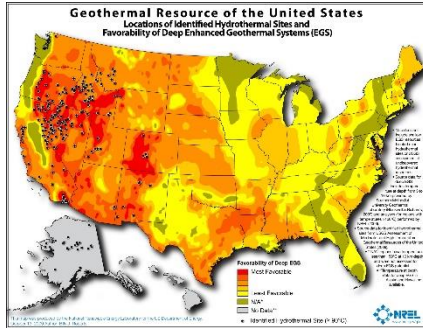


Accurate Exploration of Geothermal Energy

Multi-Physical Data-Driven Exploration Technique to Characterize the Reservoirs for Locating the Geothermal Energy

BACKGROUND & MOTIVATION

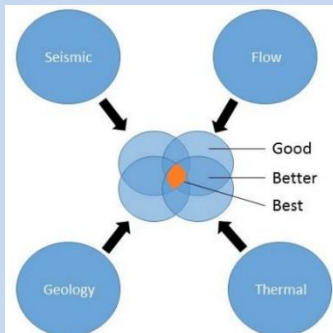


- According to US EIA, **9** western states together have the geothermal potential to provide over **20%** of electricity needs.
- DOE aims a **ten-fold** increase of US electricity production from geothermal reservoirs within the next **10 years**

INNOVATION

Multi-Physics Exploration method

- Conventional geophysical methods are expensive and yields low accuracy
- Our methods utilize measurements from different physical domains to better characterize the geothermal reservoirs

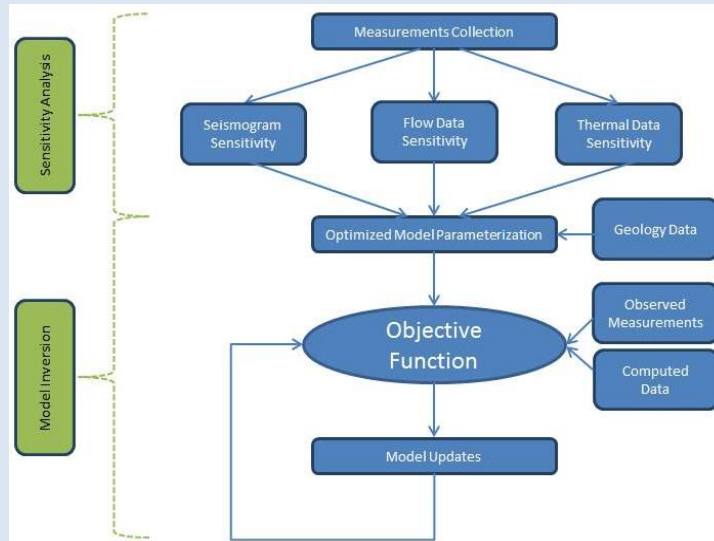


DESCRIPTION

A Novel Data-Driven Multi-Physics Characterization of the geothermal reservoirs

How it works:

- Our proposed method consists of two major components: the **sensitivity analysis** and the **model inversion**, as illustrated by the flowchart
- The **sensitivity analysis** provides an optimized geomodel parameterization scheme
- The **model inversion** yields an numerical solution of the multi-physics inversion



TRL 3: The proposed technique is being tested based on some field data sets acquired at Raft River Geothermal site at Idaho, and Soda Lake Geothermal site at Nevada.

ANTICIPATED IMPACT

Accurate Characterization of Geothermal Reservoirs:



- Optimize the geophysical survey to accurately delineate the geothermal reservoirs' parameters (shape, size, depth), providing effective drilling schemes
- Reduce geothermal exploration costs by improving computational accuracy and eliminating data redundancy

PATH FORWARD

Validate algorithms against broader types of data and various geothermal sites

- Include more physical measurements, such as flow, thermal and geology data
- Apply to other geothermal sites including both conventional geothermal systems and enhanced geothermal systems.
- government or commercial use

Potential End Users:

- Both government and private sectors
- University research

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