

EVALUATION OF TECTONIC STRESS IN THE MAKRAN ZONE

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The Makran zone is located over 900 kilometers long in the south-east of the Iran and south of the Pakistan. The region is the only part of the Iranian plateau, in which the oceanic crust of the Arabic plate, with a slight slope to the north that it is subducted below the continental crust of Iran. The subduction region along the Makran coast was first introduced by Stoneley (1974). Some of researchers study about the region by using field data related to coastline and analyzed aerial photos to confirm the existence of a subduction region and construct a tectonic model to determine the subduction features for Makran (Shearman, 1977; Farhoudi & Karig, 1977; Page et al., 1979; Rigo et al., 2018). The Makran subduction rate is estimated to be about 2 cm per year, which increases slightly from the west to the east (Page et al., 1979).

Considering to tectonic activity in this region and the continuation of subduction and the existence of a long-run fault zone in the northern section of the Makran, which is located on the northern margin of the Oman Sea, this region has a high risk of strong earthquakes and the resulting tsunami.

We used the seismic moment data (reported by the Harvard center) for calculation of stress drop and the focal radius by Equations 1 and 2 respectively. Finally, we are calculating Gutenberg-Richter parameter (b values) and differential tectonic stress parameters $\sigma_1 - \sigma_3$ by Equations 3 and 4 respectively (Rigo et al., 2018).

$$\Delta\sigma = 3.65 * 10^3 * M_0^{0.165} \quad (1)$$

$$r = 0.0493 * M_0^{0.2784} \quad (2)$$

$$\sigma_{\text{effective}} = -6.6 + \frac{10}{b \text{ value}} \quad (3)$$

$$(\sigma_3 - \sigma_1) = \frac{b - (1.23 \pm 0.06)}{-(0.0012 \pm 0.0003)} \quad (4)$$

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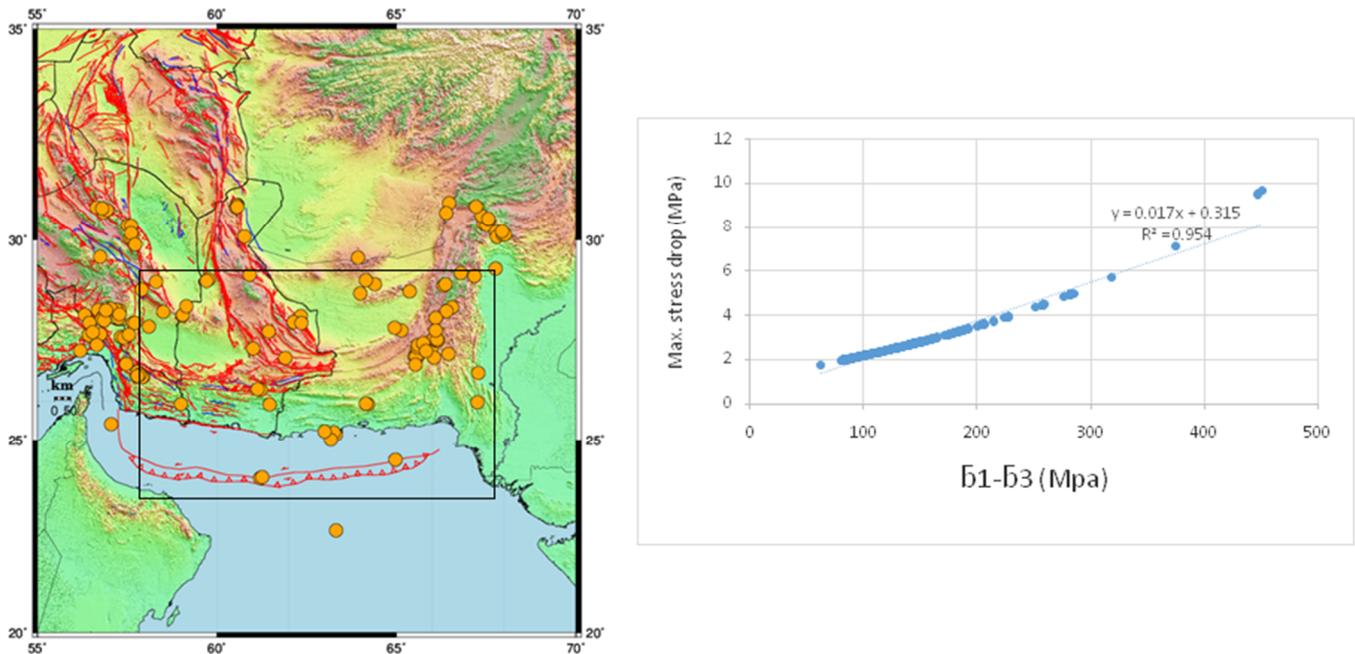


Figure 1. Tectonic map of the study area and differential stress ($\sigma_1 - \sigma_3$) Respect to max. Stress drop data.