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

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Outline

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**).

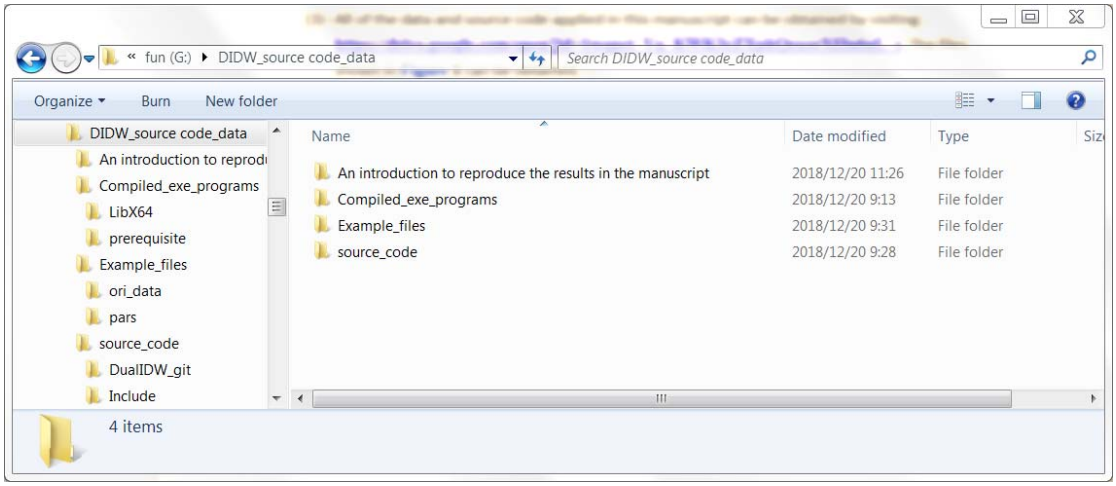

Figure 1

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**).

