

Measurements on the laser-aligned CS_2 molecules with the undulator radiation

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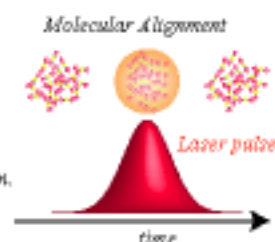
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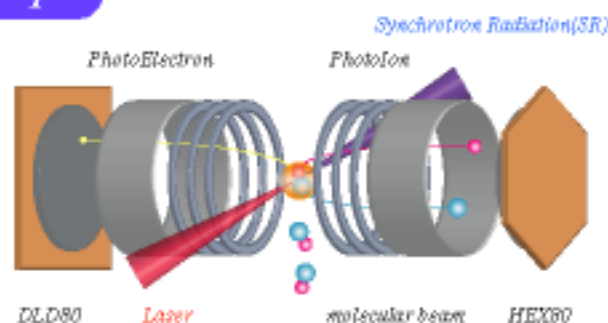
Introduction

The molecular alignment is a characteristic feature in intense laser fields.

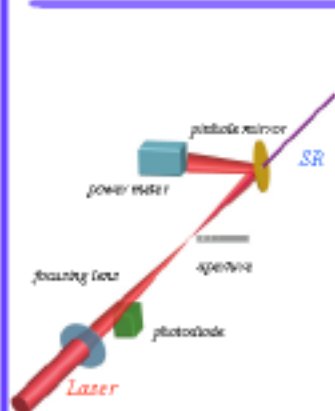
We have started the project to investigate the behaviors of the molecules in the intense laser fields with undulator radiation.



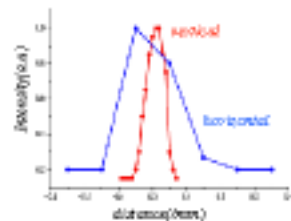
Experiment



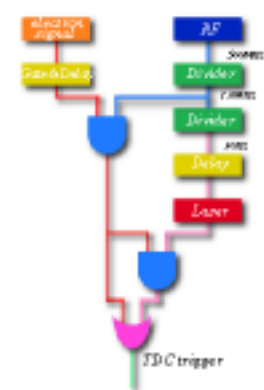
Coincidence Velocity Imaging Spectroscopy



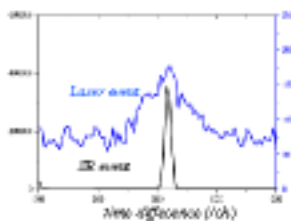
Overlapping in space and time between Laser and SR



Beam profile of SR

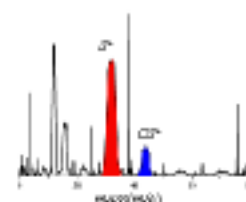


Logic Circuit for Synchronization between Laser and SR



TimeCorrelation(LR-start, SR-stop)

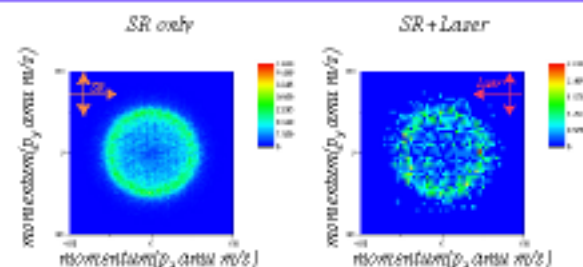
Result and Discussion



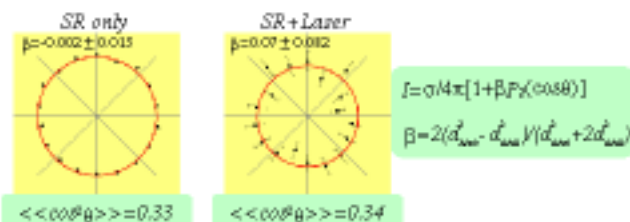
TOP (e-start, ion stop)

Experimental Condition

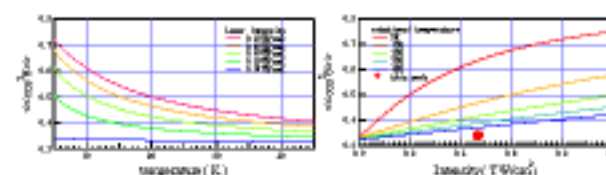
Sample: CS_2 (10% He buffer),
 3.0×10^{-7} Torr @ interaction chamber
 Laser: 1064nm, 11.7 nps, 30Hz
 focused @ 575 μ m 0.477 TW/cm²
 SR: 0th order (fundamental energy 31.3eV),
 100 μ m, 6MHz
 Dwell time: 15 laser



(CS^+ , S^+) Coincidence Momentum Image (CMI)



Angular Distribution of S^+



Simulation of the degree of alignment

Summary

- We have succeeded to overlap in time and space between Laser and Synchrotron Radiation.
- We have measured aligned CS_2 molecule first time.
- For the observation of more aligned CS_2 , we need to
 1. Cool the rotational temperature of CS_2 .
 2. Overlap in space with more accuracy.
 3. Improve statistical accuracy.