

**Abstract Submitted for the Twelfth Topical Conference
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Category Number and Subject:

☐ Theory ☒ Experiment

Partial Pressure Measurements with an Active Spectrometer,*

N.H. Brooks, R. Colchin,[†] D.K. Finkenthal,[‡] T.H. Jensen, R. Maingi,[†] N. Naumenkoi,^Δ S. Tugarinov,[◇] M.R. Wade,[†] *General Atomics* — Partial pressure neutral gas measurements have been made using a commercial Penning gauge or a high pressure ionization gauge in conjunction with an “active spectrometer.”[#] In prior work¹ utilizing bandpass filters and conventional spectrometers, trace concentrations of the hydrogen isotopes H, D, T and of the noble gases He, Ne and Ar were determined from characteristic spectral lines in the light emitted by the neutral species of these elements. For all the elements mentioned, the sensitivity was limited by spectral contamination from a pervasive background of molecular hydrogen radiation. The active spectrometer can be “masked” to detect spectral lines from a specific element and to discriminate against the quasi-continuous background due to molecular hydrogen and the blackbody continuum from the hot filament of the ionization gauge. Therefore, the sensitivity of partial pressure measurements can be increased significantly. Presently, the active spectrometer is limited in scan amplitude to a narrow spectral width appropriate for detecting atomic line features. With an increase in the spectrometer's scan amplitude, this optical technique may be extended to the measurement of partial pressures of molecules and radicals.

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[#]Patent pending.

¹C.C. Klepper, Rev. Sci. Instrum. **68**, 400 (1997).

☒ Prefer Poster Session

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