

Late Quaternary paleoseismic history on the Shonai-heiya-toen fault zone, in northern Honshu, Japan

Shinji Toda[1]; Takashi Azuma[2]; Masashi Omata[3]; takaaki iwasaki[4]; Yorihide Kohriya[5]

[1] Active Fault Research Center, GSJ/AIST; [2] Active Fault Research Center, AIST, GSJ; [3] INA Co.; [4] ias ; [5] INA

To reveal the paleoseismic history and evaluate the future earthquake potential on the Shonai-Heiya-toen fault zone, we have excavated several trenches at three sites across the fault zone. We then found evidence for two surface-rupturing events sometime between ca. 2500 and 4000 yr B.P. on the Kannonji fault that is located on the western part of the fault zone. We also found evidence for three paleoseismic events during the past 40,000 years on the Matsuyama fault that is located on the southeastern part of the fault zone. Together with the other paleoseismic studies and seismic reflection profiles, we conclude that average recurrence interval of the large earthquakes on the Kannonji fault is about 1,000 - 2,000 years which is about a half of the previous estimate, whereas the one on the Matsuyama fault is less active by a factor of ten. This allows us to divide the Shonai-Heiya-toen fault zone into at least two behavioral segments and decrease the maximum magnitude. In terms of the earthquake frequency of M6-7 classes, our study may increase the frequency if one also considers blind thrust activity associated with the surface active folds such as the 2004 Niigata-ken-Chuetsu earthquake.