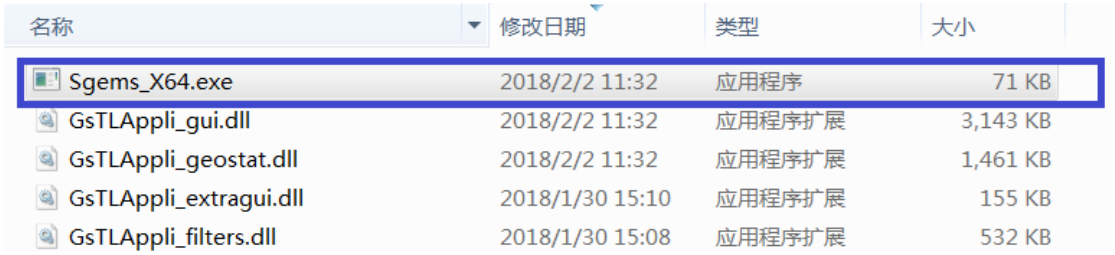

Figure 2

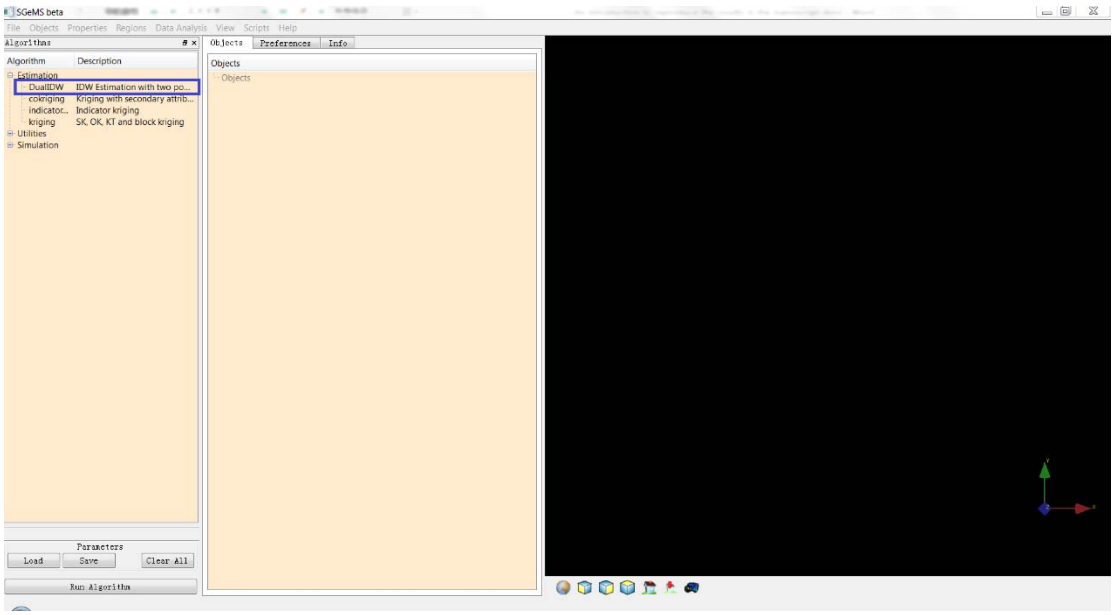

Figure 3

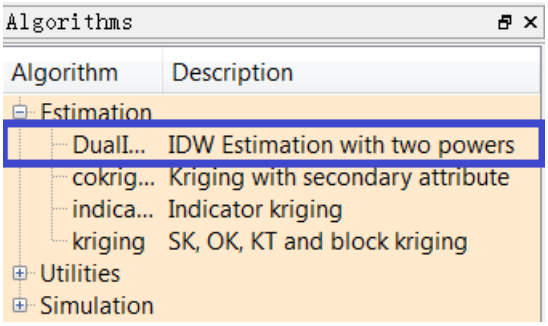

Figure 4

(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**).

