

Working Problems for BSE 5034 Stochastic Hydrology (2019)

WP-5 Gamma random field simulation

Simulation and verification

Parameters of the gamma density and spherical semi-variogram model designated for random field stochastic simulation.

Scenario type	Gamma density parameters				Variogram parameters		Size of simulation [†]
	μ	γ	α	λ	$\omega = \sigma^2$	a	
I	0.67	2.985	0.449	0.67	1	1, 2, 3, 6	80×80 40×40
II	1	2	1	1	1	1, 2, 3, 6	80×80 40×40
III	2	1	4	2	1	1, 2, 3, 6	80×80 40×40
IV	4	0.5	16	4	1	1, 2, 3, 6	80×80 40×40

[†]Size of simulation represents the spatial domain Ω of the random field $Z(x)$.

Consider a homogeneous gamma random field with property characterized by the scenario III of the above table (with four different values of range). For every value of range (a), simulate one realization of the gamma random field and present the result as an image of 80x80 pixels.