



## Characteristics of a High Intensity, Pulsed, Potassium Vapor Laser in a Heat Pipe

By Edward J. Hurd

Biblioscholar Okt 2012, 2012. Taschenbuch. Book Condition: Neu. 246x189x4 mm. This item is printed on demand - Print on Demand Neuware - This thesis research paper presents the results of experiments using an optically pumped, pulsed potassium vapor laser in a heat pipe. The absorption on the potassium D2 line, output laser characteristics, and Raman scattering in potassium vapor are discussed. The spectral full width at half maximum (FWHM) of the D2 absorption line was much greater than predicted values for pressure broadening due to the high number density of potassium atoms and the long path length. At 320°C and 0 torr of helium, the FWHM was 765 GHz. At 100 torr it was 968 GHz. At 200 torr it was 1.12 THz. The analyzed potassium laser output characteristics include the temporal dynamics of the laser cavity, the instantaneous energy efficiencies, and the spin-orbit recycling rates. At 320°C with 2500 torr of helium, a potassium laser with 1.53 MW/cm peak intensity and 8.25% slope efficiency was demonstrated. At 320°C and 0 torr of helium, stimulated electronic Raman scattering occurred in the potassium heat pipe. First and second order Stokes and anti-Stokes lines were visible with energy differences identical to the...

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