

## **The Rescue of Old 2D Seismic Data to Lower the Risk and the Cost of Exploration: An Example of the Soledad Area, Eastern Venezuela**

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**Pilar Stifano**<sup>1</sup>, Carlos Azalgara<sup>2</sup>, Carlos Scala<sup>3</sup>, Jose Antonio Morello<sup>4</sup>, Yormar Caballero<sup>5</sup>, and Pablo Alarcon<sup>5</sup>.  
(1) Petrobras Energía Venezuela, Av. Venezuela, Torre Lameletto, Piso 7, Urbanización El Rosal, Caracas, 1060, Venezuela, phone: 58-212-9577380, fax: 58-212-9577303, pstifano@petrobrasenergia.com, (2) Petrobras Energía Venezuela, Caracas, 1060, Venezuela, (3) Oficina Técnica Geosoft, Caracas, Venezuela, (4) Cartografica Mercator, Caracas, Venezuela, (5) Veritas Geoservice, Caracas, Venezuela

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This study documents a methodology to use 2D seismic data (950 km) acquired in the 70's, to evaluate exploratory prospects, whose reserves have been estimated in the order of tens MMbls of oil. These prospects are located in Soledad area (Eastern Venezuela) which extends for 1230 km<sup>2</sup>. The seismic data, which was acquired through three different surveys, present poor seismic image and severe navigation errors, due to an improper conversion from the original coordinates system to the UTM system, and to the lack of the original surveying information.

The navigation data correction was obtained through digital stereo-photogrametric techniques performed on two sets of aerial photographs. These sets, that were recorded after the seismic acquisition, show the seismic trails. The displacement vector to correct the intersections of the available seismic grids, shows a range of -136 to 86 meters eastward and 223 to 409 meters northward.

To improve the structural image the seismic processing was focused on statics correction combined with better tools of velocities picking and mute. An important improvement of the signal/noise ratio and vertical resolution was obtained through spectral balance with very fine parameters. To get an effective diffractions collapse a 100% DMO velocities migration was applied. It was possible to perform pre-stack Kirchhoff migration, which confirmed the images obtained with the post-stack migration finite differences.

The results allowed us to better delineate the structures, which are the most important elements of the petroleum system in the area, and to save the cost of new 2D seismic acquisition estimated in tens million dollars.

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