



## **Dr. Michael Galetakis**

Professor of Technical University of Crete  
School of Mineral Resources Engineering  
Laboratory of Quality Control – Health and Safety in the  
Minerals Industry

Dr. Michael Galetakis received his Diploma in Mining Engineering from the National Technical University of Athens and his PhD Degree in Surface Mining of Lignite Deposits from the Technical University of Crete, School of Mineral Resources Engineering. He is the director of the Laboratory of Quality Control - Health and Safety in the Minerals Industry and he has taught several [courses](#) in both undergraduate and graduate programs as well as in invited lectures. He has participated in several [research programs](#) either as a scientific coordinator or as a researcher and has published more than 100 [papers](#) in scientific journals, books and conference proceedings. He is also a reviewer in scientific journals and has participated in the scientific or organizing committee of several conferences. Dr. Michael Galetakis is an accredited mining and metallurgical engineer, a [member](#) of the Technical Chamber of Greece and of several European scientific organizations. His [research interests](#) include diverse topics in Quality Control, Mining Systems, Health and Safety and Applications of Machine Learning in the Mineral Sector.

### **Courses**

#### *Undergraduate*

Quality Control of Mineral Resources

MRED 420 Health and Safety in Mining and Underground Works

MRED 523 Computer-Aided Mine Planning and Design

MRED 301 Mineral's Exploitation I (Surface Mining) during 2006-2007 and 2011-2012

#### *Graduate*

G&P 210 Design Principles of Safe Industrial Systems and Equipment

G&P 400 Introduction to Mineral Resources Engineering

### **Research Interests**

Particular aspects include:

- Quality control for the mineral industry (on-line quality control, statistical quality assurance methods, mine planning/production scheduling and quality control).
- Mine planning and design (continuous and conventional surface mining systems, quarrying and reclamation techniques).
- Health and safety in mining, quarrying and constructions (tunnels, excavations).
- Application of simulation techniques, including statistical and geostatistical methods, neural networks, fuzzy and expert systems, in diverse sectors of the mineral industry (exploration, exploitation, quality control, assessment of occupational and environmental risk).

### **Funded Research Projects (2000 - Present)**

1. Characterization and evaluation of quarry dust. Founded by Asphaltiki A.E. Duration: 2001-2002.

2. Investigation of the possibility of production of building stones. Funded by Asphaltiki AE. Duration: 2002-2003.
3. Statistical analysis of the on-line analysers' measurements in the mines of Ptolemaes region. Funded by PPC, program "On-line analysis of coal, Coal Research of RFCS", Duration: 2002-2003.
4. Estimation of the reliability the on-line ash analysers in the mines of Megalopolis area. Funded by PPC, program "On-line analysis of coal, Coal Research of RFCS". Duration: 2003-2005.
5. Quality improvement of mortars and building materials produced by FHL Kyriakidis company by using experimental factorial design. Program CRINNO-RENTS. Duration: 2005.
6. Investigation of the effect of lignite ash composition to the accuracy of the on-line ash analyser and development of techniques for the improvement of its accuracy. Funded by the Research Committee of Technical University of Crete (ELKE). Duration: 2005-2006.
7. Utilization of ultrafine quarry dust for the production of ecological building elements. Funded by the General Secretary of Research and Technology, Program 05PAVET167. Duration: 2006-2007.
8. The use of ultrafine quarry dust for the production of Self Compacted micro ( $\mu$ ) Concrete (SC $\mu$ C). An experimental approach. Funded by the Research Committee of Technical University of Crete (ELKE). Duration: 2008-2010.
9. Sampling and measurement of inhalable and respirable inert and fibrogenic airborne dust in Greek quarries. Funded by Ergoprolipsis O.E. Duration: 2008 – 2009.
10. Noise measurement and mapping in the area of a military airport (115 PM). Funded by the Ministry of Defense. Duration: 2009.
11. Development of a framework for the risk management in aggregate quarries. Funded by Ergoprolipsis O.E. Duration: 2010.
12. Measurement of occupational physical and chemical hazards in industrial areas. Funded by Ergoprolipsis O.E. Duration: 2010-2011.
13. Strategic study for the development of good practices towards the improvement of working environment in Greek Enterprises. Funded by STEGI of Hellenic Federation of Enterprises. Duration 2011-2012.
14. Recycling of quarry dust and construction and demolition wastes for the production of novel ecological building elements- DURECOBEL. Funded by the General Secretary of Research and Technology, Program COOPERATION 2011. Duration: 2013-2015.
15. Development of Mathematical Predictive Model coupled with Neural Network smoothing algorithms to Optimize Operating Conditions and Improve Energy Efficiency of Rotary Kiln and Electric Arc Furnaces in Ferronickel Production Plants (MANNFENI). Funded by the General Secretary of Research and Technology, Program COOPERATION 2011. Duration: 2013-2015.
16. Bucket wheel excavators operating under difficult mining conditions including unmineable inclusions and geological structures with excessive mining resistance (BEWEXMIN). Funded by the European Commission, Research Fund for Coal and Steel. Duration 2015-2018.

