1036-35-43   **Tri Minh Nguyen*** (`triminh@math.ac.vn`), Department of Mathematics, University of Chicago, 5434 University Avenue, Chicago, IL 60637-1546. *Smoothness of solutions of some classes of semilinear elliptic degenerate equations.*

In this talk we will consider regularity of solutions of semilinear differential equations principal parts of which are linear polynomial operators constructed from real vector fields. We discuss the results under general assumptions and also present concrete illustrations. The method we used to obtain the results is: based on the study of fine properties of the principal linear parts in the weighted Sobolev spaces naturally associated with the vector fields, we then obtain the regularity of solutions of the nonlinear equations. As a by-product we also obtain some new results even for linear differential operators. Along the way a new condition is introduced. (Received December 18, 2007)