

# Using Vp/Vs Ratio to Predict Fluid Type in Oil Reservoirs: Case Study from an Oil Field, Southwest of Iran

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## Abstract

The compressional wave velocity is a key for lithology and porosity prediction in petrophysical analysis (sonic logs). Shear wave velocity is very useful in determining mechanical rock properties. In oil and gas reservoirs, compressional wave velocity decreases and shear wave velocity increases. The increase of shear wave velocity is due to the decrease of density and the absorption of deformation by oil in pores and the decrease of compressional wave velocity is due to the decrease of bulk modulus of reservoir rocks; therefore the Vp to Vs ratio, Vp/Vs, will decrease and it is more sensitive to change of fluid type than Vp or Vs separately. The use of Vp/Vs is a key parameter in reservoir study and it plays a key role especially for lithology and fluid type prediction methods. A field example in southwest of Iran is given to identify fluids type (water and oil) using the Vp/Vs ratio from well logs. The results have shown that shear wave velocity increases and compressional wave velocity decreases when the water saturated points become oil saturated points in the studied intervals.

**Keywords:** compressional wave, shear wave, fluid type, SW Iran