

## TOPOGRAPHIC ENHANCEMENTS AND SUPPRESSIONS IN REMOTE SENSING INVESTIGATIONS \*

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### SUMMARY

Topographic expression can enhance or hinder the interpretation of remote sensing imagery. Here we provide an overview of the logical basis under which user control of topographic expression should proceed and the methods by which such control maybe implemented.

Suppression of topographic expression is necessary when the image data are to be used as relative measures of spatial variation in ground reflectance properties. Spectral band ratios are commonly used in mineral exploration, but are effective as a method of topographic suppression only when accurate atmospheric corrections are applied. Here we show a variety of practical methods for determining atmospheric corrections and demonstrate how ancillary topographic data can be used to provide spatially variable atmospheric corrections so that ratio processing can be successfully applied in exploration efforts in regions of very high relief.

Enhancement of topographic expression is beneficial in revealing structural features and clarifying their spatial relationships, It is also highly beneficial in logistical planning. Topographic expression in images can be augmented by modulating image intensity with shaded relief derived from a co-registered DEM. However, this works best when the DEM has a spatial resolution higher than that of the imagery. This will be increasingly uncommon as new high resolution spaceborne sensors proliferate.

Alternatively and preferably, topographic expression can be enhanced by adding a new and independent perceptual dimension to the imagery. This is achieved by using a co-registered DEM to create a stereoscopic display. In this case, the DEM can actually be of a spatial resolution less than that of the imagery because the non-stereoscopic depth cues already in the imagery reinforce and sharpen the stereoscopic perception.

Research described in this report was carried out by the Jet Propulsion Laboratory, California Institute of Technology, Pasadena, California under contract with the National Aeronautics and Space Administration.

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\* Presented at the Twelfth International Conference and Workshops on Applied Geologic Remote Sensing, Denver, Colorado, 17-19 November 1997.