Scholars Bulletin
(A Multidisciplinary Journal)
An Official Publication of "Scholars Middle East Publishers",
Dubai, United Arab Emirates
Website: http://scholarsbulletin.com/

ISSN 2412-9771 (Print)
ISSN 2412-897X (Online)

The Data Transformation between Surfer and Double Arc Software: T3 Reflection Layer Structure Diagram of the Sag in Baxian as an Example

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Abstract: With the rapid development of computer geological software, the efficiency and accuracy of the mapping are greatly improved, and the workload is reduced. We often need to combine several kinds of software to solve practical problems. In this paper, T3 reflection layer structure diagram of the sag in Baxian is drawn as an example to introduce some functions of surfer and double arc software and its application in the concrete work. Then, the necessity of data transformation between double arc and surfer software is proposed and describes the basic method of map transformation, its steps and precautions and so on.
Keywords: Suffer software; Double Fox software; data conversion; Baxian sag.

INTRODUCTION OF SURFER AND DOUBLE ARC SOFTWARE

Surfer software is compiled by Golden Software in the United States to draw a three-dimensional map (contour, Image map, 3d surface). This software is easy to understand and surfer is one of the necessary software for geological workers, because it provides a variety of interpolation methods and powerful drawing ability. The software can produce a variety of maps which contain contour diagram, data bitmap, topography map, vector diagram, plane chart, wireframes and so on [1]. Surfer is widely used in mining, engineering, geology, meteorology, medicine, biology and other fields.

Double arc software is developed by Baoding Hengtaipu double arc Software Co., Ltd., and the company mainly engaged in the exploration and development of petroleum exploration software development, sales and technical services. Double arc software has a number of international leading technologies. Software has been widely used in the oil industry in a variety of graphics production, and its functionality and convenience has been far more than similar software at home and abroad. Double arc software has been rated as the international leading level in the "spatial surface data processing", "massive data reading and computing", "a variety of database integration applications and graphics visualization" and so on [2]. The main features and functions are introduced as follows:

(1) Calculate the intersection point between the data of various kinds of curves, such as the intersection point between the line and the river, the border of the village and the boundary of the pond
(2) Compatible with more data and graphics formats, and direct exchange of data with the workstation interpretation system and drawing system
(3) Better use of CNOOC local map specification to meet the CNOOC map format requirements; improve production efficiency, save production time.
(4) All kinds of basic data using the system are open to read text data format. It is convenient for the user to develop two times.
(5) All maps using Double Fox graphics platform and edit, and output are convenient [3].

Therefore, because bothsoftware have respectively different advantages and disadvantages, two software applications are simultaneously very extensive in the field of geology, petroleum, engineering, mining and other fields. This is a problem that different software data are introduced into each other [4].

APPLICATION OF SURFER SOFTWARE AND DOUBLE FOX SOFTWARE

（1） Well draw pictures in surfer

First, the data in the doublefox software is exported and saved as CSV format. And then modify the TXT format to be able to identify the surfer software. The specific method is to export the data in the CSV format and keep the "x, y, z" three column data. One of the two data is the well point coordinate, and the other is the well point analysis value [5]. Save as Prn format meanwhile manually change the extension to the

TXT format. Import the generated TXT data into the surfer software and put the map and three-dimensional map together.（Map→Overlay Maps）

（2） Once again modified to generate maps

After superposition of the well point map and three-dimensional map, modify the size, color, size of well point mark and display, size, and color of the well name to realize aesthetic effect. Having that done, it's time to drag to the Base layer on the top of the left side of the object manager.

APPLICATION INSTANCE

The following will be the specific project (T3 reflection layer structure diagram of the sag in Baxian) as an example: Explain the specific method of adding the wells in DoubleFox to Surfer.

（1） The generation of wells

First of all, right click and find statistics in double fox in "Wells" layer→choose element statistics→save list (wells.csv).Then open the "wells.csv", keep the three column (Wells, X, Y) and delete the remaining. Then change the column name of wells name to "Z"→Save as "wells.prn"→Convert Manually extension "prn" to "txt". Then click on ""  →"wells.txt"→open. It's time to drag to the Base layer on the top of the left side of the object manager. (Figure 1)

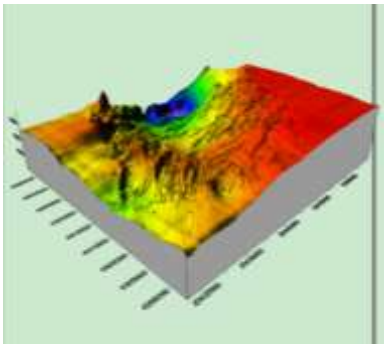

Fig. 1: The generation of wells

（2） Wells symbol style, size, color settings

Color options are black; Symbol size：0.070in. See Figure 2

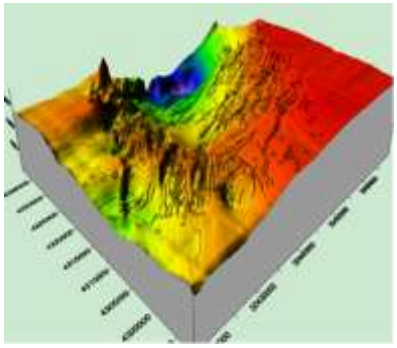

Fig. 2: Modified wells

（3） Show well name

Do the following operation in Labels: Worksheet column→choice Column C:Z. Then set the font of well name: Font Prope→song, Size：7, Bold. See Figure 3

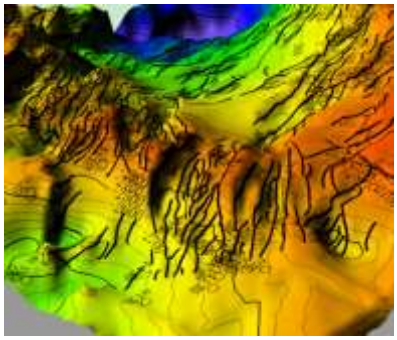

Fig. 3: Show well name

(4) Border Generation

First, click on the edge in DoubleFox→Edit→Right click again→Coordinate list→Save as File→"boundary.csv".Then open "boundary.csv"→Only keep X and Y two column→Save as "boundary.prn"→changed extension to "bln".Last, click  →Select "boundary.prn" and open→adjust line width(0.04) and colour. (Figure 4)

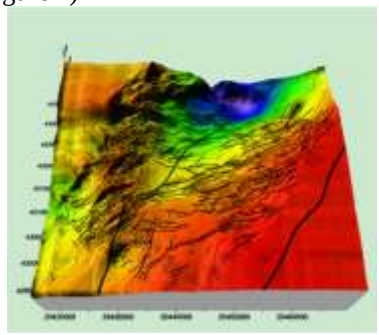

Fig. 4: Border Generation

（5） Add name and scale

According to the map content, product scale and increase the legend. (Figure 5)

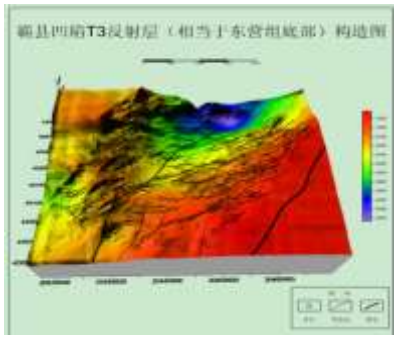

Fig. 5: Add name and scale

CONCLUSION

This paper explains the application of mutual data and maps between DoubleFox software and Surfer software and combined with the actual project as an example and provides reference for workers who frequently use DoubleFox software and Surfer, meanwhile it can extend the software application ideas.

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