SCATTERING FOR A 3D COUPLED NONLINEAR SCHRÖDINGER SYSTEM

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Abstract. We consider the three-dimensional cubic nonlinear Schrödinger system

$$\begin{cases} i\partial_t u + \Delta u + (|u|^2 + \beta|v|^2)u = 0, \\ i\partial_t v + \Delta v + (|v|^2 + \beta|u|^2)v = 0. \end{cases}$$

Let (P, Q) be any ground state solution of the above Schrödinger system. We show that for any initial data (u_0, v_0) in $H^1(\mathbb{R}^3) \times H^1(\mathbb{R}^3)$ satisfying $M(u_0, v_0)A(u_0, v_0) < M(P, Q)A(P, Q)$ and $M(u_0, v_0)E(u_0, v_0) < M(P, Q)E(P, Q)$, where $M(u, v)$ and $E(u, v)$ are the mass and energy (invariant quantities) associated to the system, the corresponding solution is global in $H^1(\mathbb{R}^3) \times H^1(\mathbb{R}^3)$ and scatters. Our approach is in the same spirit of Duyckaerts-Holmer-Roudenko, where the authors considered the 3D cubic nonlinear Schrödinger equation. Joint work with L.G. Farah (UFMG).