



Meso- to Cenozoic seismostratigraphic units of the Austral Basin, southern Argentina

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Although numerous oil and gas fields have been developed on- and offshore in the Austral Basin, southern Argentina, some major aspects concerning the hydrocarbon system remain open. Despite the knowledge of potential source rocks and reservoirs of the basin, the processes of hydrocarbon generation and accumulation in time and space, including migration and leakage dynamics are poorly understood. In order to better understand the HC system within the Austral Basin and how it may have been influenced by the regional tectonic setting, we carry out an integrated basin analysis including onshore-offshore correlations and modeling of hydrocarbon generation, migration and sequestration dynamics through geologic time. The methodological approach includes seismic interpretation and identification of the main seismo-stratigraphic units, analysis of depocentre migration through time and detailed mapping of gas escape/ sequestration features. Geochemical/ petrological analysis of available oil, gas and sediment samples and basin modelling are also planned.

The seismo-stratigraphic analysis is based on a dense grid of 2D industrial seismic-reflection profiles located onshore, well information and published reports.

Our pre-liminary interpretation has allowed to identify seven seismo-stratigraphic units: Seismic Basement (Paleozoic- Jurassic), Upper Jurassic, Lower Cretaceous (potential source rock and reservoir), Upper Cretaceous, Palaeocene, Eocene and Upper Eocene/Oligocene. These units can be correlated with major tectonic events reported in the literature, including four major basin stages during Mesozoic-Cenozoic times: (i) extensional tectonic during Triassic/Jurassic correlated with the deposition of a volcanic formation, (ii) synrift phase with marine/fluvial deposition of Lower Cretaceous sediments, (iii) compressional phase related to the rise of the Andean mountains, resulting in a fore deep basin and finally (iv) subsidence in the western part of the basin with a more or less horizontal layering of Upper Cretaceous and Tertiary sediments. We observe a general decrease of sediment thickness for the Upper Cretaceous and Tertiary units from west to east, while older sediments do not show a significant thickness variation. The deepest part of the basin is located in the southwest, with the basement at >5000 m, while in the eastern part the basement is at approx. 2 km depth.