

Department of Energy Resources Engineering

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1. Introduction

The Department of Energy Resources Engineering offers graduate programs leading to the Master of Engineering and the Doctor of Philosophy (Ph.D) degrees. The Department aims to cultivate creative global leaders with an international level of expertise who understand mineral resources, conventional & unconventional energy resources, the resource economy and its policy, as well as the fields of exploration, development, production, environment, safety and pollution prevention of mineral and fossil energy resources. Our faculty members, some of the Korea's finest, will take the lead in cultivating outstanding engineers who will contribute to the development of advanced technologies in the mineral and energy resource fields. The Department of Energy Resources Engineering was created by the Korea Energy and Mineral Resources Engineering Program as the authority on resource development in 2009.

2. Majors

Energy Resources Engineering

3. Faculty Members

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* Educational Background:

- Ph.D.: Resources Environment / University of Missouri-Rolla / U.S.A

- M.S.: Ventilation / University of Kentucky / U.S.A

* Research Area: HSE (Health and Safety, Environment) for resources development, ventilation, underground space environment, north korea mineral resources

* Academic Works:

- An evaluation of factors influencing drag coefficient in double-deck tunnels by CFD simulations using factorial design method, JOURNAL OF WIND ENGINEERING AND INDUSTRIAL AERODYNAMICS, 180, pp. 156~167, 2018.

- Review of Environmental Monitoring and Communication System in Underground Mines Using Wireless Sensor Network, TUNNEL AND UNDERGROUND SPACE, Vol.28 No.1, pp111~124, 2018.

- Numerical Analysis on the Estimation of Shock Loss for the Ventilation of Network-type Double-deck Road Tunnel, TUNNEL AND UNDERGROUND SPACE, Vol.27 No.3, pp132~145, 2017.

- A study on the Determination of Shock Loss Coefficient on the Branch in the Double-deck Road Tunnel for Small Car, TUNNEL AND UNDERGROUND SPACE, Vol.27 No.1, pp50!57, 2017.

- Ventilation Efficiency Evaluation of Domestic Limestone Mine Using Tracer Gas Method, TUNNEL AND UNDERGROUND SPACE, Vol.26 No.4, pp274~282, 2016.

- Design Factors for the Ventilation System of a Networked Double-deck Tunnel, TUNNEL AND UNDERGROUND SPACE, Vol.26 No.1, pp32~45, 2016.

- A Study on the Improvement of Temperature Environment for Domestic Deep Coal Mines, JOURNAL OF THE KOREAN SOCIETY OF MINERAL AND ENERGY RESOURCES ENGINEERS, Vol.52 No.1, pp9~19, 2015.

- A Study on the Economic Evaluation for a Feasibility Study in Molybdenum Mineral Processing, THE RESOURCES PROCESSING SOCIETY OF JAPAN, Vol.61,

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- Hydraulic Activity and Synthetic Characteristics of Precipitated Calcium Carbonate according to Geological Properties of Limestone, THE RESOURCES PROCESSING SOCIETY OF JAPAN, Vol.61 ,pp26~31 , 2014.
- A Study on Evaluation of Thermal Environment using Heat Stress Indices for Deep Coal Mine in Korea, TUNNEL AND UNDERGROUND SPACE, Vol.24 No.2, pp166~175, 2014.
- An Exploratory Research on PCC Application of Crystalline Limestone: Effects of Limestone Crystallographic Characteristics on Hydraulic Activity, JOURNAL OF THE KOREAN CERAMIC SOCIETY, Vol.51 No.2, pp115~120, 2014
- A Study on Thermodynamic Natural Ventilation Analysis by the Field Survey of Underground Mines in Korea, TUNNEL AND UNDERGROUND SPACE, Vol.23 No.4, pp288~296, 2013.
- An Experimental Study Regarding the Determination of Seasonal Heat Transfer Coefficient in KURT by Convection Conditions, SAFETY SCIENCE, pp, 2013.
- A Study on the Prediction of HLW Temperature from Natural Ventilation Quantity using CFD, TUNNEL AND UNDERGROUND SPACE, Vol.22 No.6, pp429~437, 2012.
- A Study on the Airflow Distribution in the Diagonal Ventilation Circuit for the Design of a High Level Radioactive Waste Repository, TUNNEL AND UNDERGROUND SPACE, Vol.22 No.3, pp173~180, 2012.
- A Study on Natural Ventilation by the Caloric Values of HLW in the Deep Geological Repository, TUNNEL AND UNDERGROUND SPACE, Vol.21 No.6, pp518~525, 2011.
- A Study on the Determination of the Seasonal Heat Transfer Coefficient in KURT Under Forced Convection, Journal of the Korean Radioactive Waste Society, Vol.8 No.3, pp189~199, 2010.
- An Experimental Study of Smoke Extraction Efficiency Along With Ventilation Building Location in the Road Tunnel, TUNNEL TECHNOLOGY, Vol.12 No.3, pp215~222, 2010.
- Determination of the Applicable Exhaust Airflow Rate through a Ventilation Shaft in the Case of Road Tunnel Fires, SAFETY SCIENCE, pp722~728, 2010.
- Experimental Study on the Determination of Heat Transfer Coefficient for the KURT, TUNNEL AND UNDERGROUND SPACE, Vol.19 No.6, pp507~516, 2009.
- An Experimental Study On The Change Of Air Velocity With Respect To The Location And Size Of Regulators For Diagonal Ventilation System, TUNNEL AND UNDERGROUND SPACE, Vol.19 No.1, pp11~18, 2009.

