

Development of Time-resolved STM with Alternatively Switching Two Optical Paths

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Understanding and controlling carrier dynamics in nanoscale structures are the key for advancing nanoscale science and technology. Recently, we successfully combined a STM with a pulse laser system to visualize picosecond carrier dynamics in semiconductor devices with nanoscale spatial resolution. The conventional system, however, waste most of the laser pulses generated by laser oscillator in its delay time modulation mechanism. It causes decrease of signal intensity when ultrafast phenomena faster than 1 ns is measured. To solve the problem, a new delay time modulation mechanism is developed as Fig. 1. We proved the validity of the new method by applying it to p-WSe₂ sample as Fig.2. At the presentation, the technical details will be discussed.

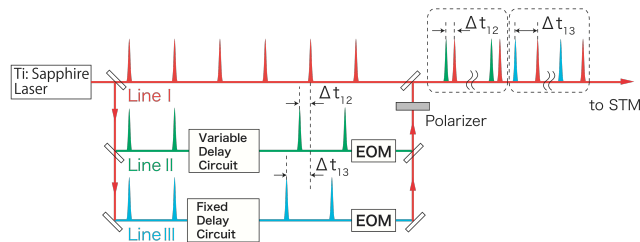


Fig.1: Schematic of Time-resolved STM with switching optical paths

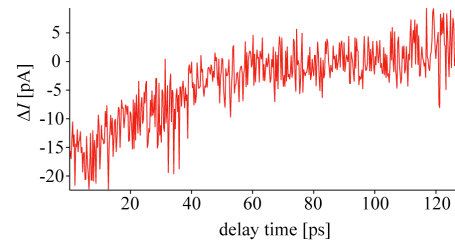


Fig. 2: SPPX-STMX spectra of WSe₂