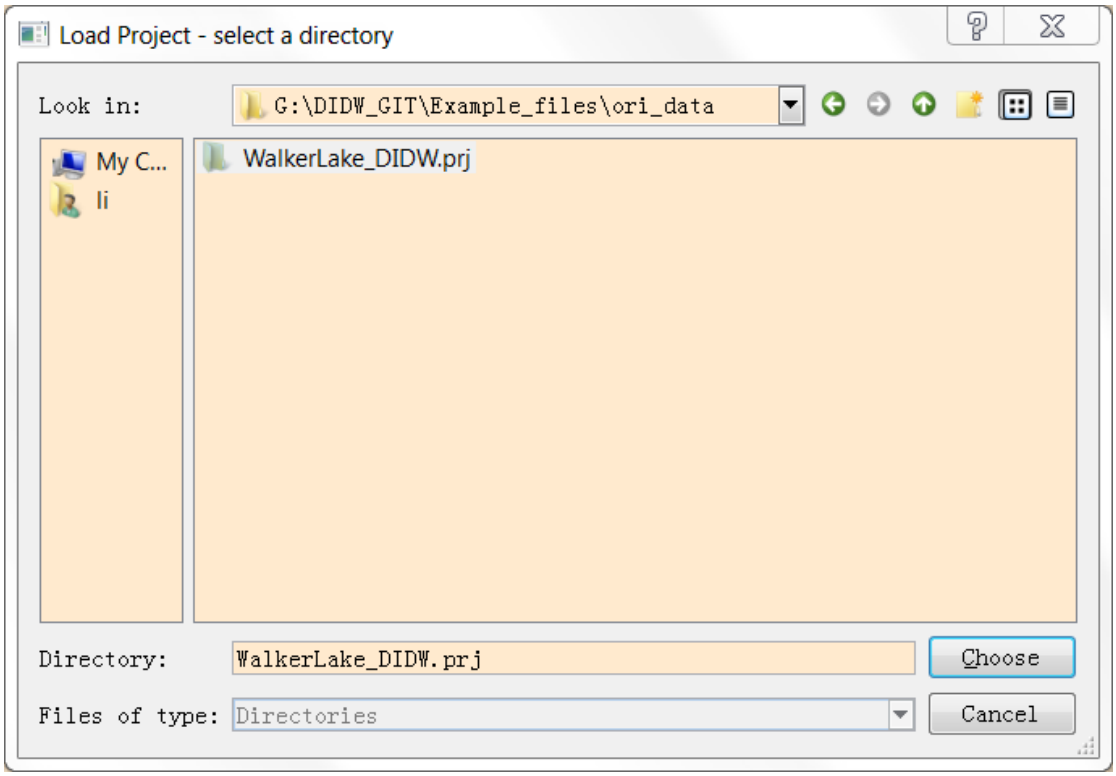

Figure 5

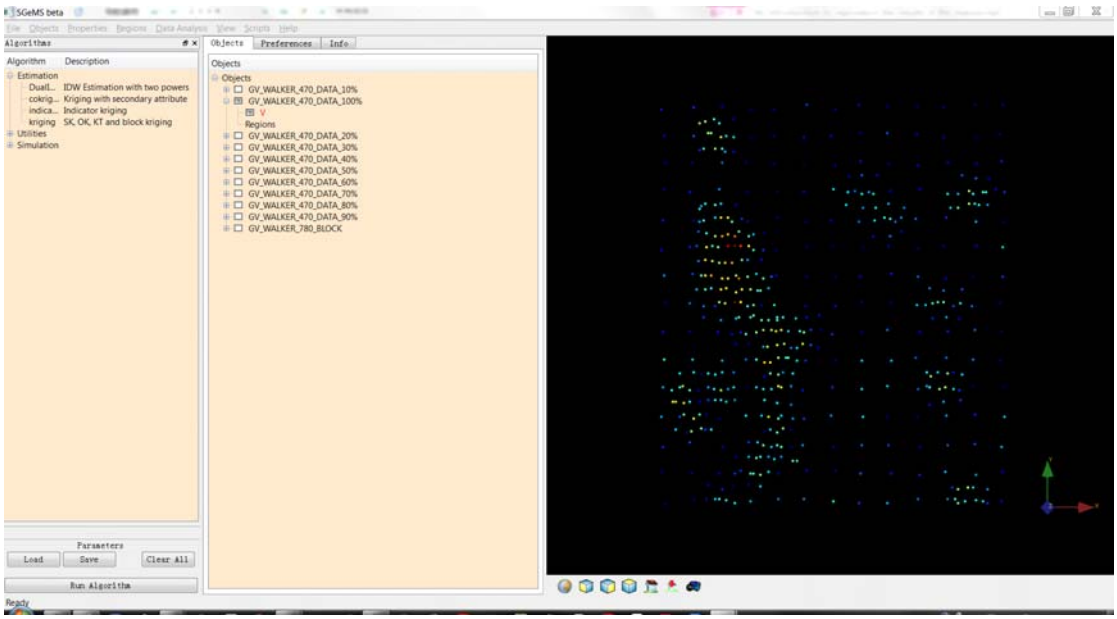

Figure 6

(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, 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 parameter 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, you will find they result in exactly same estimates.

