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Geophysical Investigations over a Coal Mining Area in China for Risk Assessment of the Expansion of local Coal Seam Fires

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The China Aero Geophysical Survey and Remote Sensing Centre for Land and Resources (AGRS) and the Federal Institute for Geosciences and Natural Resources (BGR), Germany, have performed a helicopter borne survey as joint partners in the Sino-German Coal Fire Research Initiative.

The helicopter borne survey took place in the coal fire area of Wuda, Inner Mongolia, in 2004 and includes all known coal fire locations in that area. More than 300 survey lines were flown with a nominal line spacing of 50 m and a tie line spacing of 250 m. As a new application a complex airborne geophysical equipment like a 6-frequency co-planar/co-axial electromagnetic system was used to verify coal fire locations with airborne methods. Measurements of the Magnetic Total Field complemented the survey system. The detailed processing of the magnetic and electromagnetic data and their interpretation includes maps of the anomalies of the magnetic field and resistivity depth sections. The main objective of the interpretation is focused on the recognition of coal fires by investigating the alteration of resistivities and the magnetic intensities in the area. With respect to the results of the airborne electromagnetic and airborne magnetic survey ground geophysical measurements had been conducted in 2005 to complete the results. The ground geophysical survey was carried out mainly by using the transient electromagnetic method. This method provides information about the electrical conductivity respectively the resistivity of the ground. Besides that a ground magnetic survey gives information about local anomalies of the magnetic total field. Results of the interpretation of the ground and airborne data will be presented.