

Comparison of structure and size of fault segments of surface ruptures -Turkey, Japan and North America-

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Fault segmentation is an essential procedure for the evaluations both of earthquake generated from active faults and strong ground motion from it. We compare the size of segments of the surface ruptures in different tectonic settings, in North Anatolian fault system, inland Japan, and basin and Range province in North America. The 1999 Izmit and Duzce earthquakes ruptured a 145 km-long, and a 43 km-long portions of the fault system, respectively (Awata et al, 2001; Oner et al., 2000). These earthquake segments are subdivided into six and four segments with an average length of about 20-25 km based on their geometry and slip distribution. These segments are well correlated to the sub-events of source rupture process. In Japan, 16 surface ruptures have appeared since the occurrence of 1891 Mino-Owari earthquake of M 8.0. Each of five surface ruptures, having a length longer than 25 km, consists of two to three segments (Awata, 1999) with an average length of about 20 km, which are identified mainly from paleoseismological data. Seven earthquake segments In the Basin and Range province in North America, are partition into 14 segment of 17 km-long in average (dePolo et al., 1991). The scaling law , which says that an average length of the behavioral segment is about 20-25 km-long, will be applicable to the evaluations both of active fault and strong ground motion from it. Fault segmentation in the pioneering study on active fault evaluation in Kinki district, Japan (Active Fault Research Group of the Geological Survey of Japan, 2000) suggests the usefulness of this scaling law.