Abstract Submitted
for the OSF08 Meeting of
The American Physical Society

Pressure broadening and shifting of the Cesium D1 and D2 lines by rare gases DOUGLAS WERTEPNY, GREG PITZ, GLEN PERRAM, Air Force Institute of Technology — The Diode Pumped Alkali Laser (DPAL) offers a high power, electrically driven laser with excellent thermal management, lightweight packaging, and high brightness for tactical military applications. The concept of using a gas phase medium for the phasing of large diode arrays via a highly efficient, cyclical photon engine combines the best features of electrically driven lasers with the inherent thermal management advantages of a gas lasers. Matching the spectral bandwidth of the diode pump source with the atomic absorption profile is paramount and requires both the narrow banding of high power diode laser arrays and novel approaches to broadening the gas lineshape. In the present work, the rates for pressure broadening and line shifts are reported for both atomic and molecular collision partners using laser absorption and induced fluorescence techniques. The absolute absorption and stimulated emission cross-sections, including the effects of hyperfine splitting and pressure broadening at low to moderate pressures are computed and compared with experimental results.

Glen Perram
Air Force Institute of Technology

Date submitted: 30 Sep 2008 Electronic form version 1.4