

Important Simulation Parameters

This document provides the important parameters of the physical system, control and ADS algorithm, data-driven training, and 16 wind speed scenarios.

The parameters of WT are shown in Table I:

TABLE I
PARAMETERS OF WT

Rated power	6 MW
Maximum limit speed	1.3 p.u.
Minimum limit speed	0.7 p.u.
Maximum power output	6.6 MW/1.1 p.u.
Minimum power output	1.2 MW/0.2 p.u.
Rotational inertia	40000000 kg-m ²
Blade pitch angle	0°
Swept area of WT blades	12076 m ²

The parameters of IEEE-39 bus test system are shown in Table II:

TABLE II
PARAMETERS OF IEEE-39 BUS TEST SYSTEM

Inherent inertia of SG	100 MW-s/Hz
System power mismatch	300 MW
Rated power of SG	150 MW
Droop coefficient of SG	80 MW/Hz

The parameters of control, coordinated iteration, and the ADS algorithm are shown in Table III:

TABLE III
PARAMETERS OF CONTROL AND THE ADS ALGORITHM

PFR time	15 s
Sampling period	0.01 s
Tolerance δ_1	0.001
Tolerance δ_2	0.001
Tolerance δ_3	0.001
Tolerance δ_4	0.001
Tolerance δ_5	0.01
Tolerance δ_6	0.01

The requirements of data-driven training are shown in Table IV:

Number of historical samples	17000
Number of augmented dimensions	100
Maximum rotor speed of WT in historical samples	1.27 p.u.
Minimum rotor speed of WT in historical samples	0.63 p.u.
Maximum power output of WT in historical samples	1.5 MW
Minimum power output of WT in historical samples	6.3 MW

Moreover, 16 wind speed scenarios of each wind farms for test are shown in Fig. 1 to Fig. 3:

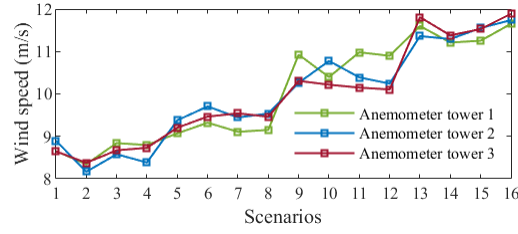


Fig. 1. Test scenarios of wind farm 1

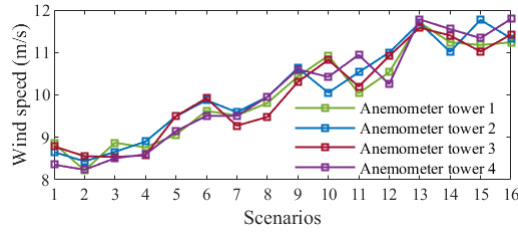


Fig. 2. Test scenarios of wind farm 2

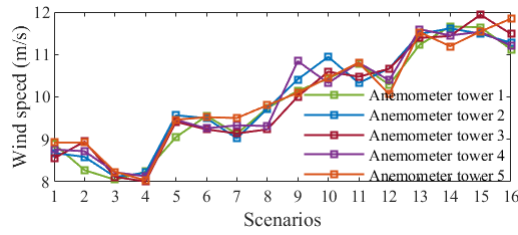


Fig. 3. Test scenarios of wind farm 3

The structure chart of IEEE-39 bus test system is shown in Fig. 4:

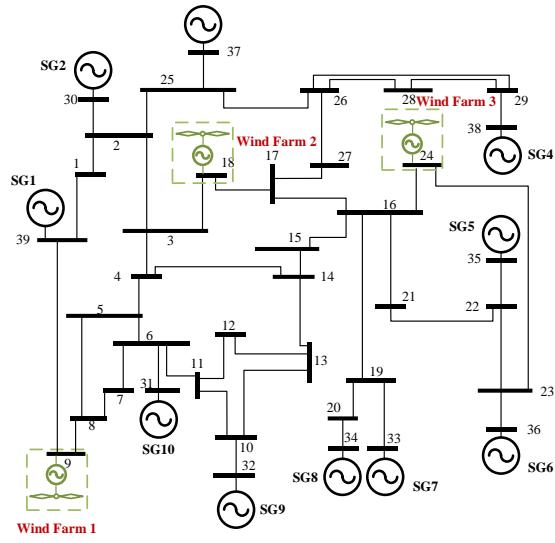


Fig. 4. IEEE 39-bus test system with three wind farms.