主　論　文　要　旨

論文題名 ：

The surveying groundwater passageways which are factor of surface failures on the slope behind Kiyomizu-dera

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主論文要旨 ：

This thesis disserts a survey of groundwater passageways in the slope behind Kiyomizu-dera to gain insights for predicting and planning countermeasures against slope failure. Location and property information regarding groundwater passageways in steep slopes is valuable, because groundwater passageways, which often occur in areas of subsurface heterogeneity, are susceptible to rainfall seepage, which in turn trigger slope failures.

Chapter 2 of this thesis records temperature and water quality data from February 2010 to September 2011 for two springs at the foot of the slope. The data showed that the two springs had different water qualities and behaved differently after precipitation. These facts indicate that these springs were at different ends of the groundwater passageways.

In Chapter 3, continuous temperature measurements from one meter below the ground surface of the slope from January 2010 to October 2011 show that there were areas repeatedly exhibiting anomalous temperatures, extrapolated to be influenced by the presence of groundwater passageways.

Chapter 4 discusses what may influence these temperature anomalies. The temperatures strongly correlated to the accumulated mean air temperature for 40–50 days. Heavy rain prior to the measurements and the solar radiation seemed to affect one meter deep ground temperatures to some extent, though quantitative determination was not performed. There were no definite relations between the moisture contents of samples from the subsurface ground and one meter deep ground temperatures in the correlation analyses.

Chapter 5 analyzes the assumptions concerning groundwater passageways adopted in the survey. Many groundwater passageways occur in deformed terrains such as gullies or areas with traces of small failures, and are thus susceptible to cave-ins during periods of heavy rain. Such events can result in blocked passageways and lead to destabilization of the surrounding ground. Because of this, groundwater passageways can be important factors in slope failure.