- Two-Level Factorial Analysis Used to Optimise Dust Suppression Parameters, TRANSACTIONS OF THE INSTITUTION OF MINING AND METALLURGY SECTION A-MINING TECHNOLOGY, Vol.117 No.4, pp173~177, 2008.
- Temperature Prediction of Underground Working Place Using Artificial Neural Networks, TUNNEL AND UNDERGROUND SPACE, Vol.17 No.4, pp301~310, 2007.
- A Study of Efficient Ventilation Management in Hwa-Soon Colliery, Journal of the Korean society for geosystem engineering, Vol.44 No.5, pp364~375, 2007.
- A Study on Ventilation System of Underground Low-Intermediate Radioactive Waste Repository, Journal of the Korean Radioactive Waste Society, Vol.5 No.1, pp65~78, 2007.
- An Experimental Study on the Smoke-Spread Region Before Reaching the Critical Velocity for the Case of Fires in Tunnels Employing Longitudinal Ventilation System, TUNNEL AND UNDERGROUND SPACE, Vol.16 No.6, pp526~535, 2006.
- Model Test for the Determination of Distances between Jet-fans and Analysis of Recirculation, TUNNEL TECHNOLOGY, Vol.8 No.4, pp335~344, 2006.
- The Evaluation of Natural Ventilation Pressure in Korean Long Road Tunnels with Vertical Shafts, TUNNELLING AND UNDERGROUND SPACE TECHNOLOGY, Vol.21, pp472, 2006.
- Experimental Study on the Determination of Critical Velocity for the Case of Fire in Long Traffic Tunnels, TUNNEL AND UNDERGROUND SPACE, Vol.16 No.1, pp85~94, 2006.
- The Feasibility of Natural Ventilation in Radioactive Waste Repository Using Rock Cavern Disposal Method, KOREAN RADIOACTIVE WASTE SOCIETY, Vol.3, pp183~192, 2005.
- Ventilation System Strategy for a Prospective Korean Radioactive Waste Repository, KOREAN RADIOACTIVE WASTE SOCIETY, Vol.3, pp135~148, 2005.
- Effect of Temperature Variation on a Rock Salt Deformation - a Case Study, TRANSACTIONS OF THE INSTITUTION OF MINING AND METALLURGY SECTION A-MINING TECHNOLOGY, Vol.114, ppA89, 2005.
- Experimental Study on the Effect of Exhaust Ventilation by Shafts for Case of Fire in Long Traffic Tunnels, TUNNEL TECHNOLOGY, Vol.7 No. 1, pp27~36, 2005.
- Experimental Study on the Interval of Emergency Exits in Long Traffic Tunnels, TUNNEL AND UNDERGROUND SPACE, Vol.15 No. 1, pp61~70, 2005.
- The Estimation and Application of Optimum Design Variables for Road Tunnel Ventilation System Based on Statistical Analysis, TUNNEL AND UNDERGROUND SPACE, Vol.14 No. 5, pp373~380, 2004.

- The Application of Artificial Neural Network to the Prediction of Pollutant Concentration in Road Tunnels, TUNNEL AND UNDERGROUND SPACE, Vol.13 No.6, pp1~10, 2003.
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- A Study on the Cooling Methods for Deep Coal Mines, Journal of the Korean Society of Mineral and Energy Resources Engineers, Vol.38 No.6, pp, 2001.
- The Application of Surfactants to the Suppression of Fugitive Dust Generated from the Scrap Metal Loading Field in Inchon Port and Preliminary Evaluation on Their Wetting Capability, Journal of Korean Society for Atmospheric Environment, Vol.17 No.1, pp85~96, 2001.
- A Study on the Improvement of Ventilation System in Jang-Sung Colliery, Journal of the Korean Society of Mineral and Energy Resources Engineers, Vol.37 No. 3, pp173~180, 2000.
- Effect of Operating Parameters of a Liquid Spray on Coal Dust Suppression, CIM BULLETIN, Vol. 93, N 1040, pp72~75, 2000.
- The Analysis of Temperature Environment and Ventilation in Subway System, Journal of the Society of Air Conditioning and Refrigerating Engineers, Vol.28 No. 6, pp, 1999.
- A Preliminary Study on Air Pressure Transients in High Speed Train Tunnels, Journal of the Korean Society of Mineral and Energy Resources Engineers, Vol.36 No. 4, pp276~282, 1999.
- Effect of Coal Dust Type on Wetting by Solutions of Nonionic Surfactant, International Mining & Minerals (IMM-The Institution of Mining and Metallurgy), Vol. 2, No. 14, pp38~41, 1999.
- Respirable Coal Dust Control Using Surfactants, Applied Occupational and Environmental Hygiene, Vol. 12, No. 12, pp957~963, 1997.
- Effect of Scrubber Operation Parameters on Droplet Size, Droplet Velocity and Dust Suppressibility, Environmental Engineering Research, Vol. 2, No. 4, pp279~286, 1997.
- The Economic Assessment of Surfactant Applications for Coal Dust Control in USA Mines, MINING technology, IME, Vol. 79, No. 909, pp133~136, 1997.
- The Effect of Added Base on Coal Wetting Ability of Nonionic Surfactant Solutions Used for Dust Control, The Mining Engineer, IME, Vol. 154, No. 399, pp151~155, 1994.

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* Educational Background:

- Ph.D.: Rock mechanics/University of Missouri-Rolla/U.S.A

- M.S.: Rock mechanics/Seoul National University/Korea

* Research Area: Rock excavation, tunnel, blasting, underground storage facilities,
coal mines and mineral development technologies

* Academic Works:

- An Evaluation of the Influence of the Rock Property Change under Saturated-Loading Conditions on Rock Stability, J. Korean Soc. Miner. Energy Resour. Eng., vol.52, pp.309-321, 2015

- Assessment of Rock Slope Stability and Factor Analysis with a Consideration of a Damaged Zone, TUNNEL AND UNDERGROUND SPACE, vol.24, pp.187-200.

- Variation of Thermal and Mechanical Properties of Crystalline Granite under Saturated-Loading Condition, TUNNEL AND UNDERGROUND SPACE, vol.24, pp.224-233.

- Sensitivity analysis of tunnel stability with a consideration of an excavation damaged zone, Korean tunneling and underground space association, Vol.16 No.1, pp89~102, 2014.

- Analysis of time-dependent deformation measured at deep underground openings, GEOSYSTEM ENGINEERING, Vol.16 No.4, pp296~304, 2013.

- In situ borehole heater test at the KAERI Underground Research Tunnel in granite, ANNALS OF NUCLEAR ENERGY, Vol.62, pp, 2013.

- A study on the temperature distribution of rock mass at KAERI underground research tunnel"verification on the result of borehole heater test, TUNNEL AND UNDERGROUND SPACE, Vol.23 No.4, pp297~307, 2013.

- Thermo-mechanical coupling analysis of APSE using submodels and neural networks, Journal of Rock Mechanics and Geotechnical Engineering, Vol.5, pp32~43, 2013.

- AN ANALYSIS OF THE THERMAL AND MECHANICAL BEHAVIOR OF ENGINEERED BARRIERS IN A HIGH-LEVEL RADIOACTIVE WASTE REPOSITORY, Nuclear Engineering and Technology, , pp41~52, 2013.

