

## **TRANSIENT ELECTROMAGNETIC FICTITIOUS WAVE-FIELD 2D MIGRATION IMAGING AND ITS APPLICATION IN CONSTRUCTING TUNNEL**

*Zhipeng Qi, College of Geology Engineering and Geomatics, Chang'an University*

As an electromagnetic induction method, TEM (transient electromagnetic method) is sensitive to low resistivity water bearing fractured zone, and has made some achievements in ahead geological prospecting of constructing tunnels. However, as the geological and hydrogeological conditions encountered in tunnel excavation become more and more complicated, it is difficult to prospect adverse geological bodies resulting water inrush in tunnel construction with complex geological conditions. Thus, there is an increasing need for new interpretation methods that fit to such conditions.

In this paper, the TEM interpretation principle of synthetic aperture imaging is introduced. By combining the TEM wave-field transformation and adopting the correlation superposition method for synthetic aperture process, we have improved the resolution of TEM through the synthetic aperture radar method. The 2D TEM imaging for ahead geological prospecting has been realized by introducing the Kirchhoff integration. The results of imaging and interpretation for measured data have shown that this method is sensitive to geological disasters in front of the tunnel face, and compared with previous methods, the resolution has improved greatly.