1146-65-429 **Chuan Chen***, 118 College Drive, #5043, Hattiesburg, MS 39406, and **James V Lambers** (james.lambers@usm.edu), 118 College Dr #5043, Hattiesburg, MS 39406. *Comparative Error Analysis of Numerical Methods for the Black-Scholes Equation.* Preliminary report.

The Black-Scholes equation is a partial differential equation that determines the price of a financial option under the Black-Scholes model. The idea behind the equation is that there is a perfect and risk-free way for one to hedge the options by buying and selling the underlying asset in just the right way. This hedge implies that there is only one right price for the option, as returned by the Black-Scholes formula. Traditionally, the Black-Scholes equation is solved by first being reduced to a simple heat diffusion equation through exponentially scaling and changing the variables. This conversion ensures a simpler, faster, and more practical numerical scheme. However, accuracy is often compromised and could be very unevenly distributed across the domain due to the variables being exponentially scaled. Transformation is also very limited and inflexible. For our project, we have proposed to solve the Black-Scholes equation directly using finite-difference schemes. By doing so, we can ensure robustness and accuracy. Error analysis of these two approaches are also conducted, and an assessment of the accuracy, efficiency, and robustness of each method is reported. (Received January 28, 2019)