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Charles Knessl and **Miao Xu*** (mxu6@uic.edu). *On a free boundary problem for an American put option under the CEV process.*

We consider an American put option under the CEV process. This corresponds to a free boundary problem for a PDE. A nonlinear integral equation that satisfies the free boundary is derived from the PDE. We analyze it in the limit of small $\rho = 2r/\sigma^2$, where r is the interest rate and σ is the volatility. We employ asymptotic and perturbation methods to derive exact and approximate formulas and find that the free boundary behaves differently for five ranges of time to expiry. (Received September 16, 2010)