

DEPARTMENT OF PHYSICS & ASTRONOMY
CONDENSED MATTER SEMINAR

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Ames Lab

**Dressed States and Multi-Photon
Resonances in Strongly Driven Ensemble
of Weakly Coupled Spin-Pairs**

Despite the apparent simplicity, two-level systems (TLS) are very important for modeling various physical problems and provide a testing ground for exploring genuine quantum-mechanical systems. Under the influence of strong time-dependent driving fields, TLS develop dressed states leading to a variety of effects relevant to such active areas as quantum computing, atomic physics, and magnetic resonance, to name a few. In the opening part of my talk I will review a theoretical approach to periodically driven TLS based on the Floquet's theorem. It will be demonstrated that the Floquet approach provides a natural analytical description for the dressed states and multi-photon transitions. In the main part of my talk I will introduce the spin-pair model of electrically and optically detected magnetic resonance (EDMR and ODMR) and discuss its analytical solution based on the Floquet approach. I will conclude by presenting our theoretical predictions for electrically detected multi-photon resonances and relating them to the results of a recent EDMR experiment on an organic semiconducting polymer.

Tuesday, August 20, 2019

JFB 334

4:00 pm

Refreshments will be served in JFB 334 at 3:45 pm