

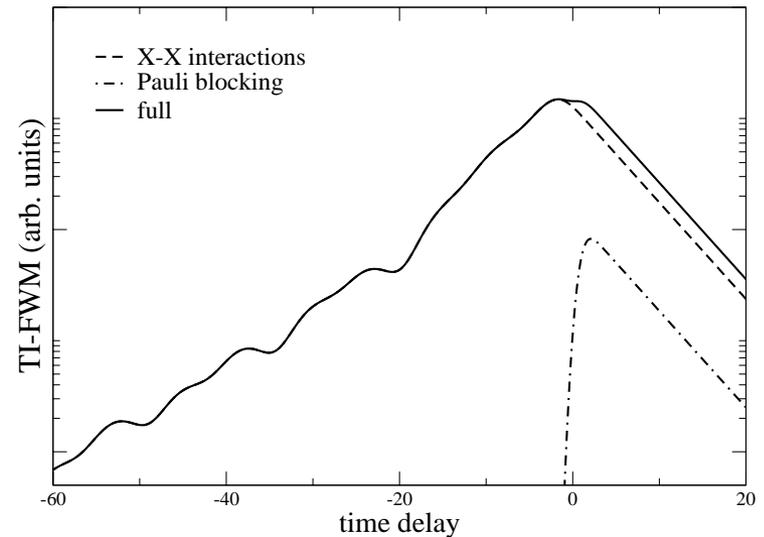
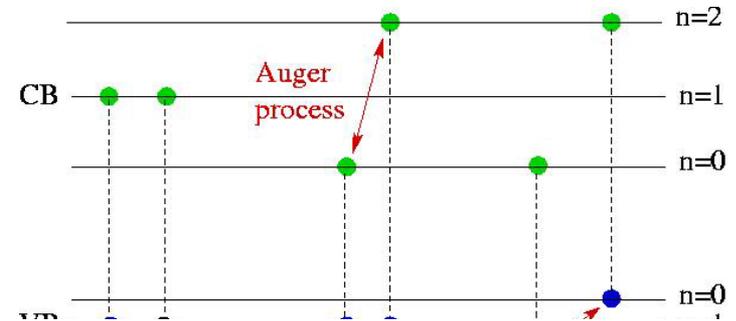
# RUI: Spectroscopy of Many-Body Processes in Semiconductor Nanostructures

Tigran V. Shahbazyan, Jackson State University, DMR-0305557

## Ultrafast Dynamics of Quantum Well Excitons in Strong Magnetic Field

T. V. Shahbazyan (JSU), N. Fromer, and D. S. Chemla (LBNL)

In strong magnetic field, the role of many-body interactions in 2D systems is greatly enhanced. We studied the ultrafast *nonlinear* optical response of 2D magnetoexcitons, and found that it is completely dominated by inter-Landau-level Auger scattering of electrons and holes. The *coherent* Auger dynamics manifests itself in quantum beats of four-wave-mixing signal at negative time-delays originating from the interference of two-exciton states, originally excited at  $n=1$  Landau level, which are related to each other via Auger scattering processes.



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## Education and Outreach:

Two undergraduate students (Kendrik Walker and Ayosha Alam) have been supported through this grant as research assistants. Student research at JSU is conducted in the general framework of NSF Nanotechnology Undergraduate Education program at Physics Department. During past year, 11 students from traditionally underrepresented groups, including female students) have been involved in various research projects with several faculty. These activities resulted in student presentations at four conferences. All students participated in summer programs at research sites at JSU, Cornell University, Lawrence Livermore National Laboratory and Northrop Grumman.

