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## InSAR as an operational tool for remote mine monitoring

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Recent mining disasters, such as the collapse of the Brumadinho tailings dam in Brazil, have placed intense pressure on mining companies to effectively monitor their active and historical assets. Particular focus has been placed on none-profit generating aspects of mines, specifically tailings storage facilities (TSFs). These may be poorly monitored, not routinely maintained, and of unknown construction. Remote sensing techniques present an attractive option for monitoring such facilities, reducing the need for the deployment of expensive ground monitoring systems and personnel.

Here we demonstrate how satellite InSAR can be used as an effective remote monitoring solution for both active and inactive TSFs. InSAR is a powerful tool for mining companies, allowing for both frequent ongoing monitoring and, somewhat uniquely, the ability to look at historical deformation and perform post-event analysis. Furthermore, the increasing availability of satellite data, both commercial and open-access, means that regular monitoring programs are increasingly feasible and economically viable.

The application of InSAR across a mine is by no means without challenges. Active sites typically suffer from poor coherence due to mine activities, while closed sites can be heavily vegetated which further impacts coherence. Despite these challenges, InSAR can be a highly effective component of a mine monitoring program, particularly when integrated with ground based systems.