Heavy Oil Classification & Characterisation

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Heavy oil is characterized as viscous fluid having API ranges less than 22’. Seismic velocities are sensitive to heavy oil properties and especially to the reservoir properties, such as changing temperature, pressure conditions. Laboratory studies have shown that the Heavy Oils with much lower API’s, can act as a semi-solid and could hence support shear wave propagation. In such cases, conventional methods to seismically characterize reservoirs are not applicable. With increasing number of laboratory measurements on heavy oil rock samples, advanced rock physics analysis can be incorporated to accurately understand the pore-matrix conditioning due to PVT changes and characterize reservoirs spatially using quantitative seismic techniques. The talk will demonstrate the effect of such changes on seismic signatures with an example from Middle Eastern Heavy Oil Carbonate Reservoir.