1002-35-210 **Alberto Bressan** and **Wen Shen\*** (shen_w@math.psu.edu), Department of Mathematics, 218 McAllister Blg, The Penn State University, University Park, PA 16802. *Semi-cooperative Strategies for Differential Games.*

The paper is concerned with a non-cooperative differential game for two players. We first consider Nash equilibrium solutions in feedback form. In this case, we show that the Cauchy problem for the value functions is generically ill-posed. Looking at vanishing viscosity approximations, one can construct special solutions in the form of chattering controls, but these also appear to be unstable.

In the second part of the paper we propose an alternative "semi-cooperative" pair of strategies for the two players, seeking a Pareto optimum instead of a Nash equilibrium. In this case, we prove that the corresponding Hamiltonian system for the value functions is always weakly hyperbolic. (Received September 14, 2004)