

THE GACHIN FAULT ZONE AS THE MAIN CAUSE OF THE RECENT DEFORMATIONS ON THE SEDIMENTARY COVER AND THE 2014 MAY 27 EARTHQUAKE IN THE SOUTH OF QESHM ISLAND

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ABSTRACT

The SE of Zagros belt is dominated by the left-lateral strike-slip faults. The NE-trending Gachin fault zone is one of the main transverse faults that cross cut the major structures of Bandar Abbas zone and continued to the Persian Gulf, in which deformations of the fault are overprinted on the major structures. The Qeshm fault trace shows a left-lateral bending because of the reactivation of Gachin fault zone. Based on the field, remote sensing and sismotectonics studies, the Gachin fault zone is the main cause of the recent deformations on the Quaternary sediments in the Qeshm Island and the surrounding areas. The activities of Gachin fault zone are continuing to present time. Migration of the earthquakes to the SW shows that this fault is the main cause of 2005/11/27 and 2014/5/27 earthquakes in the area

The northeast ward movement of the Arabian Plate towards Central Iran is in favour for the reactivation of Gachin fault zone. Therefore, it is proposed that such convergence can account for the reactivation of similar fault zones in the Zagros Fold-Thrust Belt.

INTRODUCTION

The Qeshm island lies in the eastern Persian Gulf, about 10 km off the Iranian mainland (Fig. 1b). It is about 110 km in length but as little as about 10 km wide, and trends ENE, parallel with the mainland coast. Geologically, the island is part of the Zagros folded belt, which is made of marly sediments. There are three major anticlines in the island, trending EEN-WWS, NW-SE and NE-SW (Fig. 2). There have been few documented studies about seismicity of the island (Alinaghi, 2007 and Nissen et. al., 2007). Active faults in the island have been investigated in this article and the main cause of the recent deformations as earthquakes was introduced. The Qeshm island marks the southern edge of the Zagros fold system where seismicity of Zagros diffuses into the Persian Gulf (Fig. 1b). Based on historical records a few destructive earthquakes have inflicted damages on the island in the past centuries. The location of earthquakes (of the twentieth century) in Iran shows that the island has been the locale of only a few background events, see Fig. 1. Nevertheless, in 2005 November 27 and 2014 May 27 with $M_w = 5.9-5.3$ earthquakes (Fig. 2), the relative seismic quiescence of the island ended and a number of moderate and small earthquakes shook the island.