

# An introduction to Reproduce the results in the manuscript

Zhanglin Li  
[lizhl@cug.edu.cn](mailto:lizhl@cug.edu.cn)

## Outline

|  |   |
|--|---|
| An introduction to Reproduce the results in the manuscript ..... | 1 |
| 1. Prerequisite.....   | 2 |
| 2. Operation steps.....  | 2 |
| 3. Notes.....  | 8 |

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 [KrigLavByGA\Compiled\_exe\_programs\prerequisite\python-2.7.14.amd64.msi] is also needed.
- (3) The data and source code applied in this manuscript can be obtained by visiting: [https://github.com/lizhanglin/GK\\_V1](https://github.com/lizhanglin/GK_V1). Please see **Figure 1**.

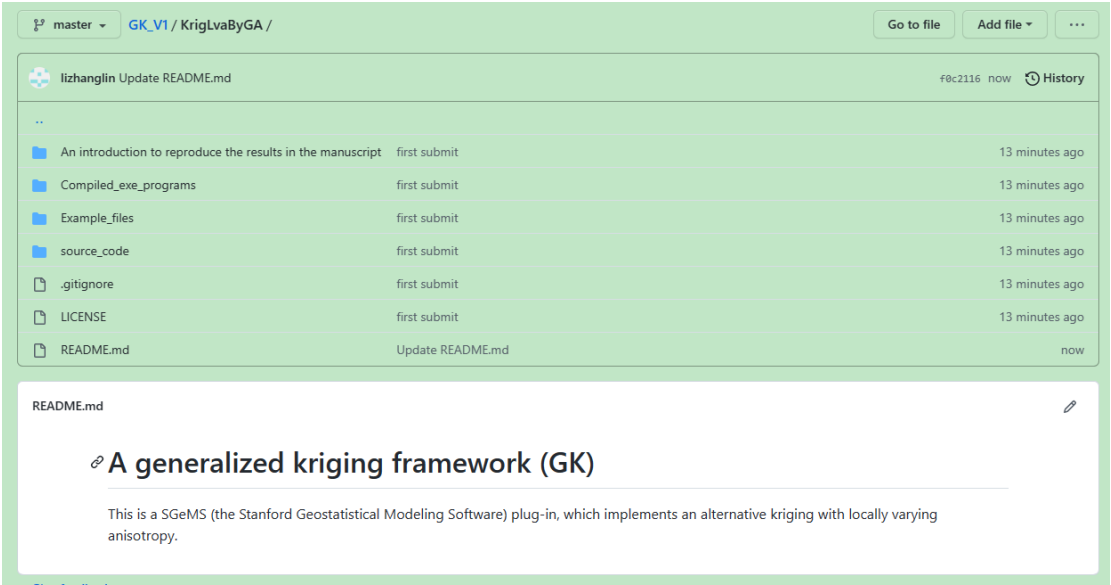


Figure 1

2. Operation steps

- There are four operation steps to perform the GK-based estimation.
- (1) Open the file “GK-Data\Compiled\_exe\_programs\LibX64\Sgems\_X64.exe” (**Figure 2**). Usually, the plug-in of GK will be loaded automatically and shown in the 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

