Partial Differential Equations Seminar

Title On the scattering of Hartree type Dirac equations

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Abstract

In this talk we consider Cauchy problem of the Hartree-type nonlinear Dirac equation with potentials given by $V_b(x) = ₩frac1{ 4π} ₩frac{e^{−b|x|}}{ |x| }(b ≥ 0). In the previous works, a standard argument is to utilize null form estimates in order to prove global well-posedness for H^s-data, $s > 0$. However, the null structure inside the equations is not enough to attain the critical regularity. We impose an extra regularity assumption with respect to the angular variable. Firstly, I will introduce the global wellposedness and scattering of Dirac equations with Hartree-type nonlinearity for b > 0 for small L^2_x-data with additional angular regularity. Secondly, a non-scattering result will be discussed for a certain class of solutions with the Coulomb potential b = 0.