- An experimental study regarding the determination of seasonal heat transfer coefficient in KURT by convection conditions, SAFETY SCIENCE, Vol.51, pp241~249, 2013.
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- MODELING THE HYDRAULIC CHARACTERISTICS OF A FRACTURED ROCK MASS WITH CORRELATED FRACTURE LENGTH AND APERTURE: APPLICATION IN THE UNDERGROUND RESEARCH TUNNEL AT KAERI, Nuclear Engineering and Technology, Vol.44 No.6, pp639~652, 2012.
- Thermo-mechanical coupling analysis for DECOVALEX-2011 Task B, A“ spo“ pillar stability, GEOSYSTEM ENGINEERING, Vol.15 No.2, pp90~101, 2012.
- Swelling pressures of compacted Ca-bentonite, ENGINEERING GEOLOGY, Vol.129, pp20~26, 2012.
- EFFECTS OF VARIABLE SATURATION ON THE THERMAL ANALYSIS OF THE ENGINEERED BARRIER SYSTEM FOR A NUCLEAR WASTE REPOSITORY, NUCLEAR TECHNOLOGY, Vol.177 No.2, pp245~256, 2012.
- AN ANALYSIS OF THE FACTORS AFFECTING THE HYDRAULIC CONDUCTIVITY AND SWELLING PRESSURE OF KYUNGJU CA-BENTONITE FOR USE AS A CLAY-BASED SEALING MATERIAL FOR A HIGH-LEVEL WASTE REPOSITORY, Nuclear Engineering and Technology, Vol.44 No.1, pp89~102, 2012.
- An empirical model for the thermal conductivity of compacted bentonite and a bentonite-sand mixture, HEAT AND MASS TRANSFER, Vol.47 No.11, pp1385~1393, 2011.
- An Estimation of the Excavation Damaged Zone at the KAERI Underground Research Tunnel, TUNNEL AND UNDERGROUND SPACE, Vol.21 No.5, pp359~369, 2011.
- PROPERTIES OF LOW-PH CEMENT GROUT AS A SEALING MATERIAL FOR THE GEOLOGICAL DISPOSAL OF RADIOACTIVE WASTE, Nuclear Engineering and Technology, Vol.43 No.5, pp459~468, 2011.
- Thermal-hydro-mechanical Properties of Reference Bentonite Buffer for a Korean HLW Repository, TUNNEL AND UNDERGROUND SPACE, Vol.21 No.4, pp264~273, 2011.
- Geological Storage of High Level Nuclear Waste, KSCE JOURNAL OF CIVIL ENGINEERING, Vol.15 No.4, pp721~737, 2011.
- Suction and water uptake in unsaturated compacted bentonite, ANNALS OF NUCLEAR ENERGY, Vol.38 No.2-3, pp520~526, 2011.

- Initial thermal conditions around an underground research tunnel at shallow depth, INTERNATIONAL JOURNAL OF ROCK MECHANICS AND MINING SCIENCES, Vol.48 No.1, pp86~94, 2011.
- Estimation of the thermal properties for partially saturated granite, ENGINEERING GEOLOGY, Vol.115, pp132~138, 2010.
- Analysis of coupled thermo-hydro-mechanical process in the engineered barrier system of a high-level waste repository, NUCLEAR ENGINEERING AND DESIGN, pp, 2010.
- A correlation to predict the thermal conductivity of buffer and backfill material for a high-level waste repository, TUNNEL AND UNDERGROUND SPACE, , pp, 2010.
- Investigation of excavation damaged zone at KAERI underground research tunnel, TUNNELLING AND UNDERGROUND SPACE TECHNOLOGY, Vol.24, pp1~13, 2009.

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* Educational Background:

- Ph.D.: Petroleum Engineering / University of Alberta / Canada

- M.S.: Applied Geology/Seoul National University/ Korea

* Research Area: Reservoir Characteristics, Production data analysis, Recovery enhancement technology, Unconventional energy resources (Oil sands, shale gas)

* Academic Works:

- Development and application of proxy models for predicting the shale barrier size using reservoir parameters and SAGD production data, Journal of Petroleum Science and Engineering, Vol.170, pp.331~344, 2018.
- Lithofacies modeling by multipoint statistics and economic evaluation by NPV volume for the early Cretaceous Wabiskaw Member in Athabasca oilsands area, Canada, Geoscience Frontiers, Vol.9, No.2, pp.441-451, 2018
- The Stability Assessment of an Aquifer in Pohang Yeongil Bay due to CO₂ injection, The Journal of Engineering Geology, Vol.28, No.2, pp.183-192, 2018
- Efficient Prediction of SAGD Productions Using Static Factor Clustering, Journal

- of Energy Resources Technology, Vol.137, pp.137-143, 2015
- Uncertainty quantification of channelized reservoir using Ensemble Smoother with selective measurement data, Energy Exploration & Exploitation, Vol.32, No.5, pp.805-816, 2014
 - Status and Future of Unconventional Resources Development Technology, Petroleum Review, Vol.29, pp134~164, 2013.
 - Optimal Grid System Design for the SAGD Process Simulation, Journal of the Korean Society of Mineral and Energy Resources Engineers, Vol.50 No.5, pp667~677, 2013.
 - A simple parameter to optimize SAGD operating conditions, GEOSYSTEM ENGINEERING, Vol.15 No.2, pp85~89, 2012.
 - An Economic Indicator for Oil sands SAGD Project, Petroleum Review, Vol.27, pp176~190, 2011.
 - Well path optimization for preventing buckling in coiled tubing drilling, Journal of the Korean Society for Geosystem Engineering, Vol.46, No.2, pp. 160-170, 2009
 - Review of reservoir parameters to optimize SAGD and Fast-SAGD operating conditions, Journal of Canadian Petroleum Technology, Vol.46, No.1, pp. 35-41, January 2007
 - Fast-SAGD Application in the Alberta Oil Sands Areas, Journal of Canadian Petroleum Technology, Vol.45, No.9, pp. 46-53, September 2006
 - In-situ Recovery Methods for Oil sands Development and its economics, Petroleum Review (KNOC), Vol.23, No.1, pp. 99-122, Korea, June 2007
 - Dynamic Economic indicator To Evaluate SAGD Performance, JPT, Vol.58, No.12, pp.64-67, December 2006

4. Lee, Yong Gil (이용길)

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* Educational Background:

- Ph.D.: Economics of Innovation / Seoul National University / Korea

- M.S.: Mechanical Engineering / Seoul National University / Korea

* Research Area: Economics of Energy and Innovation, Management of Energy

Innovation, Intellectual Property Rights, Technology and Innovation
Policy

* Academic Works:

- Co-development strategy of gas and electricity in developing countries, Geosystem Engineering, 2018.
- Financial feasibility and social acceptance for reducing nuclear power plants: A contingent valuation study, Sustainability, Vol.10, No.11, 3833, 2018.
- Learning Curve, Change in Industrial Environment, and Dynamics of Production Activities in Unconventional Energy Resources, Sustainability, Vol.10, No.9, 3322, 2018.
- Analyzing the Learning Path of US Shale Players by Using the Learning Curve Method, Sustainability, Vol.9, No.12, 2232, 2017.
- An Analysis of Decision Factors on the Price of South Korea's Certified Emission Reductions in Use of Vector Error Correction Model, Sustainability, Vol.9, No.10, 1768, 2017.
- Productivity decomposition and economies of scale of Korean fossil-fuel power generation companies: 2001-2012, Energy, Vol.100, pp.1-9, 2016.
- What do customers want from improved residential electricity services? Evidence from a choice experiment", Energy Policy, Vol.85 (October), 2015.
- Enhancing public acceptance of renewable heat obligation policies in South Korea: Consumer preferences and policy implications", Energy Economics, Vol.51 (September), 2015.
- 성경과 기독교 신학 관점에서 조망해 본 에너지 자원, 로고스경영연구, Vol.12 No.1, pp15~34, 2014.
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- Multidisciplinary Team Research as an Innovation Engine in Knowledge-Based Transition Economies and Implication for Asian Countries: From the Perspective of the Science of Team Science, Journal of Contemporary Eastern Asia, Vol.12 No.1, pp49~63, 2013.
- A Study on the mobility limitation of technical personnel in Korea - focusing on problems in unidirectional mobility, 한국혁신학회, Vol.7 No.2, pp51~74, 2012.
- Strengthening competency linkage to innovation at Korean universities, SCIENTOMETRICS, Vol.90 No.1, pp219~230, 2012.
- Perspectives on technology transfer strategies of Korean companies in point of resource and capability based view, JOURNAL OF TECHNOLOGY MANAGEMENT

AND INNOVATION, Vol.6 No.1, pp161~184, 2011.

5. Pyun, Suk Joon(편석준)

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* Educational Background:

- Ph.D.: Computational Science and Technology/ Seoul National University/Korea

- M.S.: Geophysical Prospecting/Seoul National University/Korea

* Research Area: Seismic imaging & inversion (Full Waveform Inversion, OBS data migration, multiple suppression and imaging),

Reservoir characterization (Acoustic Impedance inversion, AVO inversion)

Microseismic monitoring (microseismic location, source characterization)

Computational geophysics (parallel computation, machine learning)

Various exploration technologies to investigate the Earth's interior
(seismic, gravity, magnetic, electrical and electromagnetic exploration, etc.)

* Academic Works:

- A simple inversion algorithm to estimate a linearly increasing velocity model for microseismic monitoring, EXPLORATION GEOPHYSICS, Vol.49 No.5, pp647~654, 2018.

- Broadband Seismic Exploration Technologies via Ghost Removal, Geophysics and Geophysical Exploration, Vol.21 No.3, pp183~197, 2018.

- Improvement of Migration Image for Ocean-bottom Seismic Data using Wavefield Separation and Mirror Imaging, Geophysics and Geophysical Exploration, Vol.21 No.2, pp112~124, 2018.

- Refraction traveltimes tomography based on damped wave equation for irregular topographic model, JOURNAL OF APPLIED GEOPHYSICS, Vol.150, pp160~171, 2018.

- Reverse-time Migration using Surface-related Multiples, Geophysics and Geophysical Exploration, Vol.21 No.1, pp41~53, 2018.

- Stretch-free Normal Moveout Correction, Geophysics and Geophysical Exploration, Vol.20 No.4, pp232~240, 2017.

- An efficient waveform inversion using the common mid-point gather in the wavenumber-space-time domain, EXPLORATION GEOPHYSICS, Vol.48 No.3,

pp219~225, 2017.

- Analysis on the Reliability and Influence Factors of Refraction Traveltime Tomography Depending on Source-receiver Configuration, Geophysics and Geophysical Exploration, Vol.20 No.3, pp163~175, 2017.
- An efficient 3D travelttime calculation using coarse-grid mesh for shallow-depth source, JOURNAL OF APPLIED GEOPHYSICS, Vol.133, pp25~29, 2016.
- A Study on Consistency of Numerical Solutions for Wave Equation, Geophysics and Geophysical Exploration, Vol.19 No.3, pp136~144, 2016.
- Improvement of Reverse-time Migration using Homogenization of Acoustic Impedance, Geophysics and Geophysical Exploration, Vol.19 No.2, pp76~83, 2016.
- Source wavelet estimation using common mid-point gathers, GEOSYSTEM ENGINEERING, Vol.18 No.4, pp199~204, 2015.
- Implementation of adaptive edge-preserving smoothing regularization technique for simultaneous multi-frequency full waveform inversion, EXPLORATION GEOPHYSICS, Vol.46 No.2, pp178~183, 2015.
- An efficient wavenumber-space-time domain finite-difference modeling of acoustic wave equation for synthesizing CMP gathers, GEOSYSTEM ENGINEERING, Vol.17 No.5, pp287~293, 2014
- An algorithm adapting encoded simultaneous-source full-waveform inversion to marine-streamer acquisition data, GEOPHYSICS, Vol.79, ppR183~R193, 2014.
- Laplace-domain wave-equation modeling and full waveform inversion in 3D isotropic elastic media, JOURNAL OF APPLIED GEOPHYSICS, Vol.105, pp120~132, 2014.
- Application of Effective Regularization to Gradient-based Seismic Full Waveform Inversion using Selective Smoothing Coefficients, Geophysics and Geophysical Exploration, Vol.16 No.4, pp211~216, 2013.
- A numerical study of simultaneous-source full waveform inversion with $l(1)$ -norm, GEOPHYSICAL JOURNAL INTERNATIONAL, Vol.194 No.3, pp1727~1737, 2013.
- A Study on Optimization of the Global-Correlation-Based Objective Function for the Simultaneous-Source Full Waveform Inversion with Streamer-Type Data, Geophysics and Geophysical Exploration, Vol.15 No.3, pp129~135, 2012.
- Laplace-domain waveform inversion versus refraction-traveltime tomography, GEOPHYSICAL JOURNAL INTERNATIONAL, Vol.190 No.1, pp595~606, 2012.
- Implementation of elastic reverse-time migration using wavefield separation in the frequency domain, GEOPHYSICAL JOURNAL INTERNATIONAL, Vol.189 No.3, pp1611~1625, 2012.

