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Time-Resolved Spectroscopy to investigate the radiative lifetimes of Na_2 $6^1\Sigma_g^+$ (8,31)[1] MICHAEL SAARANEN, DINESH WAGLE, BURCIN BAYRAM, Miami Univ — In recent years, there has been an increased interest in the determination of the lifetime values as a result of growing demand for accurate knowledge of the transition dipole matrix elements of alkali molecules. Here we present our experimental study of the lifetime of the $6^1\Sigma_g^+$ (8,31) electronic state of sodium dimers. In this experiment the second harmonic of a Nd:YAG laser is used to pump two pulsed dye lasers that are used to make the $X^1\Sigma_g^+$ (v=0,31) $\rightarrow$ $A^1\Sigma_u^+$ (7,30) $\rightarrow$ $6^1\Sigma_g^+$ (8,31) transition. We observed the fluorescence resulting from this molecular transition to measure its radiative properties using a Stern-Volmer plot. We will present results of the measurement, as well as improvements made to the measurements, and provide comparison with the recent theoretical calculations.

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Dinesh Wagle
Miami Univ

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