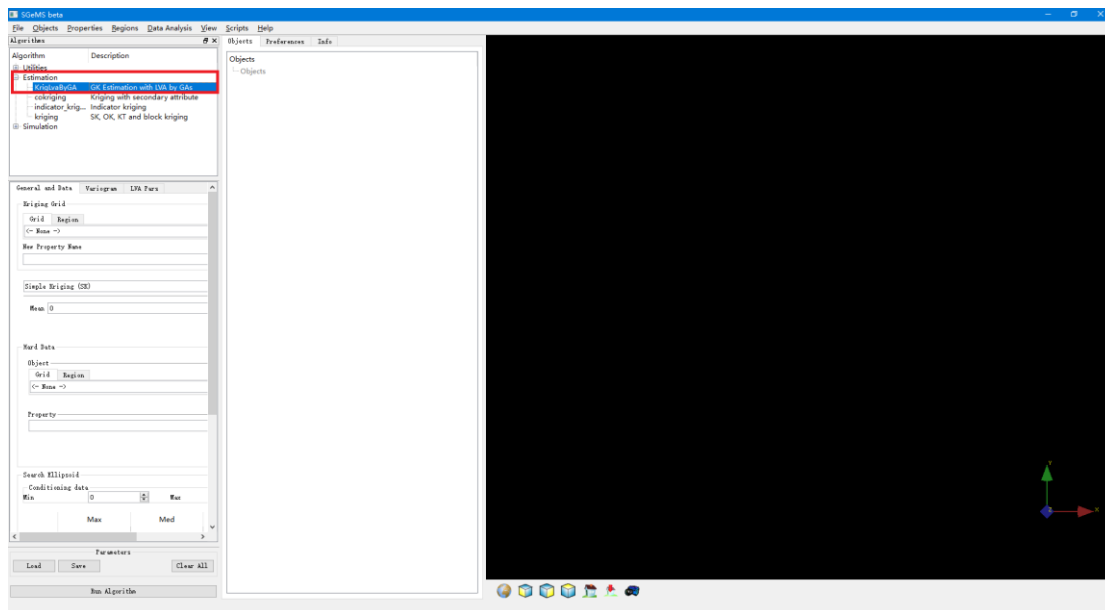


Figure 3

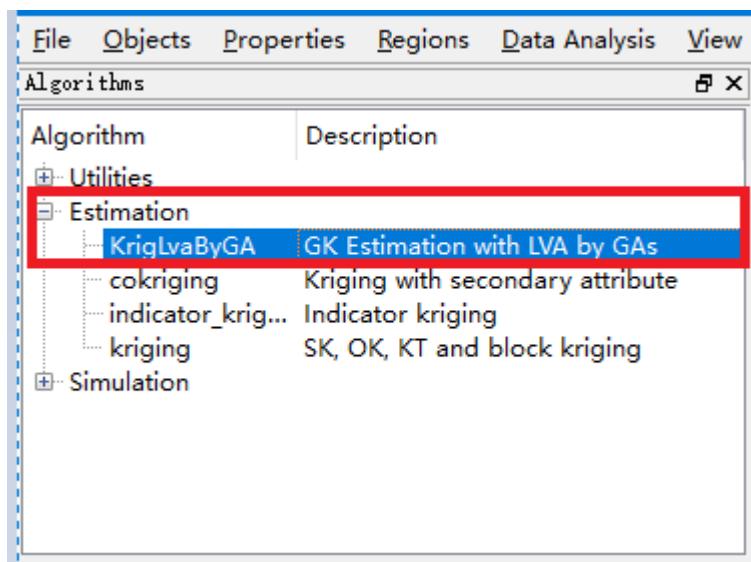


Figure 4

- (2) Use the menu “File | Open project” to open the test project files “GK-Data\data and pars\1. original data\case study 2\s\_dataset\_2.prj” (Figure 5 and Figure 6).

