# Experiences of Coal Fire Detection and Quantification for Resources Management

Christian Fischer[1], Stefan Schloemer[2], Andreas Hirner[1], Manfred Teschner[2]

[1]German Aerospace Center, German Remote Sensing Data Center
[2] Federal Institute for Geosciences and Natural Resources

Uncontrolled coal seam fires are an environmental and economic problem of international magnitude. Today, China is the leading country of coal production, consumption and export. The annual Chinese coal production, which is about approx. 2.4 Mt per year, faces a problem of numerous uncontrolled burning coal fires mostly located in the northern Chinese coal belt. Comprehensive studies focuses on two different test sites located in the Autonomous Region of Inner Mongolia, located in the Ningxia Hui Autonomous Region and in Xinjiang. Both areas under investigation are heavily affected by severe coal fires since years on different places within the coalfields. Besides subsurface coal fires, surface coal fires occur directly on outcropping seams and on places where small-scale mining took place.

The determination of fire radiative energy (FRE) has been introduced recently as a new remote sensing technique to quantify forest and grassland fires. The main research in this project focuses on the development of robust routines to detect coal fire related thermal anomalies within the different areas under investigation. The work aims to quantify the amount of radiative energy released by different types of coal fires (CFRE). These developments are the prerequisite for a coal fire monitoring. Developments are based on comprehensive field works to measure the energy release of the topographic surface under different conditions.

This overall aim is to establish remote sensing analysis techniques as an integral method conjointly together with geo-physical measurement techniques and coal fire extinction activities within the framework of the Kyoto Protocol.