

The Baza basin: A post-Tortonian pull-apart basin controlled by lithosphere tearing processes at a STEP boundary of the Gibraltar Arc Suduction System

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A recent study of the architecture and tectono-stratigraphic evolution of the Baza basin shows a continuous continental sedimentary record from the latest Miocene to the Middle Pleistocene (~ 6 Ma to 0.6 Ma). This long sedimentary history existed under a general NW-SW transpression and related NE-SW synsedimentary extension in a large-scale STEP boundary context linked to the Gibraltar Arc subduction system. The STEP boundary produces a westward lithospheric tearing which, acts as the engine of the tectonic processes responsible for the formation of a mosaic of interconnected intermontane basins separated by progressively emerged islands. The well-known Baza fault defines the western and southwestern edge of the Baza basin. This fault induced a differential subsidence of more than 1000 m between the centre of this basin and its borders where the Tortonian sediments outcrop to an elevation of 1100 masl. This normal fault is yet active and it produces the divide with the Guadix Basin. New crustal data by migrating P-receiver functions along a dense seismic profile reflect important differences between the crustal thicknesses under the hanging and footwall of the Baza fault. We propose the Baza fault is a crustal structure controlling the evolution of a pull-apart basin in a large-scale STEP boundary context. This structure could be the cause of a local "crustal boudinage" that should explain the current abnormal uplift rate of the Guadix sub-basin.