Detailed work plan of the STSM:

Ultrafast spectroscopy of the tropyl radical and *para*-xylylene

18.3-24.3: The tropyl radical is an instable molecule and needs to be produced on the spot under collision-free conditions from a suitable precursor. Bitropyl is chosen as a precursor with pyrolysis as the production method. Bitropyl is a solid and needs to be heated to seed it into gas phase. The experimental conditions therefore have to be carefully optimized to exclude dimerization during the pyrolysis and as to obtain a cold supersonic beam. This first week will also serve to familiarize myself with the experimental setup. First pump-probe experiments with 266 nm as a pump and 800 nm as a probe are started.

27.3-31.3: The pump-probe experiments with 266 nm as a pump and 800 nm as a probe are to be completed this week. Two detection methods will be employed, photoelectron imaging and mass spectroscopy. If necessary, time-resolved photoion images will be recorded as well. With the help of Dr. Lionel Poisson the results will be analyzed after recording the data.

3.4-7.4: The probe wavelength will be changed to 400 nm and the experiments of the previous week repeated with this new probe wavelength. With different probe wavelengths an insight can be gained into the ionization mechanisms, since different intermediary states are accessible during ionization.

10.4-14.4: *Para*-xylylene is a biradical and also needs to be produced on the spot with pyrolysis. The chosen precursor is [2.2]paracyclophane, which is also a solid. During this week the pyrolysis and production conditions of *para*-xylylene will be optimized. First pump-probe experiments with 266 nm as the pump wavelength and 800 nm as the probe wavelength will be undertaken.

17.4-21.4: Just as for the tropyl radical, these pump-probe experiments with photoelectron imaging and mass spectrometry as the detection methods will be completed this week. If doubts arise whether the observed signal stems from the *para*-xylylene produced via pyrolysis or from *para*-xylylene produced via dissociative photoionization from the precursor, time-resolved ion images will be recorded.

24.4-28.4: The probe wavelength is changed to 400 nm and the experiments of the previous week are repeated. During this last week the results obtained during the last 6 weeks will be discussed thoroughly with Dr. Poisson and the course of action concerning publications of the results will be discussed.