### **Selected Publications**

- [Papers on Quality Control for the Minerals Industry](#)
- [Papers on Application of Stochastic Methods, Simulation and AI Techniques \(Fuzzy, Neural Networks\)](#)
- [Papers on Health and Safety in Mining and Quarrying](#)
- [Papers on Mine Planning and Design/Reclamation](#)

## **Distinctions**

- Outstanding teaching award for the academic year 2015-2016.
- Reviewer in several national and international journals (Minerals, Journal of Coal Geology, Energy Sources, Journal of Simulation Practice and Theory, Environmental Engineering and Management, Construction and Building Materials, LNCS-AIE, Mining and Metallurgical Annals, Technical Chronicles-Scientific Journal of Technical Chamber of Greece).
- Member of the editorial board of the honorary edition of late Prof. K. Kavouridis.
- Invited lectures, University of Bari, Italy, 2008: “Quarry dust utilization for building and construction application”.
- Invited lectures, University of Wroclaw, Poland, 2011: “Statistical quality control methods in engineering and geosciences” and “Application of AI technologies (artificial neural networks and fuzzy logic) in minerals industry”
- Session chairman of SDIMI 2005, Conference on Sustainable Development Indicators in the Minerals Industry, Aachen, Germany.
- Participation in the National Scientific Committee of “AMIREG 2004 – Advances in Mineral Resources Management and Environmental Geotechnology”, Chania, Greece, 2004.
- Session chairman of APCOM 2002 - Int. Symposium Computer Application in the Mineral Industries.
- Participation in Organizing Committee of IGCP 276, International Geological Correlation Program, Chania, 1988.
- Lasithiotakis fellowship (1978) for graduate studies.

## **Member of organizations**

- Technical Chamber of Greece
- Hellenic association of mining and metallurgical engineers
- Mineral wealth technologists
- European technological platform for industrial safety

## **Quality Control for the Minerals Industry**

1. M. Galetakis, K. Leventakis and G. Alevizos, 2012, ‘Evaluation of fine limestone quarry by-products, for the production of building elements- an experimental approach’, *Construction & Building Materials*, 26, 122–130.
2. M. Galetakis, C. Roumpos, 2010, ‘The effect of quality and reserves uncertainty on the production scheduling of a lignite mine feeding a power plant’, *Sixth International Conference on Sensitivity Analysis of Model Output, Procedia Social and Behavioral Sciences* 2, 7654–7655 (Extended summary).
3. D. Vanvuka and M. Galetakis, ‘Carbon Dioxide Emissions from Coal-fired Power Plants in Greece in Relation to Mined Lignite Quality’, *Energy and Fuels*, 24, 1396–1401, 2010.
4. M. Galetakis & F. Pavludakis, ‘The effect of lignite quality variation on the efficiency of the on-line ash analyzers’, *Int. Journal of Coal Geology*, 80, 145-156.
5. M. Galetakis, G. Alevizos, F. Pavludakis, C. Roumpos and C. Kavouridis, ‘Prediction of the performance of on-line ash analysers used in the quality control process of a coal mining system’, *Energy Sources:Part A*, 31, 1127–1142, 2009.
6. Galetakis, D. Vamvuka, C. Roumpos and F. Pavludakis, ‘Prediction of annual CO<sub>2</sub> emissions of lignite mined from the South Field Mine, Greece’, *Proced. of the 3rd AMIREG International Conference (2009): Assessing the Footprint of Resource Utilization and Hazardous Waste Management*, Athens, Greece, 177-182.
7. M. Galetakis, K. Leventakis and G. Alevizos, ‘Characterization of quarry fines for recycling uses in construction’, *Proced. of the 3rd AMIREG International Conference (2009): Assessing the Footprint of Resource Utilization and Hazardous Waste Management*, Athens, Greece, 125-130.

