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Spectroscopic Diagnostics and an ARC Jet Heated Air Plasma (Paperback)

By Larry Howard Mack

Biblioscholar, United States, 2013. Paperback. Condition: New. Language: English . Brand New Book ***** Print on Demand *****.Spectral radiation measurements were made in the range of 200 to 900 nm across a section of the plenum of an arc jet wind tunnel using a series of optical fibers. The spectra contained line radiation from Oxygen and Nitrogen atoms and molecular radiation from $N_2(+)$, N_2 , and NO. Abel inversion technique is used to obtain radial distribution of the spectra. The analysis yielded radial profiles of the electronic excitation, vibrational and rotational temperatures of the flow field. Spectral fitting yielded branching ratios for different vibrational and rotational bands. Relatively mild flow conditions, i.e. enthalpy and mass flow rate, were used for prolonged measurements of up to and over two hours to establish the best experimental methods of temperature determinations. Signal to noise was improved by at least an order of magnitude enabling the molecular vibrational band heads of $N_2(+)$ (first negative system), N_2 (second positive system), and NO (beta, gamma, delta, and epsilon systems) to be resolved in the lower ultraviolet wavelength regions. The increased signal to noise ratio also enabled partial resolution of the rotational lines of $N_2(+)$ and N_2 in...



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