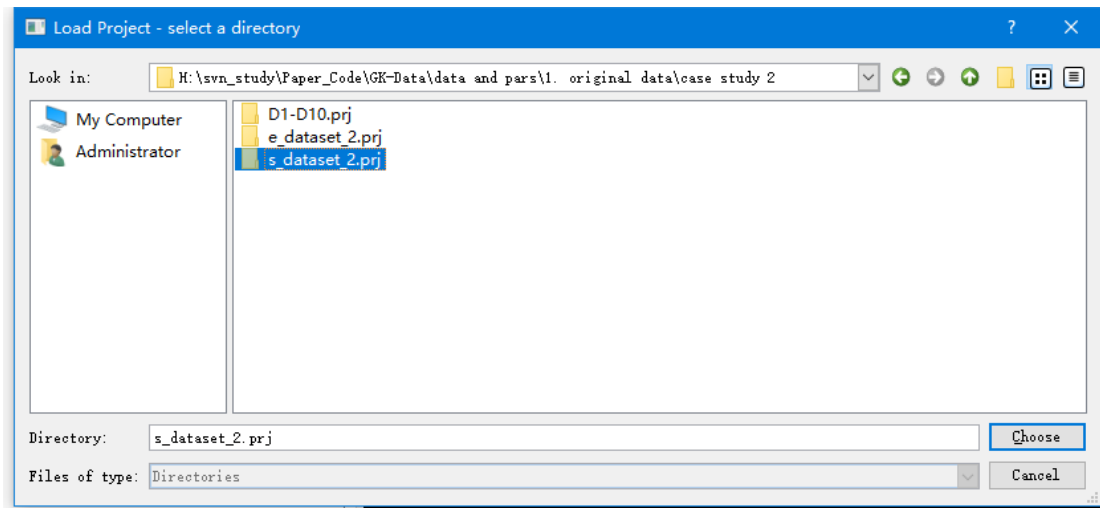


Figure 5

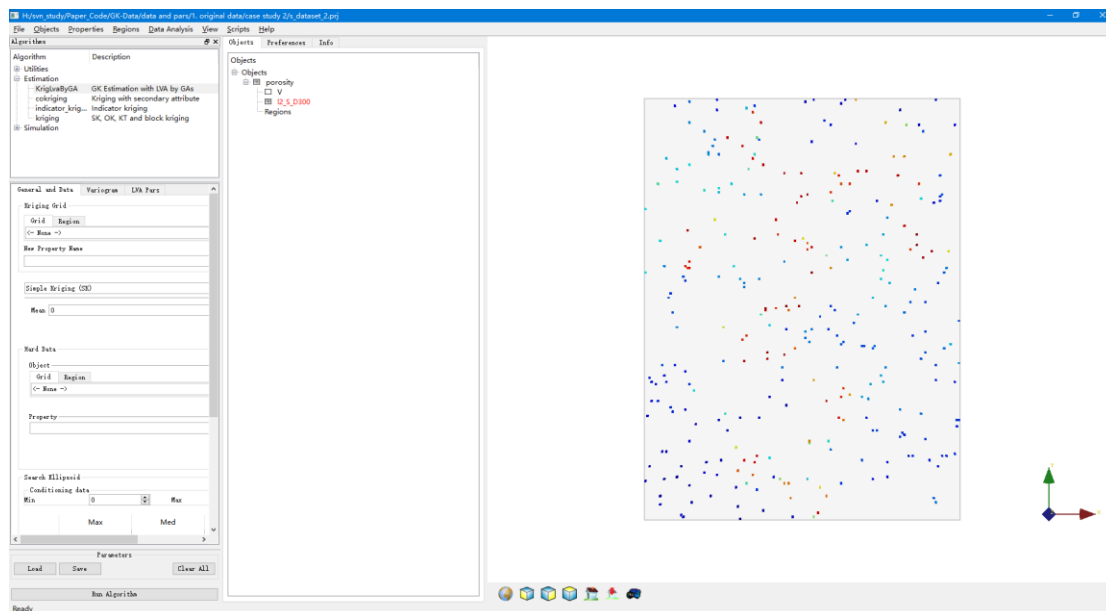


Figure 6

- (3) Click the “load” button (**Figure 6**) to open one of the test parameters. The GK-estimation algorithm will be located, and the standard 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**.

