

SPIRIT

Knowledge-based interpretation of oil well tests



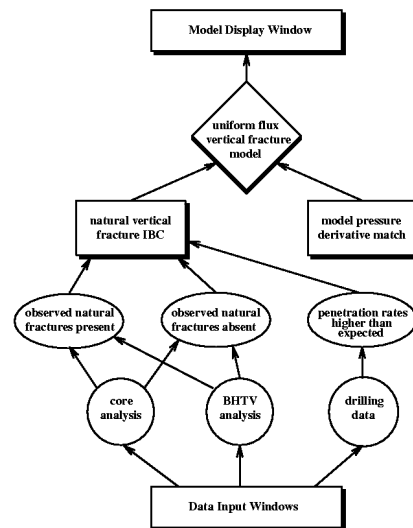
Description:

- ◆ Oil well tests require selecting an appropriate model to describe this particular oil well.
- ◆ This is difficult because:
 - ◆ It requires data from engineers, geologists, geophysicists & petrophysicists;
 - ◆ There is considerable uncertainty in data;
 - ◆ Different models sometimes produce the same response.
- ◆ SPIRIT recommends the most appropriate model to use.



Technical approach:

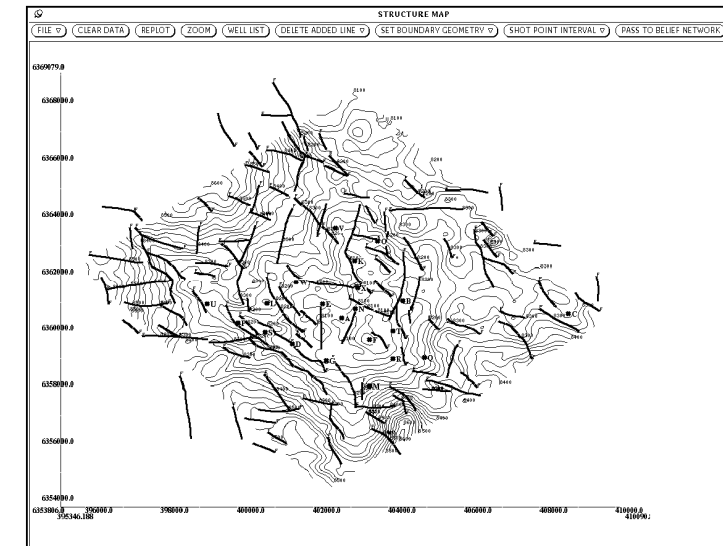
- ◆ A pattern matcher matches (pre-processed) test data with theoretical models to compute model parameters.
- ◆ A belief network uses the non-numerical terms of a world expert to describe uncertainty, and reasons with uncertain data.
- ◆ Several external data interfaces were provided to aid interdisciplinary dialogue.
- ◆ First developed using KEE and Hardy; final prototype used CLOS and XView.
- ◆ *Success through reasoning with uncertainty & supporting multiple experts*



Belief network

Benefits:

- ◆ Semi-automation of pattern recognition in pressure data.
- ◆ Reduced the non-uniqueness problem.
- ◆ Knowledge-based decision support.
- ◆ Integrates geological and engineering information with pressure data.
- ◆ Potential uses as a training tool and to carry out well test design calculations.



Data interface: geological structure



AIAI, Petroleum Science & Technology Institute (now ITF),
Enterprise Oil, Shell UK, Amoco, Bow Valley, Elf-Enterprise.
<http://www.aiai.ed.ac.uk/project/spirit/>

Acknowledgement for image of drilling rig: www.middlebury.edu/SouthChinaSea/

