

Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Microwave Spectroscopy in Helium Nanodroplets. RUDOLF LEHNIG, University of Alberta, WOLFGANG JAEGER, University of Alberta — We have implemented a microwave resonator, i.e. a Fabry-Perot cavity, into a helium nanodroplet instrument. The cavity consists of two spherical aluminum mirrors with radius of curvature of 13 cm and diameter of 10 cm. The cavity is mounted in a coaxial fashion into the instrument to maximize the interaction length between radiation and doped helium droplets. The helium droplet beam enters and exits the cavity through a hole in each of the mirrors. One of the mirrors can be adjusted to tune the cavity into resonance. The output of a cw microwave synthesizer can be amplified by a traveling wave tube amplifier to powers of about 25 Watt and is coupled into the cavity through a simple wire hook antenna. Detection is accomplished using the depletion technique. We have measured the spectrum of the J=2-1 transition of carbonylsulfide demonstrating the sensitivity of this method. Power saturation was observed and will be analyzed as will be the observed line width of the transition.

Wolfgang Jaeger
University of Alberta

Date submitted: 30 Nov 2005

Electronic form version 1.4