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Arabia's northwest plate boundary prior to its localization along the Dead Sea Transform

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The breakup of Arabia from Africa began in the Early Oligocene, but the northwestern boundary of the Arabian Plate along the Dead Sea Transform (DST) only formed 10-15 million years later (Early-Mid Miocene). During the early stage of continental breakup the northwestward propagating Red Sea rift continued straight forward forming the Suez Rift, and the present $\sim 45^{\circ}$ northward twist of the plate boundary from the Red Sea to the Gulf of Eilat still did not exist. What happened at the northern tip of the Suez Rift at that time? How was strain distributed from that point to its surroundings and where did the plate boundary continue from there? Here we describe an abandoned segment of Arabia's northwestern plate boundary that extended from the northern tip of the Suez Rift northeastwards, along the Levant continental margin. Seismic data collected offshore Israel reveal a subsurface, crustal scale, faulting zone running along the base of the continental slope. These faults indicate Oligocene activity and hint for lateral shearing by transpression. We propose that during the early stages of continental breakup a left lateral strike slip motion in the order of 10 km took place along this embryonic plate boundary. Such deep-rooted tectonism implies that unlike the passive situation of the Israel-Sinai continental margin witnessed presently and prior to the Oligocene, during the early stage of the Africa-Arabia breakup this part of the continental margin was reactivated. We further suggest that the inland jump of the plate boundary towards the DST was not immediate and that during the transitional period the Israel-Sinai triangular block was an independent sub-plate with deformation along all of its margins. In a sense, this situation currently characterizes the Galilee-Lebanon block.