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Stereo Monitoring and Analysis on Wind Energy Source in Chongqing

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Authors	Yan Ying Chen , Yang Sheng You , Yang Hua Gao , Qin Du , Yun Hui Tang
Keywords	Complemental Meteorology Station , Observing Wind Data , Professional Observing Tower , Stereo Monitoring , Wind Energy Resource
Abstract	In this paper, sequential 12 months' wind data was used which is obtained from professional observing towers and meteorological stations in Chongqing. Wind energy source was calculated and analyzed. The results of calculation and analysis based on stereo monitoring data to wind resource in Chongqing showed as following: (1) Data of meteorological stations can be used to accurately evaluate wind energy source in Chongqing; (2) There are developable wind energy source at present technology level in Chongqing; (3) Vertical profile of wind speed fitted power exponent relationship.
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Stereo monitoring and analysis on wind energy source in Chongqing

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Keywords: Wind energy resource, Professional observing tower, Complemental meteorology station, Observing wind data, Stereo monitoring

Abstract: In this paper, sequential 12 months' wind data was used which is obtained from professional observing towers and meteorological stations in Chongqing. Wind energy source was calculated and analyzed. The results of calculation and analysis based on stereo monitoring data to wind resource in Chongqing showed as following: (1) Data of meteorological stations can be used to accurately evaluate wind energy source in Chongqing; (2) There are developable wind energy source at present technology level in Chongqing; (3) Vertical profile of wind speed fitted power exponent relationship.

Introduction

With the increase of energy source consumption and the decrease of conventional energy sources, new energy development and utilization is impending. As a clean and renewable energy, wind energy has obvious advantages to conventional energy. Here the wind energy source is that can be exploited on current levels of technique. To clarify the reserves and distribution of wind energy, Chinese Academy of Meteorology Sciences has successively organized three times countrywide surveys on wind energy from 1980 to 2004 years. The data of surveys were all from 10m observing wind based on meteorological stations of meteorological departments[1][2]. There were advantages and deficiencies using meteorological data to calculate wind energy. The followings are advantages such as enough data, reliable method, exact calculation results, giving reserves and distribution. While there also are deficiencies that are the number of meteorological stations limited and sparse in spatial which were set up those town areas with flat landform and concentrated population. So that meteorological stations can't represent wider other area with high altitude and complex terrain there are no meteorological stations or far away from the stations. Its calculation results had deviation from the fact so the result can't represent the act character of wind energy resource. While In some regions, the quantity of wind resources not only is quantity and quality, but also has relation to the energy structure and its strategic development direction of the area. So it is Significant to well and truly evaluate wind energy source.

During the third survey on wind resource all over the China, Chongqing Institute of Meteorological Sciences simulated wind speed and wind energy density with GIS technology, and at the same time the data from Jinshan mountain station and Climate survey data from Tiefengshan mountain in 1983 were utilized. The result indicated that wind speed changes obviously with altering of altitude and slope direction and the wind speed of mountains was more bigger than that of meteorological stations[3]. Chongqing Institute of Meteorological Sciences pointed out there is wind energy resource that can be developed and utilized in Chongqing in the report of the third wind energy source survey. This result indicated that those calculated reserves and distributions of wind energy resource can be calculated more accurately[4][5][6].



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