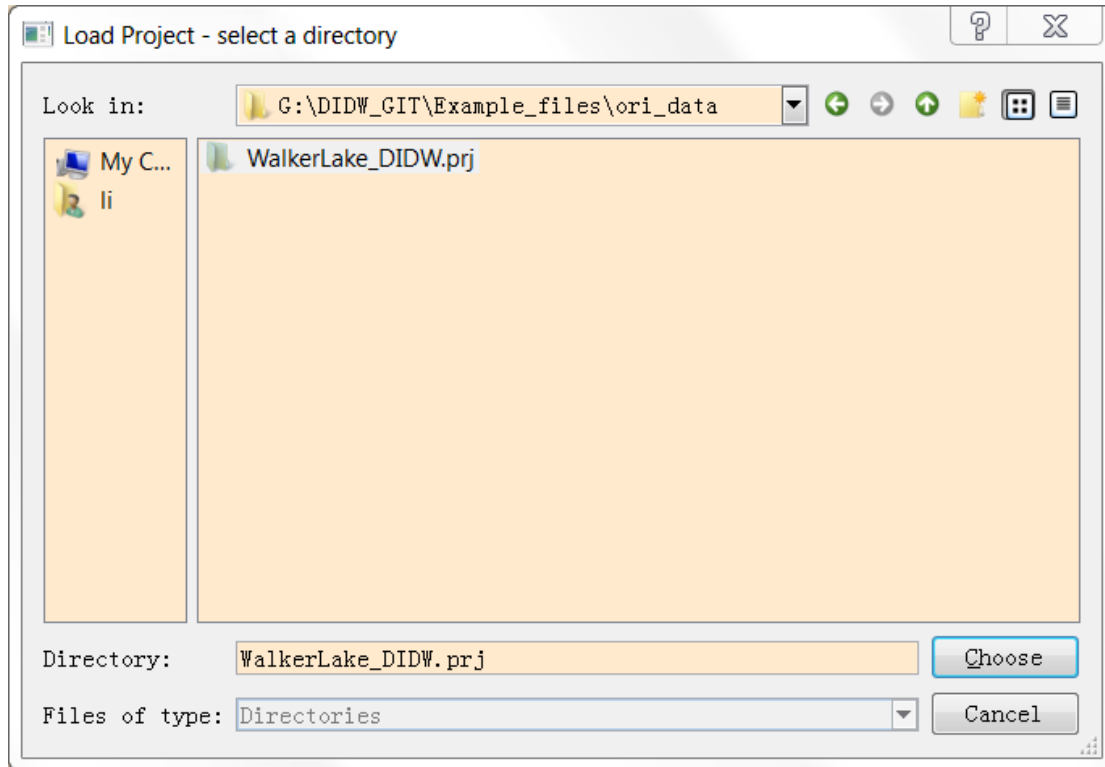


Figure 5



Figure 6

- (3) Click the “load” button (Figure 6) to open one of the general interpolation parameters. The DIDW-estimation algorithm will be located automatically, and the common parameters in an estimation process, such as the variogram model or RBF kernel, search neighborhood, estimation grid and property, hard data, and property will also be set automatically. See Figure 7, Figure 8, Figure 9, and Figure 10.

- Please note that, in Figure 7, the three files: ‘GeneralPars\_KT\_gaussian.PAR’, ‘GeneralPars\_RBF\_gaussian.par’, and ‘GeneralPars\_dual\_kriging\_gaussian.par’, corresponding to the Kriging with a trend (KT), RBF, and dual KT interpolation. After

performing the three methods through the following steps (4) – (5), you will get the corresponding estimates; as you will see, these three methods result in the same estimates.

