

# Integrating PSInSAR and Hydrogeophysical Methods for the Characterization of a Earth fissure in the eastern Beijing plain

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Modern Earth fissure, ranging from renewed displacement on 1-km-long fault scarps to 9.8-km-long tension cracks, occur in the eastern part of Beijing plain. Most of the failures closely parallel the pre-existing Medio-Pleistocene fault zone. The pattern of earth fissure and the relation to the inferred fault remain controversial. An integrated project, including PSInSAR, geophysical and trenching methods, has been conducted to characterize the formation of earth fissure. The results indicate that this earth fissure was caused by groundwater-level decline rather than natural tectonism. In addition, it is the first time to accurately determine the initiation and terminal location of pumping-induced earth fissures within the fault zone.

Keywords: PSInSAR, earth fissure, Hydrogeophysical, fault scarps

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### Abstract

Modern Earth fissure, ranging from renewed displacement on 1-km-long fault scarps to 9.8-km-long tension cracks, occur in the eastern part of Beijing plain. Most of the failures closely parallel the pre-existing Medio-Pleistocene fault zone. The pattern of earth fissure and the relation to the inferred fault remain controversial. An integrated project, including PSInSAR, geophysical and trenching methods, has been conducted to characterize the formation of earth fissure. The results indicate that this earth fissure was caused by groundwater-level decline rather than natural tectonism. In addition, it is the first time to accurately determine the initiation and terminal location of pumping-induced earth fissures within the fault zone.

*Keywords:* PSInSAR; earth fissure; Hydrogeophysical; fault scarps; groundwater; trenching.