

# Application of Observational Seismology to Historical Seismology (1) A pilot seismic observations in the suburbs to investigate regional variations in seismic intensity from the 1855 Ansei Edo-Earthquake

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A pilot program for seismic observation was implemented in the suburbs of Tokyo for two months from September 26 to December 5, 2019. The purpose of the observation is to evaluate the quality of historical documents and regional variations in seismic intensity.

Prior to the observation, following three analyses were performed: (1) judgement of seismic intensity of the historical description about seismic damage, (2) identification of the exact location of the damage described in the document and mapping of seismic intensity, (3) selection of observation points.

As an example of a study on the 1855 Ansei-Edo earthquake, the analyses and results for Narita city are as follows. (1) judgement of seismic intensity of the historical description about seismic damage: based on descriptions of several historical documents, 8 seismic intensities were judged according to Usami (1995), (2) identification of the exact location of the damage described in the document and mapping of seismic intensity: 4 locations were identified by using of old maps, (3) selection of observation points: 10 observation points were selected, including the 3 points identified in (2).

Analysis of several relatively large earthquakes showed that the magnitude relation of calculated seismic intensity among the seismic stations is similar to that of judged seismic intensity of the 1855 Ansei-Edo earthquake. The similarity suggests that the descriptions in the historical documents used in this analysis are reliable and also that the surface geology strongly influences seismic intensity.

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