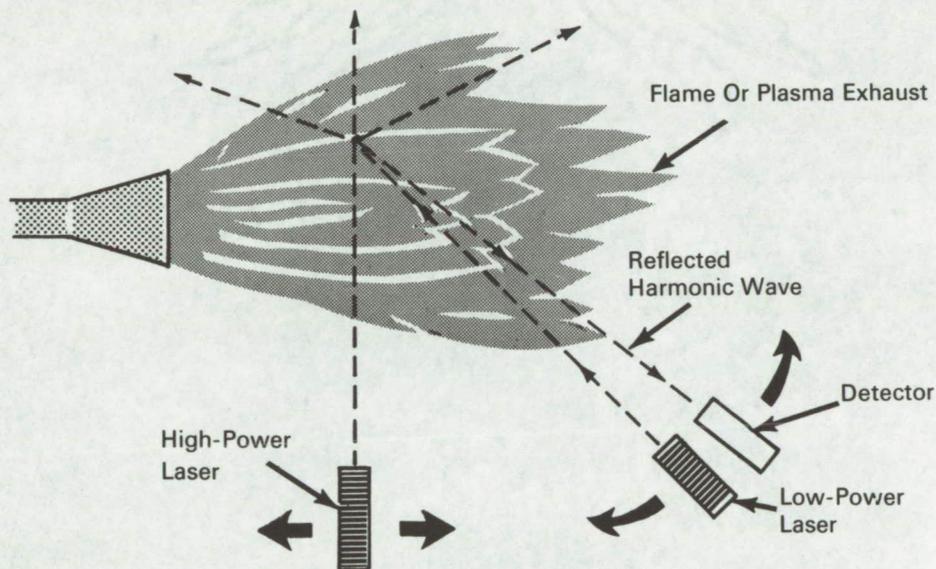


NASA TECH BRIEF



NASA Tech Briefs are issued to summarize specific innovations derived from the U.S. space program, to encourage their commercial application. Copies are available to the public at 15 cents each from the Clearinghouse for Federal Scientific and Technical Information, Springfield, Virginia 22151.

Concept for Using Laser Beams to Measure Electron Density In Plasmas



A concept is presented for using laser beams as a means of measuring electron density at various points in flame or plasma exhausts. This proposed laser application is based on the theoretical behavior of two plane waves propagating through a nonlinear medium, such as a plasma. Refraction of a low-power laser beam in a plasma would give rise to nonlinear polarized waves and a reflected harmonic wave from a point in the plasma. A measure of the electron density at this point would then be obtained by detecting the amplitude of the reflected harmonic wave. A second high-power laser beam would be used to create the abrupt dielectric change required in the plasma to provide a reflected wave of sufficient amplitude.

Note:

This development is in the conceptual stage only, and as of the date of publication of this Tech Brief neither a model nor a prototype has been constructed.

Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

Source: Salvador E. Longo
of The Boeing Company
under contract to
Marshall Space Flight Center
(M-FS-965)
Category 01