1023-Z1-608 **Congxiao Liu*** (liu009@bama.ua.edu), 1200 University Blvd., Apt. #E-5, Tuscaloosa, AL, and **Min Sun** and **Hideo Fujiwara**. *Mathematical modeling of ferro-antiferromagnet (F-AF) exchange coupled systems.*

F-AF exchange coupled systems are modeled. The model assumes a single domain F part, surface exchange coupled with an ensemble of AF grains. The complementary nature of coercivity enhancement and exchange bias is proved for a general F-AF system. For an F-AF bilayer system, parameters of the antiferromagnet can be determined from the AF layer thickness (t_{AF}) dependence of the initial switching field H_{sw0-}. Given experimental data, estimates of those parameters are first obtained from the H_{sw0-} vs t_{AF} curve at small and large t_{AF} regions. Numerical calculation is then carried out to test the result. In the simulation, the magnetic state is determined from minimization of the total energy of the system. Conjugate Gradient scheme is used for an eighty-four grains F-AF system. The average AF anisotropy constant K_{AF}, the AF easy axes dispersion angle σ_{AF}, and the average F-AF coupling strength J_{F-AF}, are estimated for one $Ni_{80}Fe_{20}/FeMn$ F-AF bilayer. By assuming uniaxial anisotropy of the AF grains and the AF easy axes dispersion to be of a normal type, we obtained for this sample, K_{AF}=2x10^5 erg/cc, σ_{AF}=1.4 radians, and J_{F-AF}= 0.16 erg/cm^2. (Received September 25, 2006)