

Water multipath effect in Terrestrial Radar Interferometry (TRI) in open-pit mine monitoring

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Abstract

Terrestrial Radar Interferometry (TRI) has established as the reference technology for slope monitoring in the open-pit mining sector. Along with the many benefits this technique provides, there remain some limitations that have not yet been fully resolved by current technology. One of the most curious disturbance factors, is signal interference caused by the reflection of the electromagnetic waves on a water surface. This phenomenon is well known in radio communications and is called multipath propagation. The presence of multipath effects in open-pit mining is not uncommon due to the presence of ponds at the bottom of the pit. In this context, a simulation algorithm has been developed for the evaluation of TRI water multipath, to be able to predict its presence and help monitoring campaign planning. In this work the general characteristics of TRI water multipath are described together with standard mitigation techniques. Furthermore, the simulation algorithm is presented and its application to some real case study is discussed.

Keywords: Terrestrial Radar Interferometry, open-pit mining, multipath, interference, simulation

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