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Microseismic survey at the geothermal site GeneSys in Hannover, Germany

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To provide geothermal heat to the office buildings of the Geozentrum Hannover a borehole was drilled to 3900 m depth in the city of Hannover in 2009. The bottom hole temperature reaches 160° C. During hydraulic stimulation in spring 2011 about 20,000 m^3 fresh water was injected to create a heat exchanger within the sedimentary rock of the North German Basin. Since 2009 the operations have continuously been monitored by a seismological network of 13 stations in boreholes down to 200 m and at the surface. Until now no induced seismic event has been observed. A lack of prominent microseismicity has already been observed at the geothermal sites in Groß Schönebeck and Horstberg that are situated in the North German Basin as well. However, the minimum magnitude of seismic events that can be detected depends on the current noise level. We present a method how the detection threshold in terms of radiated seismic energy can be estimated and updated in real-time.