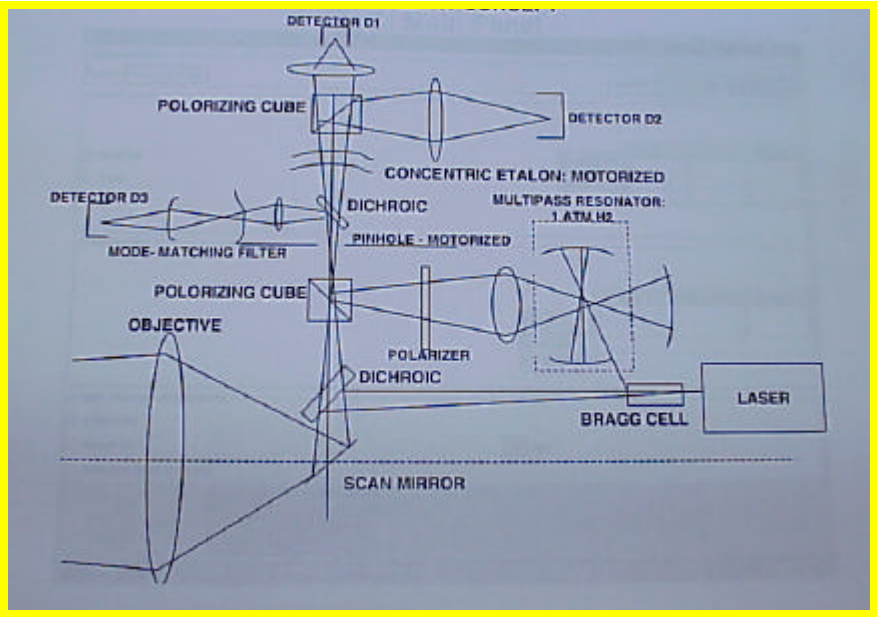
Hydrogen Imaging Leak Detection System



Objective

A self-contained unit which needs electrical power and cooling water, which can form real-time images of H_2 leaks in the vicinity of duct joints. This unit contains alignment systems and calibration monitoring systems. The principle of operation is Raman scattering of a laser beam, wherein the laser provides energy to a gas absorbing it, and the molecules then reradiate at a different wavelength peculiar to that molecule. The detection of that wavelength, relative to the incident laser beam, positively identifies the material present. The returned signal is quite weak, however, and many physical imaging enhancement techniques are employed.

Why Needed

Health monitoring of spacecraft during the fueling/pre-launch phase is required to assure that no fuel is leaking as it is being loaded. This is a safety item and has been known to ground craft. Such grounding is very expensive as it extends the time involved in launching.

Point of Contact

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Sponsor

Space Shuttle Program (SSP)