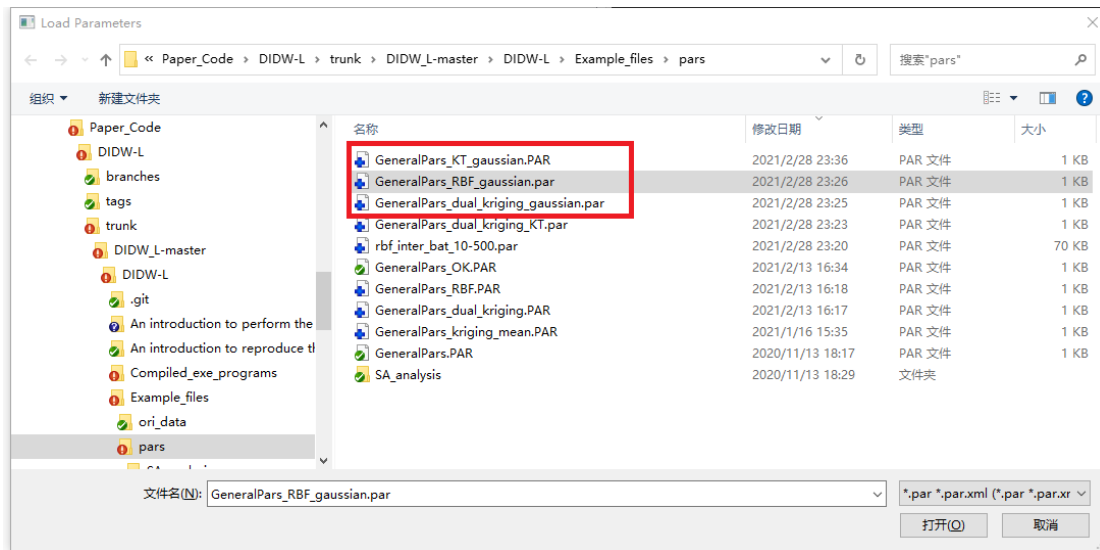


Figure 7

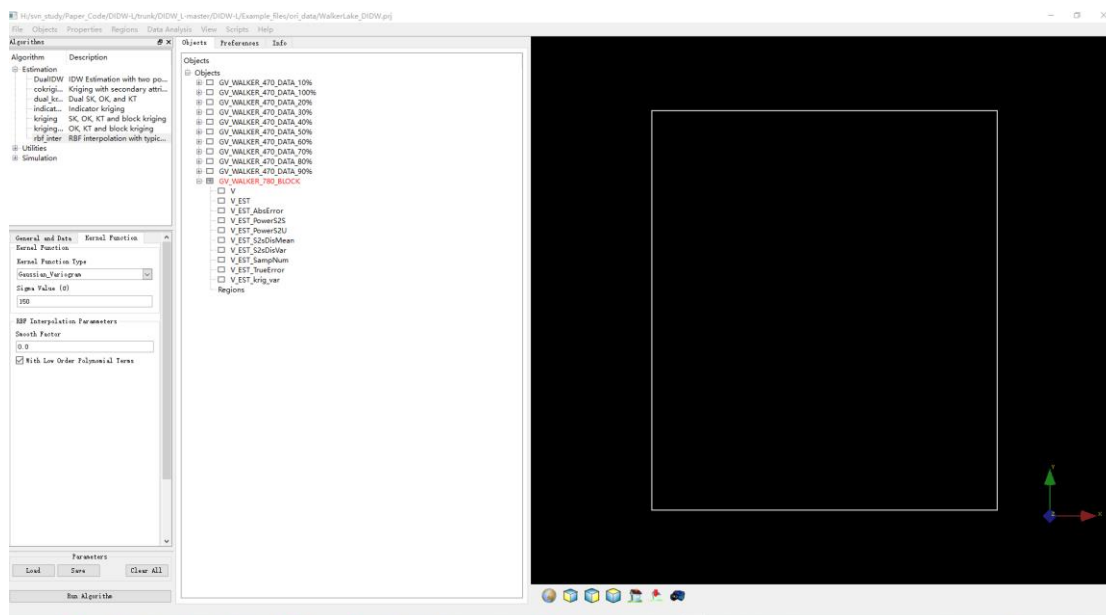


Figure 8

Algorithms

Algorithm

Description

Estimation

DualIDW

IDW Estimation with two po...

cokrigi...

Kriging with secondary attri...

dual\_kr...

Dual SK, OK, and KT

indicat...

Indicator kriging

kriging

SK, OK, KT and block kriging

kriging...

OK, KT and block kriging

rbf\_inter

RBF interpolation with typic...

