PDF Analysis: Neural Network Synthetic Local Volatility Model
Monte Carlo with $dS_t = rS_t dt + \sigma_{NN}(t, S)S_t dW_t$

Strike Distribution (T = 0.25) — Log-Normal Distribution (T = 0.25) — Gaussian Space (T = 0.25), $\mu = 6.30$, $\sigma = 0.56$, Skew=-0.02, ExKurt=-0.02

Strike Distribution (T = 0.50) — Log-Normal Distribution (T = 0.50) — Gaussian Space (T = 0.50), $\mu = 5.94$, $\sigma = 0.76$, Skew=-0.04, ExKurt=-0.02

Strike Distribution (T = 0.75) — Log-Normal Distribution (T = 0.75) — Gaussian Space (T = 0.75), $\mu = 5.83$, $\sigma = 0.86$, Skew=-0.01, ExKurt=0.01

Strike Distribution (T = 1.00) — Log-Normal Distribution (T = 1.00) — Gaussian Space (T = 1.00), $\mu = 5.82$, $\sigma = 0.91$, Skew=-0.04, ExKurt=-0.01

Strike Distribution (T = 1.50) — Log-Normal Distribution (T = 1.50) — Gaussian Space (T = 1.50), $\mu = 5.89$, $\sigma = 0.98$, Skew=-0.02, ExKurt=-0.01

Strike Distribution (T = 2.00) — Log-Normal Distribution (T = 2.00) — Gaussian Space (T = 2.00), $\mu = 6.00$, $\sigma = 1.01$, Skew=-0.00, ExKurt=0.04

Axis labels: Density $f(K)$, Strike Price K; Density $f(\ln K)$, $\ln$(Strike Price); Density $g(x)$, $x = \frac{\ln K - \mu}{\sigma}$

Legends: Monte Carlo, NN Model; MC Log Returns, NN Model; MC (standardized), KDE of MC, NN Model $g(x)$, Standard Normal