

INTEGRATION OF REMOTE SENSING AND GEOPHYSICS FOR GEOSTRUCTURAL ANALYSIS OF THE TAM DUONG KARST AREA, VIETNAM

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In geological remote sensing the two application fields which benefit most from information extracted from satellite imagery are lithological and structural mapping. Information from surface mapping is commonly used to postulate the distribution of geological features in the subsurface. Surface geological features may be traceable in bedrock outcroppings (ground surveys), from air photographs (photogeological reconnaissance) and/or from satellite images. In the subsurface, geological features may be perceptible from boreholes, cuttings and/or surface geophysics methods. Geophysics is a scientific discipline involving the measurement of parameters that are diagnostic of the physical properties of the materials at and beneath the earth's surface. Ideally the measured quantities give the user, by way of the physical properties for which the geophysical data are diagnostic, some meaningful understanding of the structure, composition and processes occurring within

the earth. This leads to the idea that geophysical data should be integrated with remotely sensed data because the two sources can complement each other. Remotely sensed data can detail features on the earth, while geophysical data can describe these features in the subsurface. In this paper, remotely sensed data (Landsat ETM) and geophysical data (aeromagnetic and gravity) are integrated to establish a geological map, and detail the structural conditions of the Tam Duong area in NW Vietnam. Different techniques are applied for both kinds of data: image transformation, lineament analysis, qualitative interpretation of gravity and magnetic anomalies, interactive analysis and model fitting of geophysical cross-section. The integration of remote sensing and geophysics shows promising in increasing the knowledge of the geological structure of the mountainous karst area of Tam Duong, NW Vietnam. This integration will be the key for further hydrological, cave development, and mining studies.