

## STUDY OF TWO-PHOTON RESEONANT FOUR WAVE SUM MIXING IN XEON AND ITS COMPETITION WITH THE FOUR WAVE DIFFERENCE MIXING

W. AL-BASHEER, Y. J. SHI, *Department of Chemistry, University of Calgary, Calgary, Alberta, T2N 1N4.*

The two-photon resonant four wave sum- and difference-mixing in Xe gaseous medium was studied by subjecting a variety of molecular samples, including acetone, furan, triethylamine (TEA), and dimethylsilacyclobutane (DMSCB), to the laser sources produced from the four wave mixing processes for ionization. Ionization of acetone-h<sub>6</sub>, acetone-d<sub>6</sub>, furan-h<sub>4</sub>, furan-h<sub>4</sub>, and DMSCB samples showed similar behaviour. It is demonstrated that in a vacuum ultraviolet (VUV) spectral region of 103 - 109 nm four-wave sum mixing in Xe can only occur in ten discontinued regions, all of which are to the blue of a Xe atomic transition. Study of the TEA sample with its ionization potential lower than the photon energy of the VUV radiation from the difference mixing illustrated the competition between the sum- and difference-mixing occurring simultaneously in the Xe gas cell.