Utilities

Simulation

General and Data

Kernel Function

Simulation Grid

Grid

Region

GV\_WALKER\_780\_BLOCK

New Property Name

V\_RBF\_Gaussian

Hard Data

Object

Grid

Region

GV\_WALKER\_470\_DATA\_100%

Property

V

Search Ellipsoid

☒ Use Global Search

Conditioning data

Min

1

Max

Ranges

Max

Med

25.001

25.001

25.001

Angles

Azimuth

Dip

0

0

0

Parameters

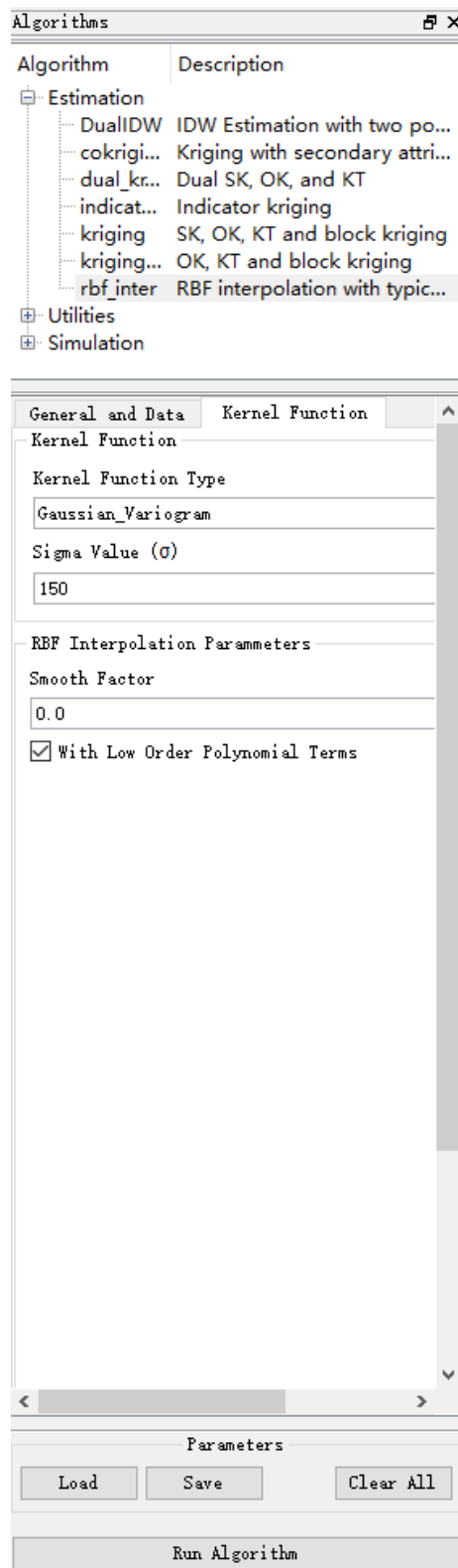
Load

Save

Clear All

Run Algorithm

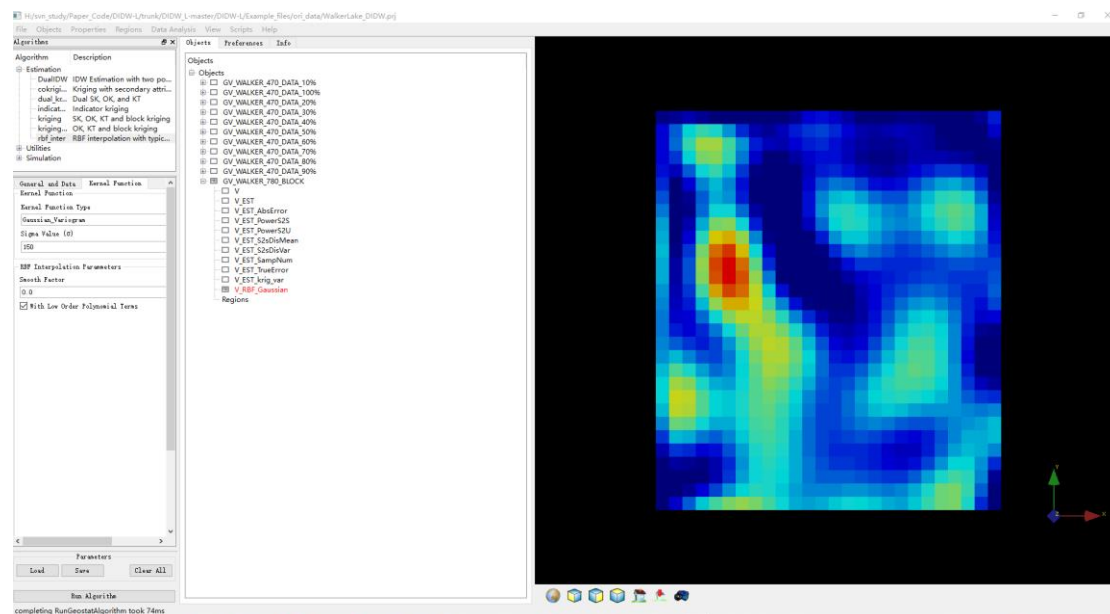
Figure 9



**Figure 10**

- (4) Click the “Run algorithm” button in **Figure 10** to perform the algorithm. The value of “The new property” is suggested to be changed to identify the method being applied. Following the above steps, an estimation map such as that shown in **Figure 11** will be produced.
- (5) Please note that all of the data files in the project can be exported for further analysis using the menu (Object| Export Object).





**Figure 11** An example of estimates from the RBF interpolation