- Frequency-domain acoustic-elastic coupled waveform inversion using the Gauss-Newton conjugate gradient method, GEOPHYSICAL PROSPECTING, Vol.60 No.3, pp413~432, 2012.
- Frequency-domain Waveform Inversion using Residual-selection Strategy, Geophysics and Geophysical Exploration, Vol.14 No.3, pp214~219, 2011.
- Application of Displacement-Vector Objective Function for Frequency-domain Elastic Full Waveform Inversion, Geophysics and Geophysical Exploration , Vol.14 No.3, pp220~226, 2011.
- Equivalent source distribution for efficient 3-D acoustic wave equation modelling in the Laplace domain, GEOPHYSICAL JOURNAL INTERNATIONAL, Vol.186, pp740~750, 2011.
- IMPLEMENTATION OF THE GAUSS-NEWTON METHOD FOR FREQUENCY-DOMAIN FULL WAVEFORM INVERSION USING A LOGARITHMIC OBJECTIVE FUNCTION, JOURNAL OF SEISMIC EXPLORATION, Vol.20 No.2, pp193~206, 2011.
- 3D acoustic waveform inversion in the Laplace domain using an iterative solver, GEOPHYSICAL PROSPECTING, Vol.59 No.3, pp386~399, 2011.
- Robust Full Waveform Inversion Using Normalized Residual in the Frequency Domain, GEOSYSTEM ENGINEERING, Vol.14 No.1, pp9~14, 2011.
- 2D Elastic Waveform Inversion in the Laplace Domain, BULLETIN OF THE SEISMOLOGICAL SOCIETY OF AMERICA, Vol.100 No.6, pp3239~3249, 2010.
- Acoustic full waveform inversion of synthetic land and marine data in the Laplace domain, GEOPHYSICAL PROSPECTING, Vol.58 No.6, pp1033~1047, 2010.
- Frequency-domain waveform inversion using an l1-norm objective function, EXPLORATION GEOPHYSICS, Vol.40 No.2, pp227~232, 2009.
- Evaluation of Kirchhoff hyperbola in terms of partial derivative wavefield and virtual source, JOURNAL OF APPLIED GEOPHYSICS, Vol.65 No.1, pp50~55, 2008.
- Comparison of waveform inversion, part 1: Conventional wavefield vs logarithmic wavefield, GEOPHYSICAL PROSPECTING, Vol.55, pp449~464, 2007.
- Comparison of waveform inversion, part 2: phase approach, GEOPHYSICAL PROSPECTING, Vol.55, pp465~475, 2007.
- Comparison of waveform inversion, part 3: amplitude approach, GEOPHYSICAL PROSPECTING, Vol.55, pp477~485, 2007.
- Theoretical proof of the plane-wave decomposition for a complex seismogram, JOURNAL OF SEISMIC EXPLORATION, Vol.15 No.3, pp241~244, 2006.
- Wavepath tomography using a monochromatic frequency-domain wave equation, JOURNAL OF SEISMIC EXPLORATION, Vol.15 No.1, pp59~79, 2006.

- Efficient electric resistivity inversion using adjoint state of mixed finite-element method for Poisson's equation, JOURNAL OF COMPUTATIONAL PHYSICS, Vol.214 No.1, pp171~186, 2006.
- Two efficient steepest-descent algorithms for source signature-free waveform inversion: Synthetic examples, JOURNAL OF SEISMIC EXPLORATION, Vol.14 No.4, pp335~348, 2006.
- Refraction traveltimes tomography using damped monochromatic wavefield, GEOPHYSICS, Vol.70 No.2, ppU1~U7, 2005

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* Educational Background

- Ph.D.: Economic Geology, Geochemistry, Petrology / ETH Zurich / Switzerland
- M.S.: Geochemistry, Economic Geology / Seoul National University / Korea

* Research Area: Geology of ore deposits, Hydrothermal geochemistry, Seafloor hydrothermal ore deposits, Igneous petrology, Volcanic processes, Stable isotope geochemistry, Geochemical exploration

* Academic Works

- Zoned base metal mineralization in a porphyry system: origin and evolution of mineralizing fluids in the Morococha Distract, Peru, ECONOMIC GEOLOGY, Vol. 110, pp39~71, 2015.
- Hydrothermal sulfur geochemistry on molybdenite deposition of the Questa Mo-deposit, New Mexico, USA, GEOSCIENCES JOURNAL, Vol. 18, pp419~425, 2014.
- Selective copper diffusion into quartz-hosted vapor inclusions: Evidence from other host minerals, driving forces, and consequences for Cu-Au ore formation, GEOCHIMICA ET COSMOCHIMICA ACTA, Vol.113, pp60~69, 2013.
- Separation of Molybdenum and Copper in Porphyry Deposits: The Roles of Sulfur, Redox, and pH in Ore Mineral Deposition at Bingham Canyon, ECONOMIC GEOLOGY, Vol.107 No.2, pp333~356, 2012.
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- The relation between Cu/Au ratio and formation depth of porphyry-style Cu-Au +/- Mo deposits, MINERALIUM DEPOSITA, Vol.45 No.1, pp11~21, 2010.
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- Noble gas and stable isotope geochemistry of thermal fluids from Deception Island, Antarctica, ANTARCTIC SCIENCE, Vol.21, pp255~267, 2009.
- Determination of sulfur in fluid inclusions by laser ablation ICP-MS, JOURNAL OF ANALYTICAL ATOMIC SPECTROMETRY, Vol.23 No.12, pp1581~1589, 2008.
- Quantum chemical calculations of equilibrium copper(I) isotope fractionations in ore-forming fluids, CHEMICAL GEOLOGY, Vol.243, pp225~237, 2007.

