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Kenji Nakanishi and **Tuoc Van Phan*** (phan@math.utk.edu), 227 Ayres Hall, 1403 Circle Drive, Knoxville, TN 37996-1320, and **Tai-Peng Tsai**. *Small solutions of nonlinear Schrödinger equations near first excited states.*

Consider a nonlinear Schrödinger equation in \mathbb{R}^3 whose linear part has three or more eigenvalues satisfying some resonance conditions. Solutions which are initially small in $H^1 \cap L^1(\mathbb{R}^3)$ and inside a neighborhood of the first excited state family are shown to converge to either a first excited state or a ground state at time infinity. An essential part of our analysis is on the linear and nonlinear estimates near nonlinear excited states, around which the linearized operators have eigenvalues with nonzero real parts and their corresponding eigenfunctions are not uniformly localized in space.

This is the joint work with Kenji Nakanishi and Tai-Peng Tsai. (Received August 15, 2011)