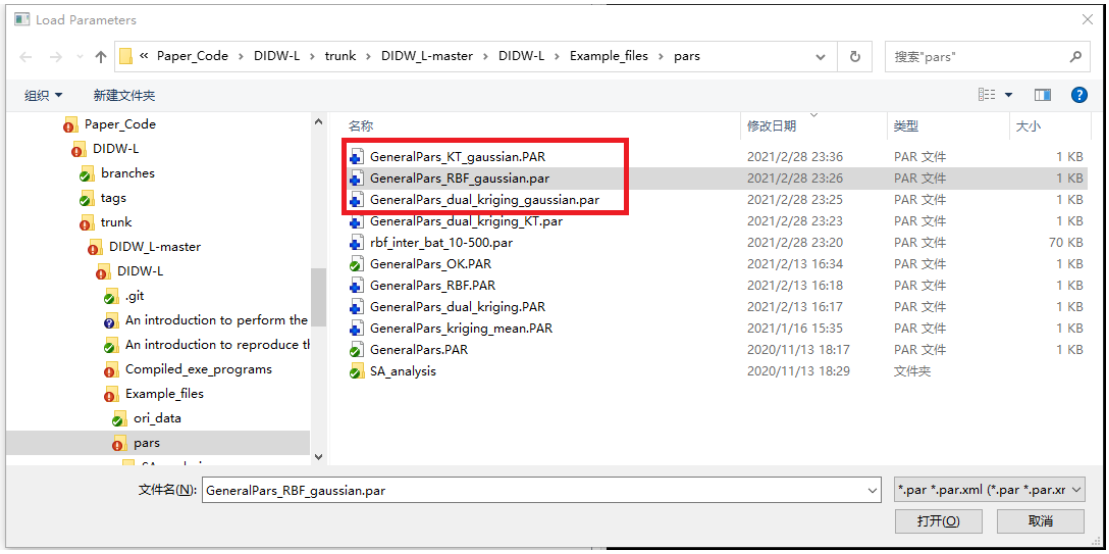

Figure 7

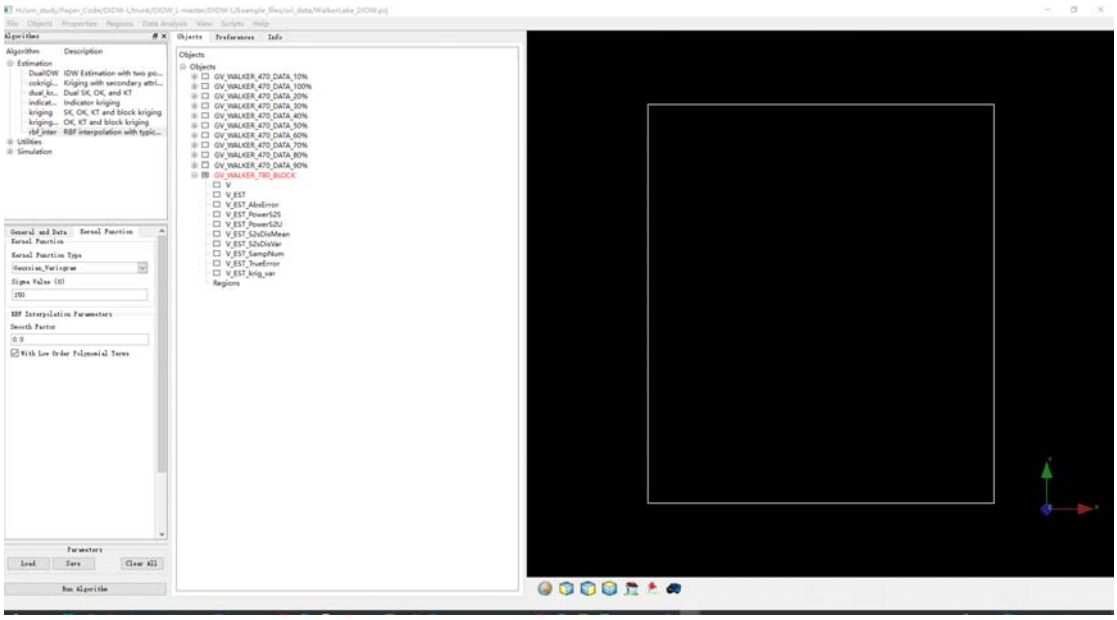

Figure 8

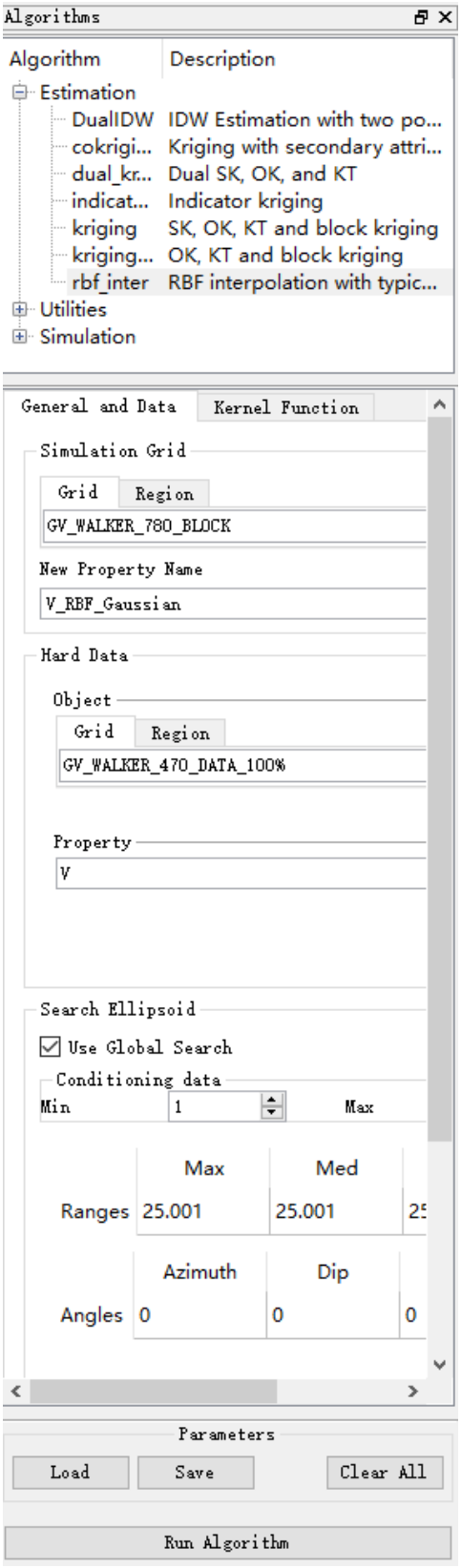
Algorithms
Algorithm
Description
Estimation
DualIDW
IDW Estimation with two po...
cokrigi...
Kriging with secondary attri...
dual_kr...
Dual SK, OK, and KT
indicat...
Indicator kriging
kriging
SK, OK, KT and block kriging
kriging...
OK, KT and block kriging
rbf_inter
RBF interpolation with typic...
Utilities
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
Max
Med
Ranges
25.001
25.001
Azimuth
Dip
Angles
0
0
0
Parameters
Load
Save
Clear All
Run Algorithm

