State evaluation of wind turbine roller bearing based on normal samples

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Abstract: Due to the complex operating condition of wind turbine and lack of its fault samples, it is difficult to effectively diagnose its faults, thus a state evaluation method of wind turbine roller bearing based on normal samples is proposed in this paper. The method makes full use of monitoring data of wind turbine in its normal conditions and establishes a mapping between bearing condition parameters and wind speed, rotating speed by using radial basis function interpolation theory. The vibration deviation is used to effectively evaluate real-time running condition of wind turbine roller bearing. The results of data analysis show that the method can overcome the shortcomings of a single static threshold alarm and effectively identify existing abnormalities of wind turbine bearing under the time-variant conditions of wind turbine. This paper provides a new way for state evaluation of bearings.

Key words: wind turbine; roller bearing; healthy samples; radial basis function interpolation; condition assessment