

Imaging Spectroscopy in the United States

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Currently there is a substantial amount of research and applications work being performed in the United States (US) using Imaging Spectrometer data. At the forefront in the research domain, in both data analysis and sensor development is the Airborne Visible and Infrared Imaging Spectrometer (AVIRIS). AVIRIS is engineered, maintained, and operated by the Jet Propulsion Laboratory (JPL) under contract for the National Aeronautical and Space Administration (NASA). With 224 contiguous bands from 380 – 2400 nm with 10 nm sampling intervals and a high signal to noise ratio, the spectral data acquired by this sensor is unmatched by any sensor in the commercial sector. Flown on both NASA owned aircraft and commercially owned aircraft, the spatial resolution of AVIRIS is between 4 – 20 meters. The sensor has a large user base in the remote sensing research community that is constantly finding new uses for high fidelity spectral data. Fields of study using AVIRIS datasets include, and are not limited to, terrestrial ecology, snow hydrology, oceanography, soil science, geology, and satellite calibration and validation. A US commercial hyperspectral market is presently growing at this time. Several vendors exist that operate high quality sensors that collect spectral data for various applications. As the demand for commercial hyperspectral data has grown, so have the commercial sensors operators. Benefits of the commercial hyperspectral sensors are the availability and lower costs. The delivered data product is of higher value to the commercial data buyers since the data is processed for ease of use. Commercial data is delivered as a geometrically corrected surface reflectance data product that can be opened with most remote sensing software packages. Typically the commercial hyperspectral data providers pride themselves in rapid final product delivery times, sometimes within days of data acquisition. Commercial applications include, agriculture, environmental monitoring, forestry, urban studies, and energy/mineral/petroleum exploration to name a few. The spectral range, sampling interval, and signal to noise ratio varies with the different commercial hyperspectral sensors. However, the spatial resolution is usually less than 5 meters, and can often be acquired with sub-meter resolution. Presently there are 3 major providers of commercial hyperspectral data in the United States.