4. Course List

Major	Course Code	Course	Credit	Taught in English
Energy Resources Engineering	ENR6011	Advanced Reservoir Engineering	3	(flexible)
	ENR6012	Advanced Oil Property Evaluation	3	(flexible)
	ENR6009	Computational Fluid Dynamics	3	(flexible)
	ENR6010	Natural Ventilation for Underground Space	3	(flexible)

	ENR6015	Rock Mechanics in Mining	3	(flexible)
	ENR6014	Mine development system	3	(flexible)
	ENR6013	In situ rock mechanics	3	(flexible)
	ENR6004	Petroleum Drilling Engineering	3	(flexible)
	ENR6003	Petroleum Reservoir Simulation	3	(flexible)
	ENR6006	Advanced Resource Management	3	(flexible)
	ENR6005	Advanced Resource Economics	3	(flexible)
	ENR6001	Advanced Geophysical Exploration	3	(flexible)
	ENR6002	Advanced Seismic Data Processing	3	(flexible)
	ENR6007	Hydrothermal Ore Deposit	3	(flexible)
	ENR6008	Advanced Geochemistry	3	(flexible)
	ENR7010	Advanced Well Logging	3	(flexible)
	ENR7011	Well Testing	3	(flexible)
	ENR7008	Ventilation Design and Simulation	3	(flexible)
	ENR7009	Surface Mining and Slope Stability	3	(flexible)
	ENR7013	Advanced Rock Mechanics	3	(flexible)
	ENR7012	Engineering for Underground Space	3	(flexible)
	ENR7004	Unconventional Petroleum Development	3	(flexible)
	ENR7003	Enhanced Oil Recovery	3	(flexible)
	ENR7005	Management of Energy Innovation	3	(flexible)
	ENR7006	Advanced Energy and Resource policy	3	(flexible)
	ENR7001	Numerical Modeling in Geophysics	3	(flexible)

	ENR7002	Advanced Geophysical Inverse Problems	3	(flexible)
	ENR7007	Advanced Economic Geology	3	(flexible)
	ENR7015	Advanced seismic imaging technology	3	(flexible)
	ENR7014	Analytical Geochemistry	3	(flexible)
		Mine Reclamation Technology		

5. Others

1) Resources Environment & Ventilation Laboratory: Kim, Jin (김진)

* Homepage: <http://blog.naver.com/jsks8228>

* Lab address: 2E354, Department of Energy Resources Engineering, Inha University, 100 Inharo, Nam-gu, Incheon, 402-751, Korea

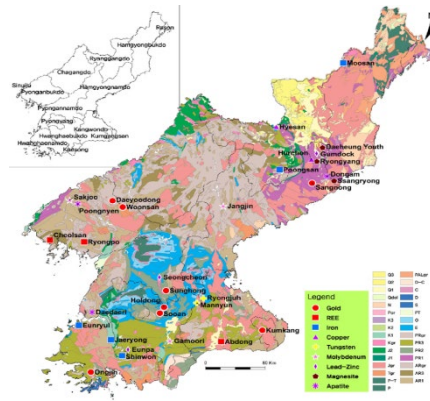
* Tel: + 82-32-872-7551

* Laboratory Purpose

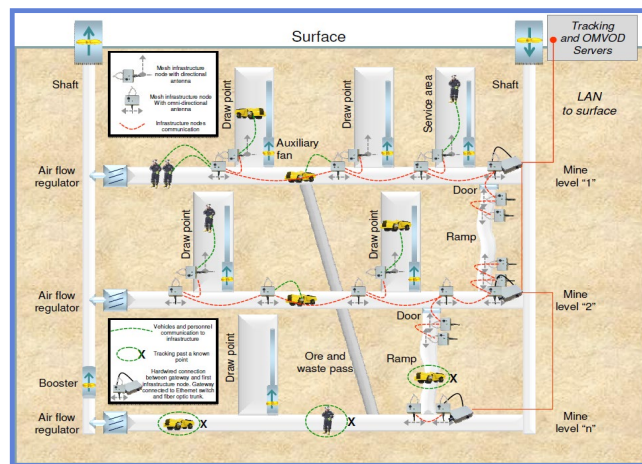
Our laboratory research is focused on the Environment Impact Assessment (EIA), HSE (Health, Safety, Environment), ventilation system, and reclamation for energy resources. Lately our most interested topics are study on development of north korea mineral resources and design of ventilation system using wireless monitoring system in underground mines. We carry out environment and ventilation related research projects using numerical analysis and scaled model test. The laboratory has a series of wind tunnel and instrumentation for measuring airflow and air quality.

* Recent research

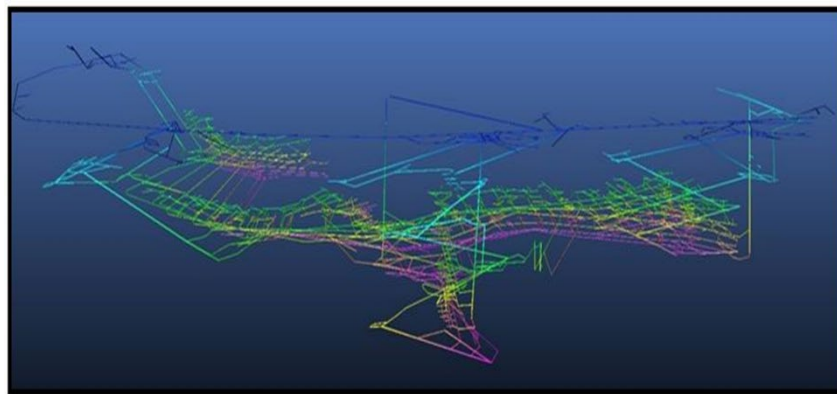
- A study on development of north korea mineral resources.



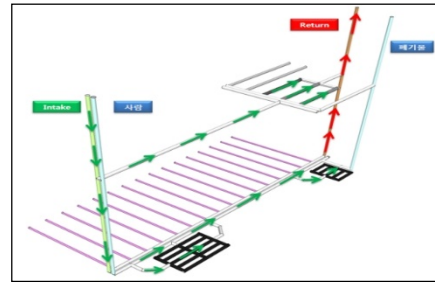
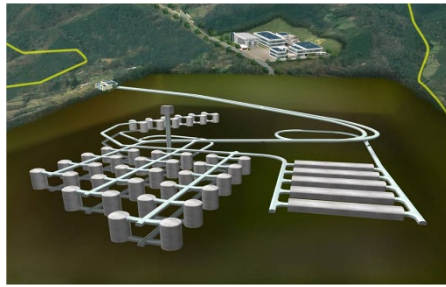
– Design of environmental monitoring system in underground mines using wireless sensor network.



