

Three Dimensional Synthetic Wind Field

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Abstract The Wind Energy standards[1] specifies different wind field models to simulate the turbulent inflow conditions for wind turbines. These models are generating purely Gaussian statistics for the wind fluctuations, which is in contrast to experimental data. The main idea of this work is the simulation of stochastic 3-dimensional wind fields considering advanced characterization of turbulence on scales ranging from a few meters to some hundred meters. For simulation Continuous Time Random Walk (CTRW) theory is used. The model enables to adapt parameters in order to accurately reproduce time dependent statistical features of wind turbulence. Current challenges include the proper implementation of spatial gusty structure.

References

- [1] IEC 61 400-12-1, 1st Ed. 2005-12