INTRACAVITY LASER INDUCED FLUORESCENCE RESOLVED BY FT SPECTROMETRY

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Resolved fluorescence spectra produced with intracavity excitation show that the combination of Fourier transform and intracavity FT/LIF techniques (ICLIF) holds great promise for observing weak electronic transitions.
We give here preliminary results on alkali dimers (K_2), illustrating the potentiality and the limitations of this combination for electronic spectroscopy. It is shown that interaction volumes between the molecular source and the laser beam (diameter 0.4 mm) are increased by a factor of 25 using a single mode Spectra Physics 380 ring cavity, rebuilt in our laboratory for the purpose. Two-photon processes are clearly enhanced in high resolution FT Spectra, and collisional features and transitions to rovibrational levels close to the ground state dissociation limit have been observed. ICLIF is adapted to the study of weakly absorbing systems. It allows access to *gerade* levels for species with a centre of inversion, which are not probed directly by one-photon absorption methods (including CRDS).