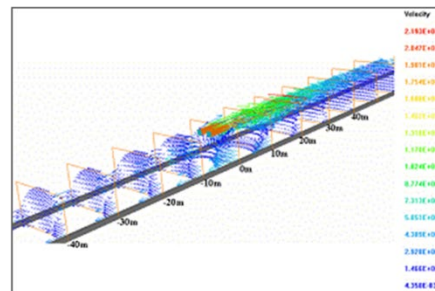
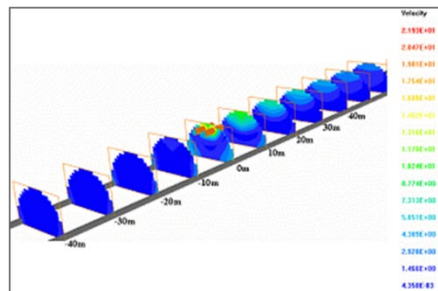
– Design and ventilation network simulation for the underground mines.



– Environmental design of the radioactive waste disposal repository.



– Design of road tunnel and subway.



2) Rock Mechanics Laboratory: Kwon, Sang-ki (권상기)

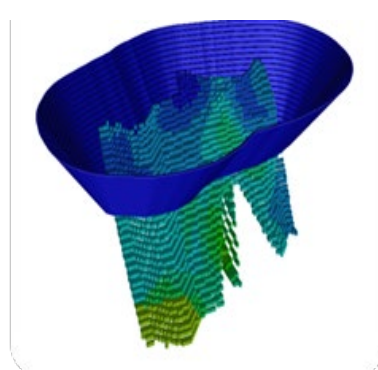
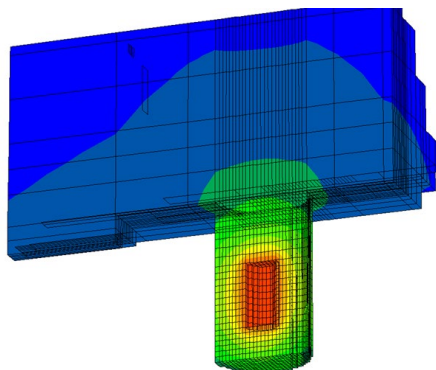
* Homepage: <http://rock.inha.ac.kr/>

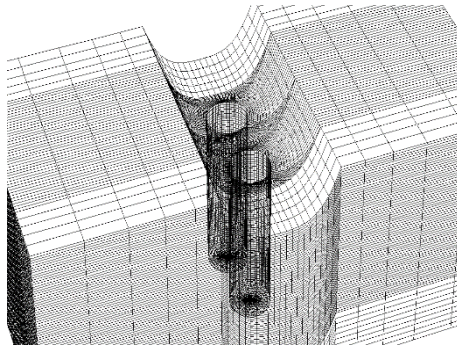
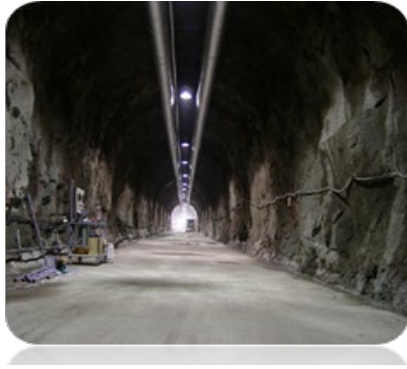
* Lab address: 서-009, Department of Energy Resources Engineering, Inha University, 100 Inharo, Nam-gu, Incheon, 402-751, Korea

* Tel: + 82-32-860-7554

* Recent research

- THM coupling behavior in deep underground rock
- Rock property changes under saturated condition
- Tunnel stability analysis with a consideration of EDZ
- Three-dimensional mine design
- Pillar stability analysis under thermo-mechanical loading condition





3) Unconventional Resources Energy Laboratory: Shin, Hyun-don (신현돈)

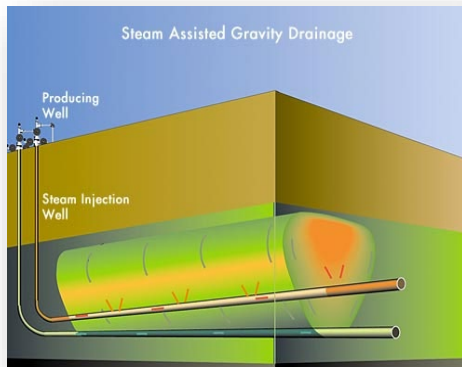
* Homepage: <http://petro.inha.ac.kr/>

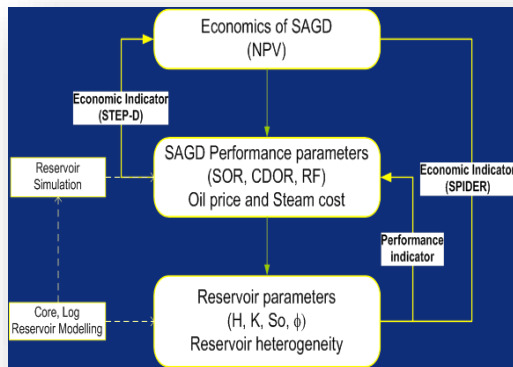
* Lab address: 4-409, Department of Energy Resources Engineering, Inha University, 100 Inharo, Nam-gu, Incheon, 402-751, Korea

* Tel: + 82-32-860-7553

* Recent research

- Optimize the SAGD Process
- Impact of Shale barrier in the SAGD Process
- Reservoir Economic Indicator
- In-Situ Combustion, Solvent Injection



