

Multiple Band Temperature Extraction Algorithm Implementation in ENVI

MULTIPLE BAND TEMPERATURE EXTRACTION ALGORITHM IMPLEMENTATION IN IDL AND ENVI. *N. Sinisgalli, D. Messinger*,*

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Direct inversion of radiance to temperature requires absolute knowledge of the atmosphere. By introducing additional bands into the temperature extraction method, the amount of atmospheric information necessary is greatly reduced. A two-band algorithm has been previously developed for determining ocean temperature from infrared images collected by airborne sensors. This algorithm requires radiance measurements from two bands, along with sufficient knowledge of the atmosphere at the time the measurements are taken. This algorithm was extended to include a third band, and tested on a larger data set, primarily terrestrial, with varying types of targets, to see if the addition of a third band can produce a more accurate estimation of temperature with less atmospheric knowledge. Thus far, this algorithm has been implemented in a program written in IDL, accompanied by a graphical user interface for ease of use. There are advantages to both methods, dependent on the specific wavelengths of the bands chosen for calculation. It is yet to be determined in which regions the algorithms are best suited for use; data has been generated with DIRSIG, a physics-based scene rendering program, and is currently being analyzed. Methods of analysis include two-dimensional plots, three-dimensional plots, and error images (as a function of wavelengths chosen), in which a brightness value is assigned according to the amount of error. A sensitivity analysis of the required input parameters will also be conducted.