

Asymptotic Behavior for the Maxwell-Dirac System in Lorenz and Coulomb Gauges

Kiyeon Lee

KAIST, Daejeon, South Korea and University of Michigan, Ann Arbor, USA
KIYEONLEE@KAIST.AC.KR

Abstract

In this talk, I will present the nonlinear scattering results for the Maxwell-Dirac system in the Coulomb gauge. In the Lorenz gauge, we obtained the nonlinear scattering results in Cho-Lee ([1]). Using this approach, we also prove nonlinear scattering in the Coulomb gauge. Although the Coulomb gauge lacks Lorentz invariance, it allows the elliptic nature of the scalar potential to be exploited. We introduce a spinorial null structure to overcome the lack of Lorentz invariance and to obtain the desired asymptotic behavior. Moreover, the vector field method combined with various resonance analyses adapted to the Coulomb gauge will be discussed.

References

- [1] Y. Cho and K. Lee, *Global dynamics for the Maxwell-Dirac system*, Preprint, <https://arxiv.org/abs/2406.18887>