8. K. Leventakis and M. Galetakis, 'Utilization of fine quarry by-products for the production of building elements by extrusion - an experimental approach', *Proced. of the 3rd AMIREG International Conference (2009): Assessing the Footprint of Resource Utilization and Hazardous Waste Management*, Athens, Greece, 258-264.
9. K. Kavouridis, C. Roumpos and M. Galetakis, 2007, 'The effect of power plant efficiency, lignite quality and inorganic matter on CO<sub>2</sub> emissions and the competitiveness of Greek lignite', *Mining and Geoengineering*, 31(2), 355-369.
10. A. Pavlidis, D.T. Hristopoulos and M. Galetakis, 'Prediction of long-term quality fluctuations in the South Field lignite mine of West Macedonia', *Proced. of the 2nd International Symposium on Advances in Mineral Resources Management and Environmental Geotechnology*, Hania 2006, Greece, 163 - 168.
11. M. Galetakis, C. Kavouridis, A. Kouvata, C. Roumpos, F. Pavloudakis, O. Kouridou and K. Stamoulis, 'The Effect of Tectonics on Quality Variation of Lignite Mined from Southern Field Mine of Ptolemaes – Greece', *Proced. of the International Symposium on Mine Planning and Equipment Selection (eds Cardu, Ciccu, Lovera & Michelotti)*, Torino 2006, Italy, 1106-1111.
12. M. Galetakis, F. Pavloudakis, C. Roumpos (2005), 'The contribution of the on-line coal analysers to the sustainability of the Greek lignite mining sector', *Proced. of 2nd Int. Conference on Sustainable Development Indicators in the Minerals Industry (SDIMI 2005)*, May 18th - 20th, 2005, Aachen, Germany, 819-828.
13. G. Alevizos, M. Galetakis, 'Mineralogical study of anhydrite-gypsum occurrence in the area of Vathi at western Crete – quality variation and mining particularities', *Mining and Metallurgical Annals*, 15(1), 83-102, 2005. (in Greek with English summary)
14. K. Papanicolaou, M. Galetakis, A. Foscolos, 2005. 'Quality characteristics of greek brown coals and their relation to the applied exploitation and utilization methods', *Energy and Fuels*, 19(1), 230-239.
15. M. Galetakis, K. Papanicolaou, 'Estimation of the effect of partings on the quality of the recoverable lignite mined from multiple-layered deposits' *Bulletin of the Geological Society of Greece*, vol. XXXVI, 274-282, 2004. (in Greek with English abstract)
16. M. Galetakis and S. Raka, 2004, 'Assessment of limestone quarry dust by using factorial design of experiments', *Proceedings of the International Symposium on Advances in Mineral Resources Management and Environmental Geotechnology*, Hania 2004, Greece, pp. 685-689.
17. M. Galetakis and G. Alevizos, 2004, 'The effect of the inorganic matter of lignite on the accuracy of the on-line quality analyzer', *Proceedings of the International Symposium on Advances in Mineral Resources Management and Environmental Geotechnology*, Hania, Greece, pp. 663-668.
18. D. Vamvuka, M. Galetakis F. Pavloudakis and K. Kavouridis, 2004, 'Methods of upgrading and controlling the quality of lignite mined from West Macedonia Lignite Centre', *Proceedings of the International Symposium on Advances in Mineral Resources Management and Environmental Geotechnology*, Hania, Greece, pp. 647-654.
19. M. Galetakis and D.T. Hristopoulos, 2004, 'Prediction of long-term quality fluctuations in the South Field lignite mine of West Macedonia', *Proceedings of the International Symposium on Advances in Mineral Resources Management and Environmental Geotechnology*, Hania, Greece, pp. 133-138.
20. M. Galetakis, S Raka, 2004, 'Utilization of limestone dust for artificial stone production. An experimental approach', *Int. Journal of Minerals Engineering*, 2, 355-357.
21. F. Pavloudakis, M. Galetakis, Z. Agioutantis and K. Kavouridis, 'Evaluation of on-line quality analyzer results, during its trial operation at Western Macedonian Lignite Mines', *Technical Chronicles, Scientific Journal of the Technical Chamber of Greece*, vol. 1&2, 27-38, 2003. (in Greek with English extended summary)
22. M. Galetakis, G. Alevizos, 2003, 'On-line monitoring of lignite quality in relation to ash mineral matter', *Berichte der Deutschen Mineralogischen Gesellschaft*, No.1, pp. 60.

