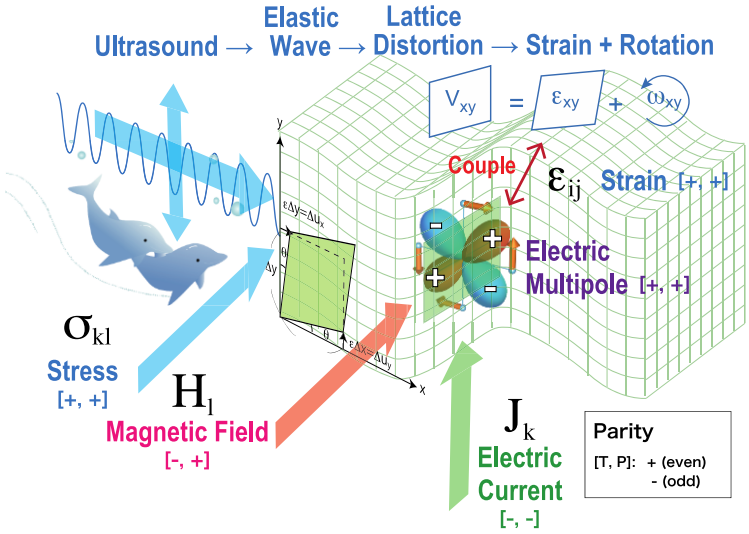
PHYSICS COLLOQUIUM



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Research on the Quadrupolar Kondo Effect via Ultrasonic Measurements

Abstract

Ultrasonic measurement is one of the unique and powerful techniques to probe anisotropic local charge distributions and fluctuations in solids associated with the electric quadrupole or hexadecapole of *d*- or *f*-orbital, which are difficult to be detected by a typical technique as electrical resistivity. In general, the principle of the ultrasonic measurement in solids is based on motoring local strains of the lattice induced by a propagating elastic wave, which is coupled to the local charge distribution and interaction between charge and lattice vibration. As a result, the longitudinal and transverse acoustic waves can observe the multipolar responses of different symmetries “spectroscopically”. Therefore, the ultrasonic method can directly observe the electric quadrupolar susceptibility of the non-magnetic, non-Kramers doublet with Γ_3 symmetry, in particular, which is generally hard to observe in other measurement techniques. In this talk, I will present our recent progress of the ultrasonic studies on rare-earth intermetallic compounds at very low temperatures and under a high-magnetic field. Strong experimental evidence shows that the quadrupolar Kondo effect theory, which is the two-channel version of the multi-channel Kondo effect, can be verified by experimental data

3:00 p.m. – 4:30 pm, Friday, May 6th,
In-Person: McLane 162