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First images of the crustal structure across the eastern Algerian margin, from deep penetrating seismic data.

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The Algerian continental margin North Africa presents one of only a few examples of a passive continental margin formed in a back-arc environment, which undergoes current compression and is proposed to be reactivated today. In the framework of the Algerian – French SPIRAL research program (Sismique Profonde et Investigation Regionale du nord de l'ALgérie), a seismic cruise was conducted on the R/V Atalante from September to November 2009. During the cruise, deep penetrating low frequency multichannel and wide-angle seismic data were acquired in order to study the deep structure of the Algerian margin. In this work, we present the preliminary results from wide-angle modeling of the North-east Algerian margin in the region of Annaba along a N-S transect using a data set of 42 OBS (ocean bottom seismometers) along a profile extending 117km, and 13 broadband seismological stations along a profile of 80 km length. Travel-time tomography and forward modeling were undertaken to model the velocity structure in this region. The resulting velocity models image the thickness of the sedimentary layers, which varies between a few hundred meters on the continental margin of more than 4 km in the basin. The crust is about 6 km thick in the basin, and thickens to 7-8 km between 40 and 60km distance from the margin toe. Crustal thickness increases to about 22 km at the continental slope over a distance of $\sim$ 90 km. The nature of the crust was determined to be thin oceanic with abnormal velocity gradient in the basin, and thinned continental from around 30 km distance from the coast landward.

Integration of the wide-angle seismic data with multichannel seismic, gravity and magnetic data will help to better understand the structure of the Algerian margin and the adjacent oceanic basin in the Annaba region, and to discuss the numerous cinematic models proposed in literature regarding the formation of the north-Algerian basin.