

## Working Problems for BSE 5034 Stochastic Hydrology (2019)

### WP-4 GOFT Power Comparison

This working problem aims to assess the power of three GOF tests, namely the Chi-squared test, the KS test and the LMRD-based test.

Hypothesized distribution (Ho)	True distribution			
	Standard Normal	Standard Gumbel	Standard PT3 with skewness = 0.01	Standard PT3 with skewness = 1.14
Standard Normal				
Standard Gumbel				
Standard PT3 with skewness = 0.01			<b>Rejection rate</b>	
Standard PT3 with skewness = 1.14				

Note: Standard distributions (normal, Gumbel, PT3) are distributions of zero expectation and unit standard deviation.

#### Simulation setting

Sample size:  $n=c(25, 30, 35, 40, 45, 50, 60, 80, 100, 150, 200, 250, 300, 400, 500)$

Number of categories for the chi-squared test:  $nc=c(5, 5, 5, 5, 5, 7, 7, 8, 8, 10, 10, 15, 15, 20, 20)$

Number of simulation runs: 10000 (for every specific sample size)

Level of significance = 0.05

**CDF of Standard Gumbel (black), PT3 of skewness=1.14 (blue), standard normal (green), and PT3 of skewness=0.01 (red).**