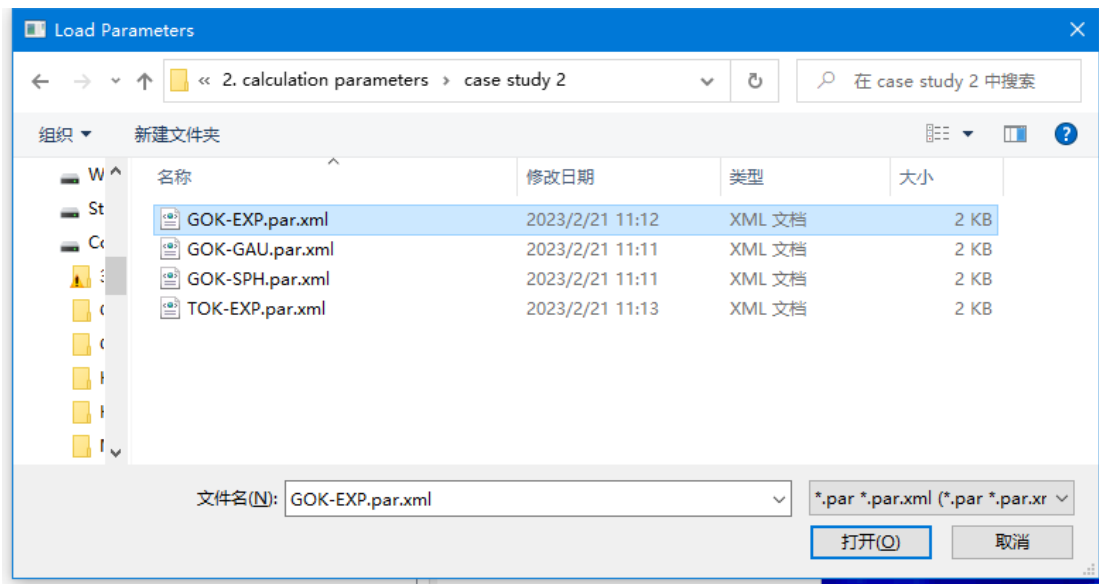


Figure 7

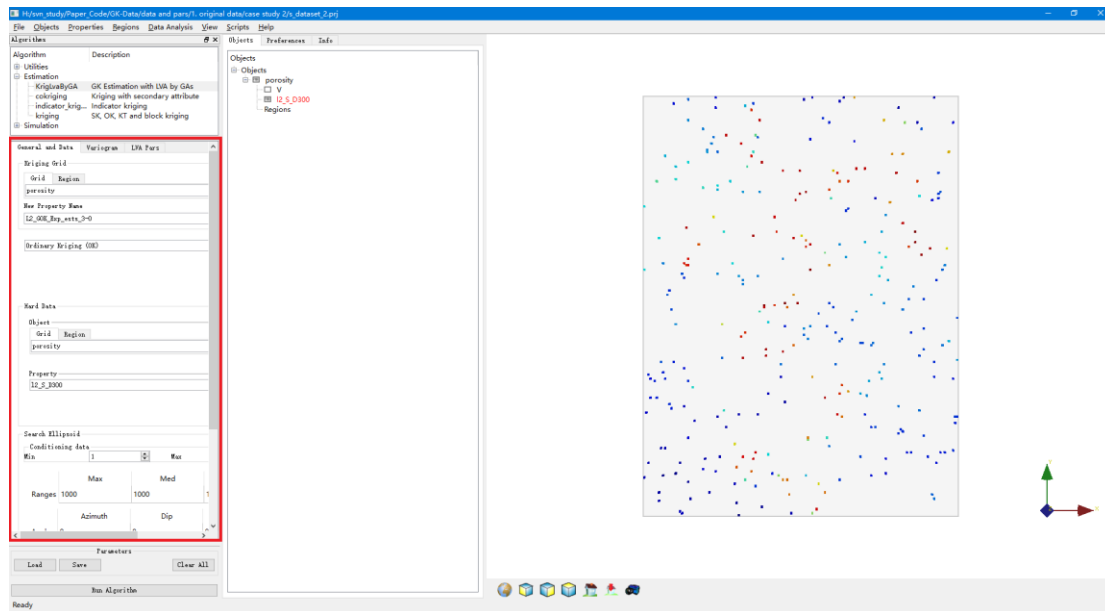


Figure 8

| General and Data  | Variogram | LVA Pars  |
|---|-----------|-----------|
| MSPD/OSPD Distance File   |           |           |
| ford-vi-e porosity\l2_s_1000_random_data\300_data\osp               |           |           |
| LVA Field File Name   |           |           |
| Standard_test_data_circle/LVA_field.out                             |           |           |
| Experimental Variogram File Name                                    |           |           |
| /expvariograms/l2_10  |           |           |
| Will experimental variogram be used? (0- NO; 1- YES)                |           |           |
| 0   |           |           |
| LVA Field Size (e.g., 50 50 1)                                      |           |           |
| 260 300 1   |           |           |
| Performed with LVA? (0- NO; 1- YES)                                 |           |           |
| 1   |           |           |
| Type of Search ellipsoid (0- LVA; 1- DSE-DCF; 2- DSE;               |           |           |
| 0   |           |           |
| Valid value range of estimates (e.g., [-9999999999.9 9999999999.9]) |           |           |
| -9999999999.9 9999999999.9  |           |           |
| Will OK weights be used as initial values? (0- NO; 1- YES)          |           |           |
| 0   |           |           |
| Weight Value Range (e.g., -31 0.0 1.0)                              |           |           |
| -31 0.0 1.0   |           |           |
| Servo-System Correction_W   |           |           |
| -0.9 -0.9   |           |           |
| Is Full random path used for SIM? (0- NO; 1- YES)                   |           |           |
| 0   |           |           |
| Estimation Method (-p -IDW; 1-Kriging-lva; 2-GK-lva; 3-OK)          |           |           |
| 2   |           |           |
| Opt Method (1-GALIB; 2-Simulated Annealing)                         |           |           |
| 1   |           |           |
| GA Type (0-SteadyStateGA 1-IncrementalGA 2-DCrowdingGA)             |           |           |
| 0   |           |           |
| Parameters  |           |           |
| Load  | Save      | Clear All |
| Run Algorithm   |           |           |

