1. Record Nr. UNINA9910254339703321

Autore	Han Qingkai
Titolo	Dynamics and Vibration Analyses of Gearbox in Wind Turbine / / by Qingkai Han, Jing Wei, Qingpeng Han, Hao Zhang
Pubbl/distr/stampa	Singapore : , : Springer Singapore : , : Imprint : Springer, , 2017
ISBN	981-10-2747-1
Edizione	[1st ed. 2017.]
Descrizione fisica	1 online resource (XII, 164 p. 88 illus., 68 illus. in color.)
Disciplina	620
Soggetti	Vibration Dynamics Statistical physics Renewable energy resources Fluid mechanics Vibration, Dynamical Systems, Control Applications of Nonlinear Dynamics and Chaos Theory Renewable and Green Energy Engineering Fluid Dynamics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references at the end of each chapters.
Nota di contenuto	Introduction -- Structure Description and Modeling Methods -- Torsional Dynamics of Geared Rotor System in Wind Turbine Gearbox -- Parameter optimization for planetary gear system based on torsional dynamics -- The influence of shaft misalignment on PLSC and SLSC of geared rotor systems based on torsional dynamics -- Modal analyses based on the whole gearbox FE model -- Vibration measurements of gearbox -- Vibration signal analyses of gearbox in time domain, frequency domain and time-frequency domains -- Conclusions.
Sommario/riassunto	This book explores the dynamics and vibration properties of gearboxes, with a focus on geared rotor systems. It discusses mechanical theories, finite-element based simulations, experimental measurements and vibration signal processing techniques. It introduces the vibration-resonance calculation method for the geared rotor system in wind turbines and load sharing of the planetary gear

train, and offers a method for calculating the vibrations of geared rotor systems under either internal excitations from gear sets or external loads transferred from wind loads. It also defines and elaborates on parameter optimization for planetary gear systems based on the torsional dynamics of wind-turbine geared rotor systems. Moreover, it describes experimental measurements of vibrations on the wind-turbine gearbox performed on the test rig and on site, and analyzes the vibration signals of different testing points, showing them in both time and frequency domains. Lastly, it lists the gear coupling frequencies and fault characteristic frequencies from the vibrations of the gearbox housing. The technologies and results presented are valuable resources for use in dynamic design, vibration prediction and analysis of gearboxes and geared rotor systems in wind turbines as well as many other machines. .