TUNABLE INFRARED SPECTROMETER BASED ON DIFFERENCE-FREQUENCY GENERATION IN $AgGaS_2$ FOR LINESHAPE STUDIES IN N_2O

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A high resolution (2 MHz) and high signal-to-noise ratio, cw, tunable, infrared spectrometer has been constructed. It is based on difference-frequency generation in a nonlinear crystal of $AgGaS_2$, by combining two tunable ring dye lasers. With present dyes (Sulfrhodamine 640 and Rhodamine 590) an output wavelength range of 7.77 - 9.10 microns is covered. With total input power of 600 mW, the output power exceeds 100 nW at the peak of the emission curve. This range of wavelength and power allows us to do line shape measurements in important atmospheric gases such as N_2O and CH_4.