Figure 9

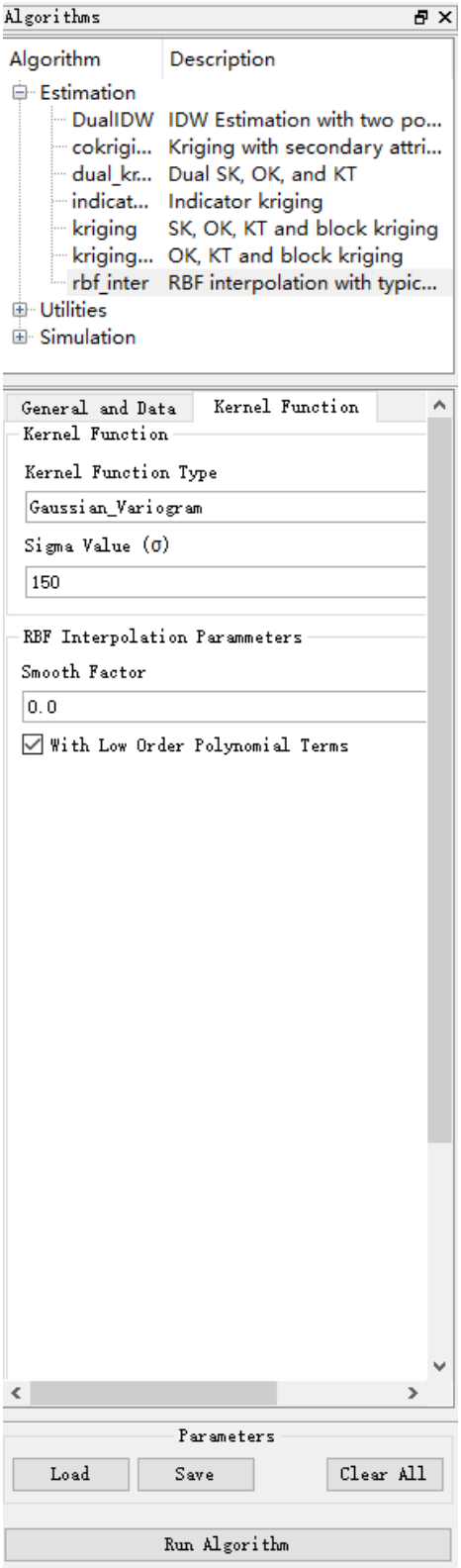

Figure 10

(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).

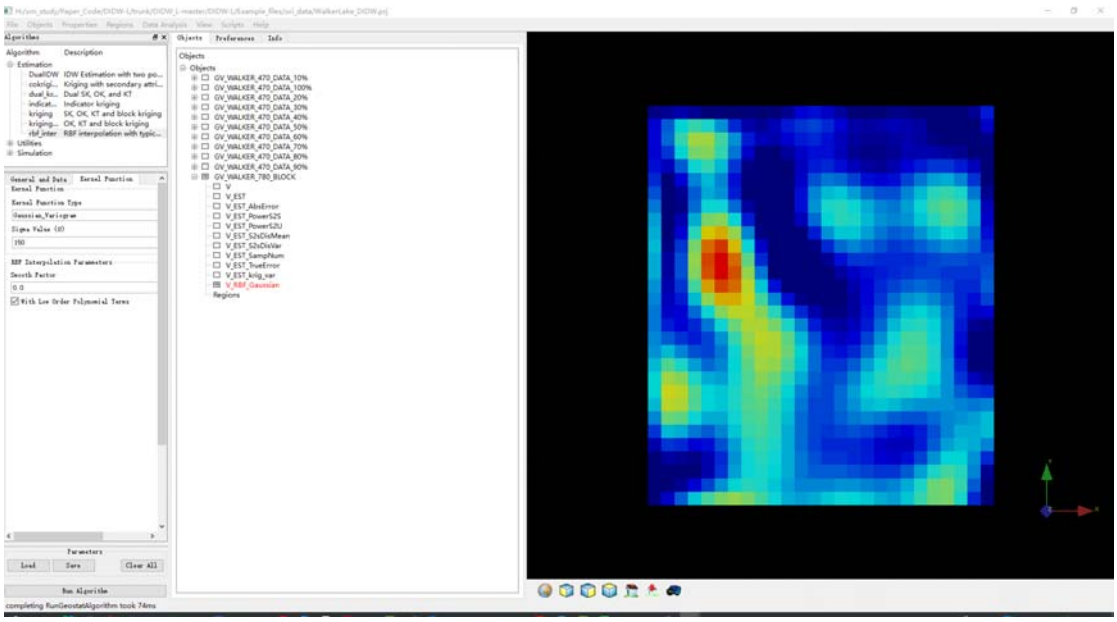

Figure 11