

## **Research on Ground-roadway Transient Electromagnetic Method to Detect Disaster Water Source**

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**Abstract** Water irrush accidents were frequent in China. One of the key reasons is that the detection methods are not effective. Integrating the merits of the surface and the mine geophysical methods, we propose a surface-to-roadway TEM to detect mine water irrush source. Numerical simulation, physical experiment and spot test was done to study: 1) time-domain response characters beneath underground half-space; 2) the response rules of hydrogeological abnormalities at different orientation under the surface-to-roadway observation mode; 3) the representation and interpretation method of data. We build basic theory of this method and it is believed that the successful application of this method will enrich mine hydrogeological exploration techniques, improve the technological level of the Mine Water Prevention and Control and provide protection for the mine safety production.

**Keywords** surface-to-roadway TEM, numerical simulation, physical experiment, spot test