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Observation of the $\widetilde{A} - \widetilde{X}$ Electronic Transition of the Jet-Cooled Methyl Peroxy Radical by High Resolution CRDS PATRICK DUPRÉ[1], The Ohio State University, Columbus, SHENGHAI WU, PATRICK RUPPER, TERRY MILLER, The Ohio State University — Reactive intermediates are of crucial importance both for combustion and atmospheric chemistry. By using our new home made Fourier Transform limited (10–30 MHz) Ti:Sa laser source we have probed the vibrationless level of the first electronic state (in the near-IR range) of both CH_3OO and CD_3OO radical species. The radicals are formed inside a $Ne/He/O_2/CH_3I$ plasma created by a DC or a RF electrical discharge. The supersonic jet expansion necessary for the rotational cooling ($\sim$ 20 K) is obtained by a pulsed slit nozzle ($\sim$ $50 \times 0.5\,mm^2$). The near-IR radiation, obtained by Stimulated Raman Scattering (SRS) is injected inside a high finesse cavity. A sensitivity of the order of $\sim 20 \times 10^{-9}$ /pass/$\sqrt{\text{Hz}}$ is currently obtained. Spectrum with a resolution $\sim$ 350 MHz for CD_3OO clearly shows rotational and spin-rotation structure with effects of the internal methyl group rotation possibly evolved.

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