

## General elastic inversion, Orange Basin RSA case study

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General Elastic Inversion is a specific inversion process that is designed to combine both P and S impedance volumes in a straightforward and meaningful way to emphasize rock pore fluid type. Like the Fluid Factor (Smith and Gidlow, 1987) and Rp-Rs (Castagna and Smith, 1994) it combines both volumes by summation of  $V_p$  and  $V_s$ . The calibrated results are simple and values non-arbitrary.

In essence the process has 2 steps, proper execution of both is required to get good results. The first step is generation of the pseudo-shear volume in a way that produces real pseudo-shear values, the second step is the combination and re-projection of the P and S volumes.

In the pre-stack domain the objective is to obtain converted s-wave shear amplitudes at different offset angles. We employ a rigorous new 'full Zoeppritz' solution.

The inverted P and S volumes are combined and re-projected to produce a 'fluid' volume and a 'porosity' volume. Examples are from the 3D surveys over the giant Ibhubesi gas fields offshore the Republic of South Africa in the Orange River Basin.

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