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Accurate hypocenter determination and seismogenic fault of the 1999 Xiuyan, Liaoning of China earthquake sequence

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On November 29, 1999, an earthquake of M_S 5.9 occurred in Xiuyan, Liaoning of China. This earthquake was followed by a number of aftershocks. To study the characteristics of this earthquake sequence, five mobile seismic stations were installed in and around the epicentral area since August 2004. Several events located in or near to the epicentral area of the Xiuyan earthquake sequence were well recorded by the mobile seismic network and also were recoded, as usual, by regional and local seismic stations in Liaoning. The records obtained from the mobile seismic network were used to improve determination of hypocentral parameters. The hypocenters of the events recorded by the mobile seismic network are used to correct the hypocentral parameters of the Xiuyan earthquake sequence. The pattern of corrected hypocentral distribution of the 1999 Xiuyan earthquake sequence exhibits two clusters. The cluster in the southern part is about 7 km long and 3 km wide, and at a depth of 7 to 13 km, showing a lineation feature trending N60W. The cluster in the northern part is about 6 km long and 1 km wide, and at a depth of 3 to 7 km, shallower than and sub-parallel to the southern cluster. The orientation of the Xiuyan earthquake sequence, which exactly coincides with a local active fault, Oikou-Pianling Fault and focal mechanism of the Xiuyan mainshock suggest that the seismogenic fault of this earthquake was a WNW-striking, left-lateral strike-slip fault, dipping NNE.