23. M. Galetakis, G. Alevizos, 2002, 'Preliminary quality assessment of West Crete gypsum-anhydrite deposit, based on mineralogical analysis', *Berichte der Deutschen Mineralogischen Gesellschaft*, No.1, pp. 48.
24. Th. Markopoulos, M. Galetakis, 2001, 'Investigation of stones used for restoration/reconstruction of the Church of Saint Peter Dominican, Heraklion-Crete', *Acta Universitatis Carolinae, Geologica*, 45(1), 151-157.
25. M. Galetakis, 'Quality Control for multivariate correlated observations. The case of the South Field lignite mine at Ptolemaes area', *Mineral Wealth*, 119, 35-44, 2001.
26. Th. Markopoulos, M. Galetakis, 2000, 'Mortars used for restoration of Saint Peter Dominican Church, Heraklion-Crete', *Proceedings of the International Congress Quarry – Laboratory – Monument*, Pavia, 26-30 Sept., pp. 425-430.
27. E. Mystakidou, M. Galetakis, 2000, 'Preliminary investigation of the waste layers mined from Ptolemaes area lignite mines, as raw material for the ceramic industry', *DTTG-2000, Jahrestagung der Deutschen Ton und Tonmineralgruppe*, Zurich, 30 August – 1 September, pp. 34.
28. M. Galetakis, Z. Agioutantis, 2000, 'The influence of strategic development options on the longterm quality variation of (mined) lignite - the case of the South Field Mine in Ptolemaes – Greece', *Proceedings of the Ninth International Symposium on Mine Planning & Equipment Selection, (MPES)*, Athens 6-9 November, pp. 57-62.
29. E. Mistakidou, M. Galetakis, 'Quality characteristics and possible uses of Western Rhodopi pegmatitic feldspars' *Proceedings of the 3rd Conference of the Technical Chamber of Greece for the Mineral Wealth*, 22-24 November, Athens, vol. A, 69-76, 2000.
30. K. Kavouridis, M. Galetakis, 'Determination of the dilution of the exploitable lignite mined from multiple-layered deposits', *Proceedings of the 1st Conference of the Society of Economic Geology of Greece: Mineral Wealth and Environment in Western Macedonia*, 12-13 February, Kozani, 158-176, 2000.
31. M. Galetakis, K. Kavouridis, 'Homogenization of the Quality of Lignite Mined from the Ptolemaes – Amynteon Lignite Basin', *Technical Chronicles, Scientific Journal of the Technical Chamber of Greece*, vol. 1&2, 41-52, 1999. (in Greek with English extended summary)
32. C. Kavouridis, M. Galetakis, 'Determination of the lignite quality produced in Ptolemaes open cast mines for power generation', *Fuel and Energy Abstracts*, 37(5), 330, 1996.
33. C. Kavouridis, M. Galetakis, 'Determination of lignite quality produced in Ptolemaes open cast mines for power generation', *Mineral Wealth*, 98, 25-42, 1996. (in Greek with English extended summary)
34. M. Galetakis 'Determination of lignite quality mined from multiple-layered deposits by applying continuous opencast methods", *PhD Thesis, Technical University of Crete*, 262 p., 1996. (in Greek)
35. Th. Markopoulos, M. Galetakis 1995, 'Quarrying activities in Crete and aggregates quality', *Workshop of Technical Chamber of Greece on Extraction and handling of aggregates in Greece*, 5 May, Athens 1995.
36. G. Kostakis, E. Mystakidou, M. Galetakis, G. Alevizos, 'Mineral matter of lignite used in P.P.C. Briquetting Plant at Ptolemaes (Greece)', *Berichte der Deutschen Mineralogischen Gesellschaft*, No.1, pp. 151, 1994.
37. M. Galetakis, 'Laboratory test for aggregates', *Seminar of the Geotechnical Chamber of Greece-Western Crete Division on Engineering Geology*, 1992.

