

## **Examination of the Libyan Mediterranean Margin Using Regional 2-D Seismic Data**

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The reopening of Libya in 2004 to international exploration companies created great interest in Libya's Mediterranean margin. With over 500,000 km<sup>2</sup> offshore area to explore, Libya was a tempting target. Then four dry holes drilled by Woodside in 2006-2007 combined with unfavorable leasing terms from the Libyan government curbed foreign enthusiasm. Now two recent offshore discoveries by Hess and Repsol have rekindled international interest.

The Mediterranean margin of Libya can be divided into three physiographic provinces, the Pelagian Shelf, the Sirt Embayment, and Offshore Cyrenaica. The petroleum potential of the Pelagian Shelf has been established. The Sirt Embayment is the site of two recently announced discoveries. Offshore Cyrenaica is almost unexplored. During 2004-2005, new 2D pre-stack time-migrated seismic data were acquired and used to examine the large-scale structural, depositional, and salt tectonic features of the Libyan shelf and slope. The data cover approximately 38,000 line kilometers in water depths ranging from under 50 to over 3000 meters.

The Libyan margin has a demonstrable progradational character punctuated by surfaces of erosion and margin failure. Within the Sirt Embayment the most visible retrogradational surface becomes seismically coincident with the top of Messinian unconformity. This retrogradational surface extends for over 700 km along strike and cuts both sides of the Sirt Embayment. Over 5000 cubic kilometers of material are missing from above this surface. How margin retrogradation occurred is of key exploration interest. One idea ties retrogradation to margin erosion during the Messinian salinity crisis. A second possibility is that the Libyan margin experienced a cataclysmic failure during the late Miocene.