TEMPORAL VARIATION OF V_P / V_S AS A PREQURSORY IN AUGUST 11 , 2012 AHAR – VARZAQHAN EARTHQUAKE

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ABSTRACT

On August 11, 2012, two earthquakes of Mw = 6.5 and Mw = 6.3 took place in part of the Western Alborz seismotectonic province, Ahar-Varzaqhan region.We processed the phase data recorded in 8 seismic stations during 2006-2012 using Wadati method. Temporal variations of Vp/Vs were studied as a tool in earthquake precursory researches in these earthquakes. We impose a number of restrictions on the computation. The number of stations involved in this process is more than 3 and recorded earthquakes with M ≥ Mc. Under these restrictions, the study shows that Vp/Vs in and around Ahar-Varzaqhan study area normal-low-normal process a few months before main shock occurrence.

INTRODUCTION

Changes in vp/vs ratio of a region, can be used as precursor of earthquake occurrence (Whitcomb at al., 1973). A great deal of research has been done on the subject of the speed of seismic waves because the speed of waves is sensitive to stress changes and the characteristics of earth cracks. several case studies with using the arrival time data had been done in the 1970s (Semenov, 1969, Aggarwal at al., 1973, Whitcomb at al., 1973, Robinson at al., 1974). Vp/Vs as an important physical parameter reflects the characteristics of the upper crust in the study area (Lee, 1981). Zhou and Han, 2004 showed that the incidence of fractures caused changes in Vp/Vs. The changes for earthquake prediction accuracy is highly dependent on the reading phase error.

These changes can be the result of the parameters revealing from the change in existing tension in the region before the earthquake (Rainer et al., 2006). Wang et al., 2008 studied changes before and after the earthquake of July 4, 2006 Van An, China at 4 stations. Changes have been reported approximately one year before the earthquake, normal, and then drop back to normal in 4 stations.