## **Health and Safety in Mining and Quarrying**

1. M. Galetakis, G. Alevizos and I. Aspirtakis, 'Crystalline silica dust determination in limestone aggregate quarries in Greece', *Proced. of the 3rd AMIREG International*

- Conference (2009): Assessing the Footprint of Resource Utilization and Hazardous Waste Management, Athens, Greece, 113-118.
2. I. Aspirtakis, M. Galetakis, 'Occupational risk assessment and best practices in aggregate quarries', Proceedings of the 1st Greek Conference in Construction and Building materials, 21-23 May 2008, Athens, vol. B, 829-841, 2008.
  3. Aspirtakis, M. Galetakis, 'Occupational risk assessment in quarry industries and best practices', Quarry magazine, vol. 8, 44-50, 2008. (in Greek)
  4. Aspirtakis, K. Vrodakis, M. Galetakis, 'Not all quarry dusts are the same: the crystalline silica', Quarry magazine, vol.10, 58-63, 2008. (in Greek)

### **Application of Stochastic Methods, Simulation and AI Techniques (Fuzzy, Neural Networks)**

1. M. Galetakis, C. Roumpos, G. Alevizos and D. Vamvuka, 2011 'Production scheduling of a lignite mine under quality and reserves uncertainty', Reliability Engineering & System Safety, 96, 1611–1618.
2. M., Galetakis and A., Vasiliou, 2011, 'Applications of Fuzzy Inference Systems in Mineral Industry- Overview', In: Expert System Software: Engineering, Advantages and Applications, Editors: Jason M. Segura and Albert C. Reiter, Nova Science Publishers, 211-226.
3. M. Galetakis and A. Vasiliou, 2010, 'Selective mining of multiple-layer lignite deposits. A fuzzy approach', Expert Systems with Applications, 37, 4266–4275.
4. M. Galetakis and D. Vanvuka, 2009, 'Lignite quality uncertainty estimation for the assessment of CO<sub>2</sub> emissions', Energy & Fuels, 23, 2103–2110.
5. M. Galetakis, A. Vasiliou, C. Roumpos and F. Pavloudakis, 2006, 'Calibration of on-line ash analyzers using Adaptive Neuro-Fuzzy Inference Systems (ANFIS)', Proceed. of the 2nd International Symposium on Advances in Mineral Resources Management and Environmental Geotechnology, Hania 2006, Greece, 177-182.
6. M. Galetakis, A. Vasiliou, C. Roumpos, F. Pavloudakis, 2005, 'Developing Fuzzy Inference Systems (FIS) for the evaluation of multiple-layer lignite deposits', Int. Workshop, Geoenvironment and Geotechnics (GEOENV 2005), Sept. 12th - 14th, 2005, Milos, Greece, 99-104.
7. M. Galetakis, G. Alevizos, 2004. 'Forecasting electric coal quality by using artificial neural networks', Berichte der Deutschen Mineralogischen Gesellschaft, No1, pp 42.
8. M. Galetakis, K. Theodoridis, O. Kouridou, 2002, 'Lignite Quality Estimation Using Artificial Neural Networks (ANN) and Adaptive Neuro-Fuzzy Inference Systems (ANFIS)', Proceedings of the Int. Symposium Computer Application in the Mineral Industries (APCOM), Phoenix, Arizona, USA, February 25-27, pp. 425-432.
9. M. Galetakis, Th. Markopoulos, G. Christidis, E. Repouskou, G Alevizos, 2000, 'Prediction of aggregates quality characteristics by using Artificial Neural Networks' Proceedings of the 3rd Conference of the Technical Chamber of Greece for the Mineral Wealth, 22-24 November 2000, Athens, vol. A, 571-577.
10. M. Galetakis, 1999, 'Improving lignite quality estimation using artificial neural networks techniques', New Technologies for Coal Quality Control and Homogenization, International Workshop, Thermie Program, Europ. Com. DG XVII Energy, Athens.
11. M. Galetakis, "Application of artificial neural networks in solving problems related to open pit mine planning and design", Mineral Wealth Vol. 113, pp. 47-56, 1999. (in Greek with English extended summary)
12. M. Galetakis C. Kavouridis, 1998, "Quality Control of Lignite Produced by Continuous Surface Mining, using Statistical Methods", Technical Chronicles, Scientific Journal of the Technical Chamber of Greece, vol. 1&2, 49-61, 1988. (in Greek with English extended summary)

