Geophysical Research Abstracts,
Vol. 11, EGU2009-140, 2009
EGU General Assembly 2009

Estimation of gob gas drainage well productivity

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The methane which comes out of coal mines is valuable source of new energy (for example, utilization of extracted methane to operate gas powered turbines to generate electricity, use as a motor fuel, etc.). This study presents the development and application of new mathematical models for estimation of well productivity during drainage of methane gob gas associated with coal extraction. It is established that the relationship between methane emission from vertical gob gas wells and the duration of well production can be described by Gaussian (Normal) distribution. Mathematical models based on using the Gaussian error distribution function and the Gaussian density function were proposed to describe the correlation between parameters of methane emission from gob gas wells, duration of well production and time coordinate of maximum gas emission. These models predict the total volume of methane which can be extracted for the entire period of well production, the entire period of well production, the maximum volumetric flow rate of gas emission and the time coordinate of maximum gas emission using at least three measurement of gas volumetric rate (or gas volume) from a gas well at any time during the well production period.