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([couyang@math.purdue.edu](mailto:couyang@math.purdue.edu)), 150 N. University Street, Department of Mathematics, Purdue University, West Lafayette, IN 47907, and **Tai-Ho Wang**. *Asymptotics of implied volatility in local volatility models and stochastic volatility models.*

Using the heat kernel expansion technique, we obtain an asymptotic formula for European call option prices with respect to the time to maturity. We use this formula to calculate both the leading value of the implied volatility  $\hat{\sigma}$  and the first order deviation of  $\hat{\sigma}$  from its leading value. Some geometric interpretations will be discussed for these two terms. This is a joint work with Jim Gatheral, Elton Hsu, Peter Laurence and Tai-Ho Wang. (Received January 23, 2010)