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Kandethody M Ramachandran* (ram@chuma.cas.usf.edu), Department of Mathematics, University of South Florida, Tampa, FL 33620-5700. *Stochastic differential games with multiple modes and a small parameter*. Preliminary report.

Two persons stochastic differential game with multiple modes where the system is driven by a wideband noise is considered. The state of the system at time t is given by a pair of continuous and discrete components. The discrete component describes the various modes of the system and takes values in a finite set. The continuous component is governed by a "controlled process" with drift vector which depends on the discrete component. Thus the state of the system, switches from one random path to another at random times as the mode changes. The discrete component is a "controlled Markov chain" with transition rate matrix depending on the continuous component. We will show that the pair of controlled wideband noise process converges to a process whose evolution is given by a "controlled diffusion process" with switching random paths. A zero-sum games will be considered. In this zero-sum game player I is trying to maximize certain expected payoff over his/her admissible strategies, whereas player II is trying to minimize the same over his/her admissible strategies. We will establish existence of randomized near optimal strategies for both players. (Received September 20, 2000)