

Long Meng

Title: Regularity of N quantum bodies solutions and application to numerical analysis

Abstract: The electronic quasi-relativistic equation is one kind of quasi-relativistic equation with the Coulomb forces in the field. It is more general than the electronic Schrödinger equation which has been analyzed by Harry Yserentant with the Pauli principle by Hardy inequality. In this talk, we will use the similar idea to analyze the electronic relativistic equation. But it is much more arduous. We can not get coercivity directly, and according to cusp analysis, we even can not use integer derivatives. In this article, we will overcome all of them by some ingenious skills. It is shown that these wave functions possess certain square integrable mixed weak derivatives of order $N/4+1/2$ with the N the number of electrons, across the singularities of the interaction potentials.