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PII: S0166-5162(16)30453-0
DOI: doi: 10.1016/j.coal.2016.09.013
Reference: COGEL 2725

To appear in: *International Journal of Coal Geology*

Received date: 9 August 2016
Revised date: 19 September 2016
Accepted date: 19 September 2016

Please cite this article as: Zhou, Binzhong, O'Brien, Graham, Improving coal quality estimation through multiple geophysical log analysis, *International Journal of Coal Geology* (2016), doi: 10.1016/j.coal.2016.09.013

# Improving coal quality estimation through multiple geophysical log analysis

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## ABSTRACT

Coal quality information such as ash content, density, volatile matter and specific energy are important to the coal mining industry for mine planning, design, extraction, processing requirements, beneficiation and, importantly, coal type utilisation and economic value. These parameters are traditionally obtained through laboratory analyses conducted on drill-core samples collected from exploration drill holes. This laboratory process is expensive and time consuming. In this paper, we propose a multi-variable data analysis algorithm based on the Radial Basis Function (RBF) neural network methods to estimate coal quality parameters from routinely-acquired, multiple geophysical logs, such as density, gamma ray and sonic. The performance of this RBF-based approach was demonstrated using both self-controlled training data sets and an independent data set from two mine sites. It was observed that although the density logs play a key role in coal parameter estimation, the use of multiple types of geophysical logs, including logs with different resolutions such as short spaced density log DENB and long spaced density log DENL, improves the estimation accuracy.

Key words: Coal quality; ash content; geophysical logs, Radial Basis Function (RBF).