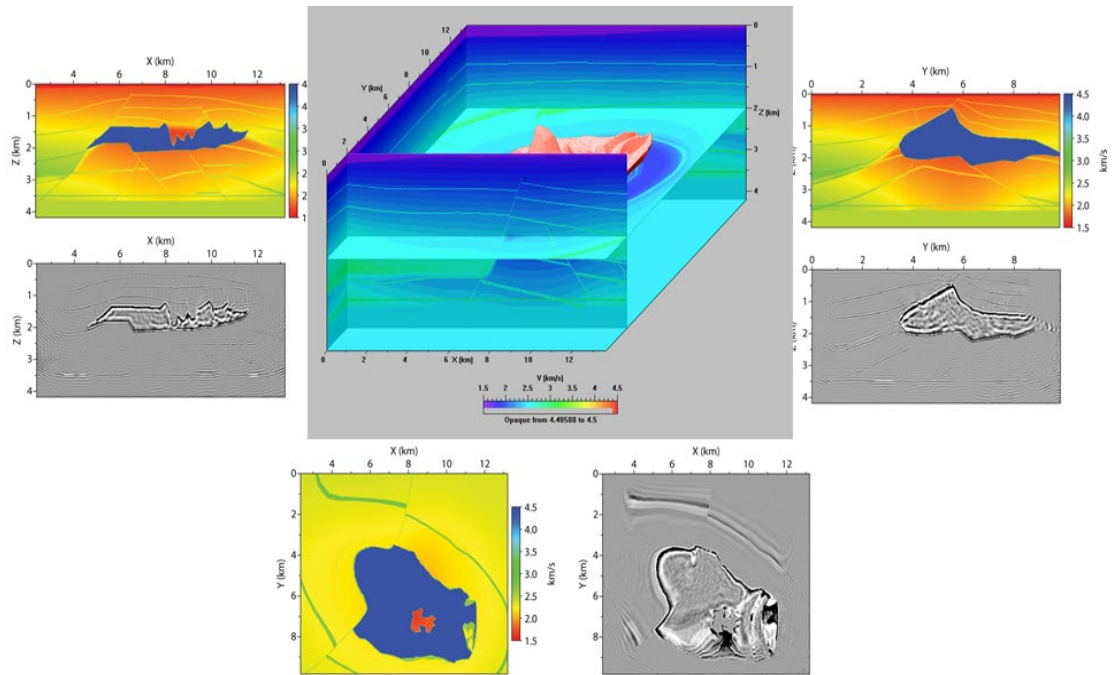


4) Resource Economics Laboratory: Lee, Yong-Gil (이용길)

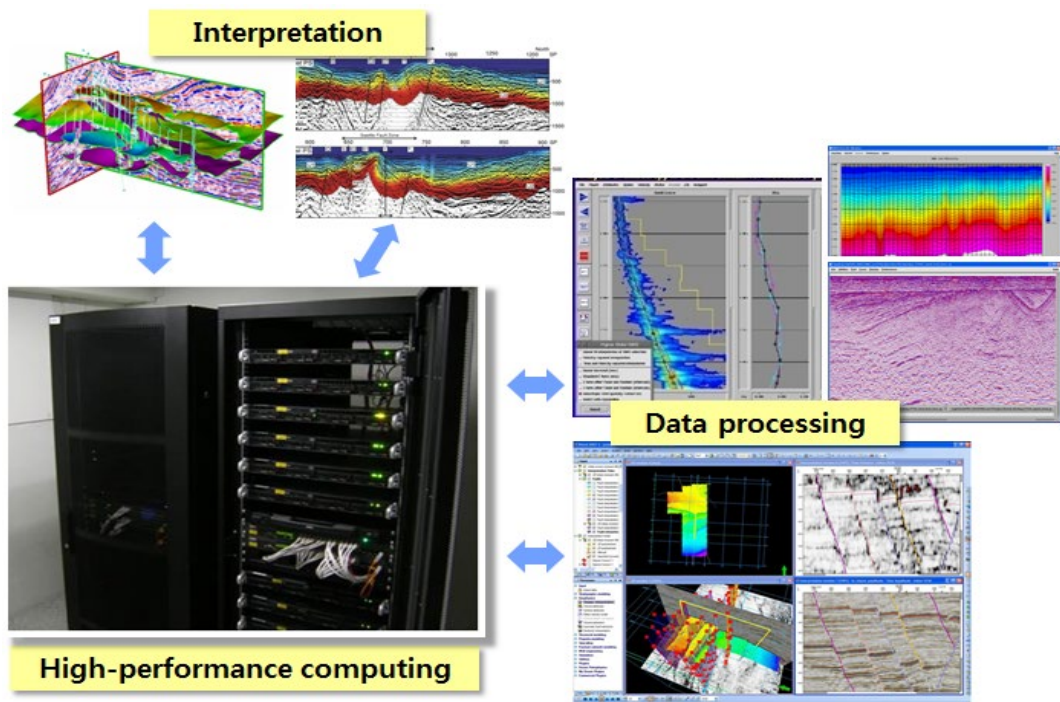
- * Homepage:
- * Lab address: 2N698, Department of Energy Resources Engineering, Inha University, 100 Inharo, Nam-gu, Incheon, 402-751, Korea
- * Tel: + 82-32-860-7555
- * Recent research
 - Industrial ecology through network analysis
 - Estimation of willingness to pay for renewable energy system
 - Learning curve of energy systems
 - Economic evaluation of energy resources

5) Geophysical Prospecting Laboratory: Pyun, Suk-Joon (편석준)

- * Homepage: <http://gpl.inha.ac.kr>
- * Lab address: 2N698, Department of Energy Resources Engineering, Inha University, 100 Inharo, Nam-gu, Incheon, 402-751, Korea
- * Tel: + 82-32-873-7552
- * Recent research
 - Seismic Full Waveform Inversion & Reverse-time migration



- Full wavefield based AVO inversion
- Parallel computation of geophysical inverse problems



6) Resource Geology Laboratory: Seo, Jung-Hun (서정훈)

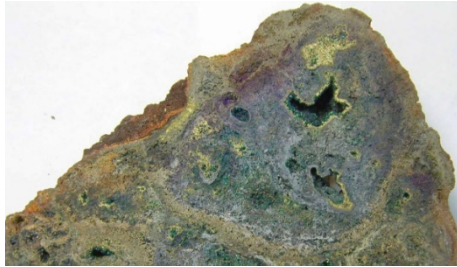
* Homepage:

* Lab address: 서-008, Department of Energy Resources Engineering, Inha University, 100 Inharo, Nam-gu, Incheon, 402-751, Korea

* Tel: + 82-32-863-4877

* Recent research

- Geochemistry of Sub-Seafloor Hydrothermal Ore Deposit Formed in Antarctic Mid-Ocean Ridge (MOR)



- Geology and Geochemistry of Porphyry Cu-Mo-Au and Skarn Polymetallic Deposits



- Volatile (Halogen and Sulfur) Geochemistry in Volcanic System

