

MODERN SEISMIC PREDICTION WORKFLOWS AND ITS AUTOMATIZATION TOOLS

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Today the standard seismic interpretation can be defined as two-staged process, where the first stage is aimed on structure definition and the second – on reservoir properties prediction. Seismic interpretations workflows are very flexible and can significantly vary depending on the required solutions and initial data for the fields. Despite this variability there is set of regular time-consuming tasks of seismic reservoir characterization (SRC) such as seismic well-tie and seismic inversion which are necessary steps for SRC workflows for exploration and FDP studies.

In the given work we would like to present two automatization SRC tools for:

1. seismic well tie process
2. interpretation of seismic inversion results

The first tool AWT (automated well tie) was designed to democratize seismic well-tie process. There are several possible objectives in performing well ties: zero phasing, horizon identification, wavelet extraction for seismic inversion or modelling and offset scaling. (R. Simm et al, 2014). Seismic well-tie is always treated by geophysicists as very specific procedure which requires the experience and deep understanding of the seismic interpretation and processing issues. The AWT tool significantly simplify the process of well-tie for numerous wells and helps geoscientist to apply their experience in more effective way by reducing the time for routine iterative operations of seismic well tie.

The second tool ‘Inversion to Geology’ represents the automated service which allows directly predict reservoir properties from seismic inversion cubes by using ML algorithm. This tool complements and in some cases can replace the detailed rock physics study by optimizing the parameters of Gaussian PDF to maximize the convergence of the integral of probability with reservoir parameters (NTG, Sand thickness etc). ‘Inversion to Geology’ generates instantly a generous number of maps and helps to

geoscientists expertise how reasonable and applicable the calculated maps for instead of spending time for multiple calculations.