

## SOURCE PARAMETERS OF THE APRIL, 16, 2013, SARAVAN IRAN GREAT EARTHQUAKE USING SPECTRA OF P AND S WAVES

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## ABSTRACT

On 16th April 2013 at 10:44 AM UTC, a great earthquake struck the Saravan region in South eastern Iran. The Mw was assessed to be 7.8 and a depth of 63km was assigned by IIEES. According to the deep depth of this event, this event can be associated with subduction of oceanic lithosphere of Arabian plate beneath the Makran ranges. Saravan earthquake was recorded at stations of Iranian National Broad-Band Seismic Network (INSN). In this study we determined source parameters of Saravan earthquake include seismic moment, corner frequency, source radius and stress drop using displacement spectra of P and S waves observed at 16 stations of INSN. The spectra of the records were corrected for attenuation then source parameters retrieved by fitting a Brune's point source model. The average stress drops obtained here for P and S waves are 131 and 149 bars respectively. The larger average values of stress drop estimated for Saravan earthquake in comparison with median stress drop values obtained from previous studies for other regions of Iran can be related to different tectonic setting of the region.

## **INTRODUCTION**

At 10:44 UTC (15:14 local time), April 16, 2013, an earthquake struck the Saravan region in South eastern Iran. The Mw was assessed to be 7.8 and a depth of 63km was assigned by IIEES. The focal mechanism is found to be mostly extension faulting and the fault trend is evidently ENE-WSW The earthquake had reportedly 41 victims and more than 180 injured people. One of the victims was reported from Iran (in the village of Ghader abad of the city of Khash) and the 40 others were reported from Pakistan. According to the deep depth of this event, this event can be associated with subduction of oceanic lithosphere of Arabian plate beneath the Makran ranges (Zare et al, 2013). Makran is part of the coastal territory of Iran and Pakistan and stretches for ~1000 km from the Strait of Hormoz, in the south of Iran, to near Karachi in Pakistan (Fig. 1) (Shah-hosseini et al, 2011). The Makran subduction zone is unusual in several respects: the eastern and western halves of Makran exhibit very different patterns of seismicity, have historic records with and apparently without great events, respectively, and both segments are the site of one of the world's largest forearc region (Byrne et al, 1992). The seismicity associated with the Makran is low compared to other subduction zones, and there is no well-developed Benioff zone apparent (Musson , 2009). Seismicity of the region from 1905 to 2015 is shown in Fig. 2.