

ANALYSIS SEMINAR

**Local linking and its applications to indefinite
Schrodinger type equations****Shibo Liu**

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Abstract. In the last two decades, nonlinear Schrodinger type equations, such as Schrodinger-Poisson systems, Schrodinger-Kirchhoff equations and quasilinear Schrodinger equations, have captured great interests in the field on nonlinear analysis. Most of the results require that the Schrodinger operator is positive definite, so that the zero function is a local minimizer of the variational functional and the mountain pass theorem applies. We are interested in the case that the Schrodinger operator is indefinite. It turns out that unlike semilinear Schrodinger equations, the classical minimax theorems such as the linking theorem, are also not applicable. We found that the concept of local linking introduced by Shujie Li and Jiaquan Liu in the 1980's, is suitable for this kind of problems. In this talk I will present our recent results for such problems, obtained by applying local linking theory and Morse theory.