

MONITORING SOLUTION MINING INDUCED SURFACE MOVEMENTS USING SATELLITE BASED RADARINTERFEROMETRY

L. Petrat¹, W.A. Paar²

ABSTRACT

In 2003 a consortium around the company Deutsche Montan Technologie (DMT) and several industrial partners from mining and oil industry launched a project “Earth Observation Market Development for the Mining Sector (EOMD Mining)”. European Space Agency (ESA) funded this project within a program “Earth Observation Market Development (EOMD)”. The goal of the project is the development of a new integrated service for monitoring mining and oil production induced surface movements. This service includes the application of the latest remote sensing monitoring technique of radarinterferometry and the use of a Geographic Information System (GIS) for analysis and interpretation of the monitoring results.

The integrated service has been established and applied to several “Pre-Commercial Projects (PCP)” provided by industrial partners. The PCP “Akzo Nobel” has been conducted in co-operation with the company Akzo Nobel Base Chemicals in Hengelo, Netherlands. This PCP serves as a base for this contribution:

Akzo Nobel Base Chemicals purchased SAR data from ERS-1/2 (acquired between 1995 and 2000) and from Envisat’s ASAR sensor (acquired between 2004 and 2005). The available SAR data have been processed. Surface movements have been determined by the application of the Differential Interferometric SAR (DInSAR) and the Interferometric Point Target Analysis (IPTA) approach. After integration of the results into a Geographic Information System (GIS) further analysis and interpretation in combination with information about the brine field have been made.

Key words: Radarinterferometry, Brinefield, Subsidence, Sinkholes, Instrumentation and Monitoring, Cavern Development