1159-62-114 **Michael Orosz*** (mcorosz@miners.utep.edu), 500 W University Ave, El Paso, TX 79968, **Michael Pokojovy** (mpokojovy@utep.edu), 500 W University Ave, El Paso, 79968, and **Maria C. Mariani** (mcmariani@utep.edu), 500 W University Ave, El Paso, TX 79968. *Quantitative stock market modeling using multivariate geometric random walk.* Preliminary report.

We propose a new stock market model based on multivariate geometric random walk without imposing any parametric assumptions (such as Gaussianity) or structural assumptions (such as ellipticity) on the increments and establish connection with continuous-time Geometric Brownian Motion. Our approach can be applied to modeling a variety of stocks traded at multiple stock exchanges and can adequately account for heavy tails and other departures from Gaussianity. Both calibration and prediction steps are genuinely nonparametric. Model calibration involves multivariate imputation to account for partially overlapping trading hours, while prediction is performed using resampling from imputed observations. Per-comparison and simultaneous prediction regions for multiple stocks and prediction intervals for stock portfolios are constructed. Finally, our model is applied to a wide selection of stocks traded at NYSE and LSE. Analyzing three months' worth of closing stock price data collected from over 300 stocks sampled every minute, respective prediction regions are constructed and successfully "backtested" on a one-month horizon of historical data. (Received August 02, 2020)