

## **GASSMANN'S FLUID SUBSTITUTION MODELLING OF A CARBONATE RESERVOIR IN JOYA MAIR OIL FIELD, PAKISTAN**

Khaista Rehman<sup>1</sup>, Shah Muhammad Imran<sup>1</sup> and Pervez Khalid<sup>2</sup>

<sup>1</sup> *National Centre of Excellence in Geology, University of Peshawar, Khyber Pakhtunkhwa 25120,  
Pakistan*

<sup>2</sup> *Institute of Geology, University of the Punjab  
rehmannceg@upesh.edu.pk*

### **Abstract**

The theory for the propagation of seismic waves through saturated rocks was developed by Gassmaan. This equation is widely used for the rock physics modeling and it relates bulk modulus of rock to properties of pore, frame and fluid. This kind of seismic analysis provides a tool for fluid recognition and computation in reservoir. This technique effectively used to calculate the bulk modulus of saturated porous media. The main aim of the present study is to delineate seismic properties of reservoirs (e.g. velocity and density) in Joya Mair Oilfield using Gassmaan's equation. In general, the Gassmann fluid substitution is used for sand reservoirs application. In the present study, rock physics modeling was performed on the reservoir rock (Sakesar Limestone) to check the applicability of the Gassmann's fluid substitution technique on carbonate reservoirs.