

EARTH OBSERVATION SYMPOSIUM (B1)
Earth Observation Applications and Economic Benefits (5)

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MINERAL EXPLORATION ON MOUNTAINOUS AREA IN KOREA USING HYPERSPECTRAL
IMAGERY**Abstract**

Minerals are crucial materials for human life and recently their values and market prices are rising continuously. According to the tendency of price rising, reinvestigation and redevelopment for abandoned or inactive mining areas have been activated in Korea. Mineral exploration usually starts with regional investigation and this step is labor and time intensive. Remote sensing can improve the efficiency and accuracy of the regional investigation using computerized data processing. Bird view and two dimensional analysis of imagery can overcome spatial limits of manual soil and rock sampling.

Minerals absorb entering electromagnetic energy in particular wavelengths due to electronic process and vibrational process of constituents and elements so this process produces intrinsic diagnostic spectral reflectance curves. Hyperspectral imagery consists contiguous narrow bands more than two hundreds including visible to shortwave infrared wavelength so minerals can be detected and discriminated by extracting their diagnostic absorption features and it also can support and alternate in situ tests or laboratory experiments.

In this study we conducted mineral exploration on mountainous area in Korea using hyperspectral imagery. We used EO-1 Hyperion data of which spatial resolution is 30m and rocks and minerals specimens including clay minerals obtained in fields to use as standard materials of investigation. About 70 percents of Korean territory is mountainous area and covered with vegetations. So bare soil exposed on ground occupies relatively small part of the imagery. Various sub-pixel analysis methods were adopted for mineral exploration and the results were compared with detailed geological investigation reports. Finally, we suggested optimized sub-pixel analysis methods suitable for mountainous and vegetation covered areas and produced mineral distribution maps.