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Characterization and calibration of a combined laser Raman, fluorescence and coherent Raman spectrometer CARLOS LAWHEAD, NATHAN COOPER, JOSIAH ANDERSON, TEGAN SHIVER, LASZLO UJJ, University of West Florida — Electronic and vibrational spectroscopy is extremely important tools used in material characterization; therefore a table-top laser spectrometer system was built in the spectroscopy lab at the UWF physics department. The system is based upon an injection seeded nanosecond Nd:YAG Laser. The second and the third harmonics of the fundamental 1064 nm radiation are used to generate Raman and fluorescence spectra measured with MS260i imaging spectrograph occupied with a CCD detector and cooled to -85 °C, in order to minimize the dark background noise. The wavelength calibration was performed with the emission spectra of standard gas-discharge lamps [1]. Spectral sensitivity calibration is needed before any spectra are recorded, because of the table-top nature of the instrument. A variety of intensity standards were investigated to find standards suitable for our table top setup that do not change the geometry of the system. High quality measurement of Raman standards where analyzed to test spectral corrections. Background fluorescence removal methods were used to improve Raman signal intensity reading on highly fluorescent molecules. This instrument will be used to measure vibrational and electronic spectra of biological molecules.

[1] Carrabba, M. "Wavenumber Standards for Raman Spectrometry" **Handbook of Vibrational Spectroscopy**. John Wiley & Ltd. 2002.

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