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Generation of Synthetic Sonic Logs and Their Application in the Development of Mature Fields

The Golfo San Jorge basin is the oldest petroliferous productive basin in Argentina. The development of this basin begun early in the past century, for this reason a lot of mature oil fields don't have electric logs or have only a few of these. Actually, because of the advanced stage of development, this basin needs methodologies more suitable to identification of reservoirs, and to know the continuity and petrophysic proprieties of beds for secondary development. For these studies the 3D seismic data and sonic logs are very important. The absence of sonic logs in several oil fields, and therefore the matching of well data with seismic data, originated the necessity to develop a methodology for generating synthetic sonic logs. Our proposal is the partition in low and high frequencies of the sonic log and the reconstitution of these separately, using resistivity and nuclear logs. The behaviour of low frequencies are strongly influenced by the tectonic environment and regional geological history, then the analysis of these allow us to understand the geological history of the sedimentary column. The coefficient of correlation of synthetic sonic logs and the registered sonic logs is between 0.87 and 0.95. The synthetic sonic logs were used to match well data with seismic, trace inversion, geostatistical analysis and petrophysical evaluation. The result of these studies gave place to more than twenty wells that honour the predictions of these analysis, where we used synthetic sonic logs verifying the good approximation acquired with these logs.