



Evolution of rifted continental margins: the case of the Gulf of Lions (Western Mediterranean Basin)

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The formation of rifted continental margins has long been explained by numerous physical models. However, field observations are still lacking to validate or constrain these models. This study presents major new observations on the broad continental margin of the Gulf of Lions, based on a large amount of varied data. Two contrasting regions characterize the thinned continental crust of this margin. One of these regions corresponds to a narrow rift zone (40-50 km wide) that was highly thinned and stretched during rifting. In contrast with this domain, a large part of the margin subsided slowly during rifting and then rapidly after rifting. The thinning of this domain cannot be explained by stretching of the upper crust. We can thus recognize a zonation of the stretching in both time and space. In addition, the Provencal Basin is characterized by a segmentation of the order of 100-150 km. These observations have important consequences on the formation and evolution of the Gulf of Lions margin. Independently of the geodynamic context, we can propose some general features that characterize the formation of rifted continental margins.