
Reflection Tomography for Validation of Subtle Structures: A Case History from Southern Tunisia

Harald Granser, OMV, gerasdorfer str 151, Vienna, A-1120, Austria, phone: 40440, harald.granser@omv.com and Oezsen Refik, Paradigm Geophysical, Woking, GU21 6JG, United Kingdom.

Recent exploration success for oil and gas in Triassic Reservoirs in the Ghadames Basin in eastern Algeria suggests a similar potential in the Tunisian part of the Basin. Due to the subtle structures of the Triassic reservoir strata, the exploration success has been hampered by inaccurate seismic trap definition, the main causes being static problems due to sand-dunes at surface with low velocities but also by uncertainties in depth-conversion because of velocity variations in the deeper section. Trap definition errors caused by variable seismic interval velocities within the Mesozoic section related to the presence of evaporitic units may exceed the uncertainties caused by static problems. Existing well control in the area indicates that also velocity variations in the shallow, sometimes outcropping cretaceous carbonate layers may also cause significant variations in the depth conversion. Reflection tomography was applied to validate a subtle TAGI time closure identified within OMV's exploration block. This lead has a closure of 15 ms and modest velocity variations in the overburden may have a significant effect on the size and even validity of the prospect. Location and closure also varies substantially depending on the processing vintage used. This is primarily due differences of the static corrections. Critical prerequisite before embarking on tomography was therefore proper pre-processing with special emphasis on the static solution. The effects of the horizon based tomographic velocity model update on the depth sections (PSDM) are subtle but significant, resulting in a horizontal shift of the prospect.
