1021-35-96 **XIANJIN CHEN*** (`xjchen@math.tamu.edu`), Department of Mathematics, Texas A&M University, Mailstop 3368, College Station, TX 77843-3368, and **JIANXIN ZHOU**. *On characterization of multiple solutions to two classes of nonlinear elliptic systems.* Preliminary report.

We investigate a local characterization of multiple solutions to nonlinear elliptic systems of variational type. In particular, we consider nonlinear elliptic systems of which energy functionals are strongly indefinite. Typical examples include a class of noncooperative elliptic systems of the form

$$\begin{cases} -\Delta u &=& F_u(x; u, v) & x \in \Omega \\ -\Delta v &=& -F_v(x; u, v) & x \in \Omega \end{cases} \tag{1}$$

and a class of hamiltonian elliptic systems of the form

$$\begin{cases} -\Delta \bar{u} &=& G_{\bar{v}}(x; \bar{u}, \bar{v}) & x \in \Omega \\ -\Delta \bar{v} &=& G_{\bar{u}}(x; \bar{u}, \bar{v}) & x \in \Omega \end{cases} \tag{2}$$

where the functions $F, G : \overline{\Omega} \times \mathbb{R}^2 \to \mathbb{R}$ are of class $\mathcal{C}^1$ in the variables $(u, v) \in \mathbb{R}^2$ and $(\bar{u}, \bar{v}) \in \mathbb{R}^2$, respectively. In either case, Dirichlet boundary conditions are assumed. We explore an equivalent relation between those two classes of systems. Due to this equivalence, an efficient algorithm aimed at finding multiple solutions to hamiltonian elliptic systems can be devised. (Received August 29, 2006)