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## SMART TEMPERATURE TRACING USING HEAT AND COLD WATER IN INDIA – VIDEO

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With following the enclosed link to YouTube, you are invited to watch a video about smart temperature tracing with hot and cold water injections in India:

<https://www.youtube.com/watch?v=cx6s4cGj1sc>

### **Abstract**

Sustainable management of groundwater in fractured rocks needs accurate observation data about processes occurring in fractures and rock matrix. Dye tracer tests are commonly used for characterization of these processes. Using temperature as a tracer is more recently used and provides several advantages, including a more detailed investigation of the geological heterogeneity and a more robust interpretation of the mean groundwater velocity. This is an important requirement for more realistic modelling of solute transport in aquifers using informative and robust reference data. In common temperate climate aquifers, characterized by an approximate 10 °C natural background temperature, hot water injections are more and more used, while a cold water injection in hot aquifers is much more promising. This is for example the case in Southern India, with natural aquifer background temperature values around 30 °C. Cold water injections in such environments, enable to increase the difference of temperature between the injected fluid and groundwater. By this way, cold plume transport modelling offers interesting opportunities for aquifers characterization, where heat injections are more limited because of higher natural background groundwater temperature. Within the ENIGMA ITN program, such innovative smart tracer tests with injections of hot and cold water were applied in an isolated fracture within a weathered granite aquifer in Southern India. The tests were performed on a test site located at Choutuppal (Telangana state). It is a scientific observatory of environmental research established within the partnership between the BRGM (Bureau de recherches géologiques et minières) in France and the National Geophysical Research Institute (NGRI) in Hyderabad, India. Based on this cooperation, over 25 borewells are accessible on a small scale.

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### **How to cite the video**

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