



The deep Algerian margin structure revisited by the Algerian-French SPIRAL research program, stage 1 : MCS seismic cruise

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The Algerian – French SPIRAL research program uses deeply penetrating low frequency multichannel and wide-angle seismic methods to study the structure of the Algerian margin and adjacent basin. This presentation will show the context and objectives of the SPIRAL program together with some new insights brought out from Multichannel seismic (MCS) data acquired during the 1st leg of SPIRAL cruise. A significant part of the convergence between Africa and Eurasia appears to be accounted for along the Algerian margin leading to unravel an incipient stage of subduction. Actually, a progressive transfer from a plate limit to another occurs along the Algerian margin, which is neither an active subduction nor a classical passive margin. A major issue is to identify and discuss clues for a progressive transfer of deformation from the Miocene plate limit on land to the foot of the margin offshore. Subsequently the Algerian margin is subject to major seismic risks and might exhibit potential natural resources in its offshore basin. In order to understand the complex and multiphased structure and evolution of the margin including the embedding of the Kabyle units in response to the subduction roll back of the Tethyan ocean and the present-day implications on the seismic risks and resources, we use seismic images to constraint the deep structure of the Algerian basin margin, the Kabylia massifs, and the Tell domain. The SPIRAL MCS Cruise was conducted onboard the R/V Atalante in September and October 2009. During the experiment, 2300 km of seismic data were recorded along 21 lines, using a 360-channels, 4.5-km-long streamer together with a 3110 in3 seismic source. This high penetration seismic data set ideally completes an existing set of high resolution seismic data (Maradja experiments) and already reveals some interesting clue of the margin structure deep structure and inversion. Indeed, these lines allow us to penetrate below the Messinian salt unit and down to the Moho both in the basin and below the margin. This data set together with the complementary wide angle data considerably renew our understanding of the Algerian margin and Alpine belt and help to elucidate the complex Cenozoic and Quaternary evolution of this less known size of the Mediterranean.