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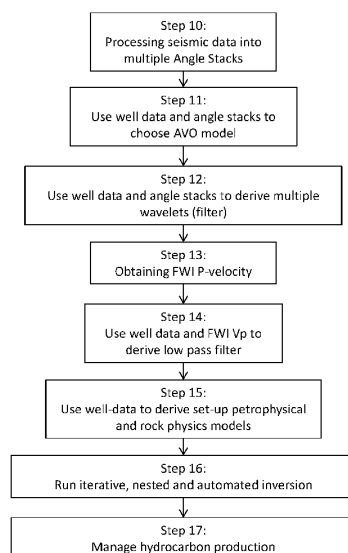
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(54) Title: METHOD FOR ESTIMATING PETROPHYSICAL PROPERTIES FOR SINGLE OR MULTIPLE SCENARIOS FROM SEVERAL SPECTRALLY VARIABLE SEISMIC AND FULL WAVEFIELD INVERSION PRODUCTS

Figure 1



(57) Abstract: A computer-implemented method for determining rock and fluid parameters of a subsurface region from measured seismic reflection data, said method including: generating, with a computer, a geophysical data volume by combining a plurality of angle stacks obtained from the measured seismic reflection data and geophysical property data obtained from a full wavefield inversion of the measured seismic reflection data; for each point of the geophysical data volume, determining, with a computer, a petrophysical model that is a probability of a rock state based on initial values of the rock and fluid parameters and the geophysical data volume; iteratively determining, using a computer, updated values for the rock and fluid parameters, wherein the iteratively determining includes determining a petrophysical parameter estimate for the rock and fluid parameters from the petrophysical model as constrained by the geophysical data volume and the initial values of the rock and fluid parameters, minimizing a misfit between the geophysical data volume and synthetic data generated from a forward modeling of the initial values of the rock and fluid parameters using a cost function that includes the petrophysical parameter estimate of the rock and fluid parameters, and repeating the iteratively determining until a predetermined stopping criteria is satisfied and final values for the rock and fluid parameters are generated, and each subsequent iteration of the iteratively determining replaces the initial values for the rock and fluid parameters with the updated values for the rock and fluid parameters from a previous iteration; determining, with a computer, uncertainty in the final values for the rock and fluid parameters; and exploring for or producing hydrocarbons using the final values for the rock and fluid parameters and there uncertainty.

TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
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