AFTERSHOCK DECAY RATES IN THE ZAGROS AND PROBABILISTIC SEISMIC AFTERSHOCK HAZARD ANALYSIS OF THE 2013 APRIL 9 SHONBE (BUSHEHR) EARTHQUAKE

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ABSTRACT

The main goal of this article is to study the Zagros aftershock decay rates. For this propose, the Iranian earthquake catalogue has been collected and homogenized between 2002 to 2014. Eight prominent earthquakes in the Zagros region were selected for aftershock decay rate study. Completeness magnitude and its variation was determined for each event. In order to investigate the behavior of aftershocks in the Zagros seismotectonic province, the Omori law parameters were calculated for selected events. Then, probabilistic aftershock hazard assessment (PAHA) based on aftershock parameters (a, b, P, K) of the 2013 April 9 Shonbe earthquake, has been estimated in temporal duration of 14, 30 and 60 days. In order to evaluate the variation of peak ground acceleration with time in the Zagros region, present attenuation relations and NGA formula has been applied. For calculating the PGA variations with time in 33% probability, we used logic tree for weighing different equation.

INTRODUCTION

Iranian plateau, located in the Alpine-Himalayan belt, has been ruptured by several stem faults. Having concern towards seismicity and the earthquake hazard in such a region is of high significance. Considering the critical point that earthquake phenomenon is divided into three stages, known as: preparation for earthquake (foreshocks), main event, and aftershocks, the design of procedures for identifying and differentiating these stages in the seismic regime can help in better understanding of earthquake phenomenon and consequently can possibly decrease the hazards of earthquake. Working on aftershocks studies can be important from different aspects, the impact that aftershocks have on the destroyed structures which have been damaged in the earthquake from one side, and the disturbance caused in rescue process from another side show the necessity of this study (Hough and Jones, 1997). Among the hazardous aftershocks, we could refer to the M= 5.8 aftershock of the earthquake occurred in Izmir, Turkey (M=7.4), in 1999 which caused 7 dead, aftershock of Hindu kush earthquake (M=6) happened in Afghanistan in 2002, the aftershock (M_N=6.3) of Ahar-Varzaghan earthquake (M_N=6.5) which occurred in Iran 2013. The geographical distribution of aftershocks includes some data and information regarding the geometric expansion of the seismic region, and also it can play a key role in the progress of fault analysis. The mass of aftershocks in one section of fault not