13. M. Galetakis, 1998, 'Evaluation of multiple seam lignite deposits of Ptolemaes area, using statistical methods', *Mineral Wealth*, 107, 55-64.
14. M. Galetakis, 1997, 'Determination of the dilution of lignite during selective mining with bucket wheel excavators, using neural networks techniques', *MineIT' 97*, 1st International Conference on Information Technologies in the Mineral Industry via Internet, Ed. G. Panagiotou, AA Balkema, Rotterdam.
15. M. Galetakis C. Kavouridis, 1996 'A statistical approach to the quality of Ptolemaes multi-seam lignite deposits and its effect on selective mining', XV Congress of the Carpatho-Balkan Geological Association, Sept. 17-19 Athens, Abstracts pp. 19-20.
16. M. Galetakis, 'Application of expert systems in Geosciences', Workshop of the Geotechnical Chamber of Greece-Western Crete Division on Application of Information Technologies in Geology, 13-14 May, 1992.

### **Mine Planning and Design/Reclamation**

1. M. Galetakis, C. Roumpos, F. Pavloudakis, 'Determination of the optimal exploitable lignite blocks to be mined by bucketwheel excavators', honorary edition for Prof. Kavouridis, Chania, 43-56, 2010. (in Greek with English abstract)
2. F. Pavloudakis, C. Roumpos, C. Sahanidis and M. Galetakis, 'Development of a new framework for the environmental management of the lignite mines in the Ptolemais basin', honorary edition for Prof. Kavouridis, Chania, 171-180, 2010. (in Greek with English abstract)
3. F. Pavloudakis, M. Galetakis & C. Roumpos, 2009, 'A spatial decision support system for the optimal environmental reclamation of open-pit coal mines in Greece', *Int. Journal of Mining, Reclamation and Environment*, 23(4), 291 – 303.
4. C. Roumpos, F. Pavloudakis and M. Galetakis, 'Optimal production rate model for a surface lignite mine', *Proced. of the 3rd AMIREG International Conference (2009): Assessing the Footprint of Resource Utilization and Hazardous Waste Management*, Athens, Greece, 360-365.
5. K. Kavouridis, C. Roumpos, M. Galetakis & F. Pavloudakis, 'Methods and Technological Improvements for the Efficient Removal of the Overburden Hard Rock Formations at South Field Lignite Mine, Ptolemais, Greece', *Proced. of 9th International Symposium 'Continuous Surface Mining'*, 8-11 October 2008, Petrosani – Romania, 91-100.
6. K. Kavouridis, M. Galetakis, F. Pavloudakis and A. Filiou, 'Energy and environmental policy: Two sides of the same coin. The approach of the coal extraction industry for the development of emissions trading after 2012', *Proced. of the Int. Workshop, Geoenviroment and Geotechnics (GEOENV)*, Sept. 12th – 14th, 2008, Milos, Greece, 221-230.
7. C. Roumpos, F. Pavloudakis and M. Galetakis, 'Benchmarking and sustainability indicators for surface mining operations', *Proced. of 3rd Int. Conference on Sustainable Development Indicators in the Minerals Industry (SDIMI)*, June 17th – 20th, 2007, Milos, Greece, 295-300.
8. F. Pavloudakis, C. Roumpos, C. Sahanidis and M. Galetakis, 'Environmental impacts assessment of surface mining operations: a review of the Greek experience', *Proced. of the International Symposium on Mine Planning and Equipment Selection (eds Cardu, Ciccu, Lovera & Michelotti)*, Torino 2006, Italy, 1106-1111.
9. F. Pavloudakis, C. Roumpos and M. Galetakis, 'Critical environmental and social parameters affecting the development of new surface mines', *Proced. of the 2nd International Symposium on Advances in Mineral Resources Management and Environmental Geotechnology*, Hania 2006, Greece, 177-182.
10. C. Roumpos, F. Pavloudakis, M. Galetakis (2005), 'Modelling and evaluation of open-pit lignite mines exploitation strategy', *Proced. of 2nd Int. Conference on Sustainable Development Indicators in the Minerals Industry (SDIMI 2005)*, May 18th - 20th, 2005, Aachen, Germany, 141-150.

11. F. Pavloudakis, C. Roumpos, M. Galetakis, (2005), 'Comparing investment options in a lignite deposit exploitation project', *Proced. of Int. Workshop, Geoenvironment and Geotechnics (GEOENV 2005)*, Sept. 12th - 14th, 2005, Milos, Greece, 229-234.