**Figure 9**

General and Data
Variogram
LVA Pars

Kriging Grid

Grid
Region

porosity

New Property Name

L2\_GOK\_Exp\_ests\_3-0

Ordinary Kriging (OK)

Hard Data

Object

Grid
Region

porosity

Property

l2\_S\_D300

Search Ellipsoid

Conditioning data

Min

1

Max

|        |         |      |   |
|--------|---------|------|---|
|        | Max     | Med  |   |
| Ranges | 1000    | 1000 | 1 |
|        | Azimuth | Dip  |   |

Parameters

Load

Save

Clear All

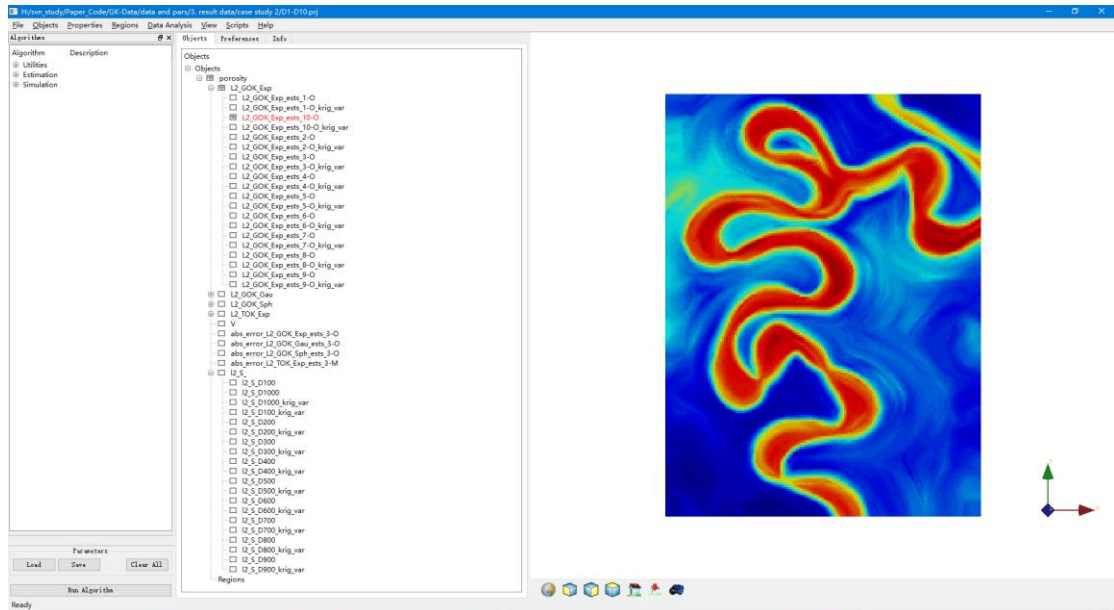
Run Algorithm

**Figure 10**

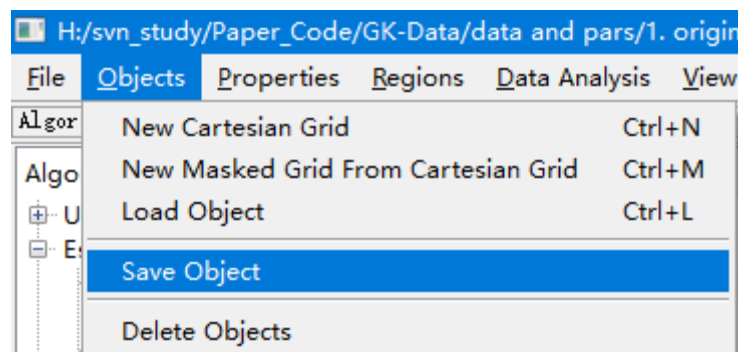
- (4) Click the “Run algorithm” button in **Figure 10** to perform the algorithm. When the estimation is finished, the estimates shown in **Figure 11** will be produced.







**Figure 13**



**Figure 14**