A Big Earth Data Platform for Three Poles

**Monthly average wind energy resource distribution data with 3 km resolution over Qinghai Tibet Plateau (1995-2016)**

1、Description

The monthly mean wind speed grid data of 3 km resolution over the Qinghai Tibet Plateau is based on the meteorological element database developed by the National Climate Center for Mesoscale Numerical Simulation of long-term time series, with a horizontal resolution of 3 km × 3 km, time resolution 1 hour, time length 1995 ⁓ 2016. The establishment of the database adopts the double nested numerical simulation method of WRF mesoscale model, with the outer grid distance of 9 km, covering most of Eurasia; There are four internal weight grids with a grid distance of 3 km, covering the land and sea areas of China, and the fourth calculation area covers the Qinghai Tibet Plateau (Fig. 1). The top height of WRF model is 10 HPA, with 36 layers in the vertical direction, and 9 layers from the ground to the height of 200 m. The physical process parameterization schemes include Thompson (outer heavy grid) and wsm6 (inner heavy grid) microphysical parameterization schemes; The k-f cumulus parameterization scheme is set in the outer grid, and the cumulus convection parameterization scheme is not set in the second grid; Rrtm (rapid radiative transfer model) long wave radiation parameterization scheme; Dudhia shortwave radiation parameterization scheme; Acm2 boundary layer parameterization scheme; Noah land surface parameterization scheme. The four-dimensional data assimilation technology is used in the numerical simulation, which integrates the grid reanalysis data of global atmospheric circulation model (cfsv2), oisst sea surface temperature data, and the time observation data of more than 2400 surface weather stations and 160 radiosonde weather stations in China.
In 2009, China Meteorological Administration established a national wind energy resources professional observation network including 400 wind towers, including 329 70 m wind towers, 68 100 m wind towers and 3 120 m wind towers, which were gradually completed from 2008 to 2009, and mainly distributed in regions rich in wind energy resources in China. Based on the hourly wind direction and wind speed observation data of a complete year from January 2009 to December 2010 at the height of 70 m of the wind tower, the wind speed simulation results of the mesoscale WRF model (horizontal resolution 3 km) output in the same period were analyzed × 3 km), excluding the observation data integrity rate of less than 90% and the annual average wind speed of less than 3.8 m / s, there are 354 wind measuring towers actually used for error test, and the sample number of each tower is about 8700 hours. The results show that the relative error between the measured wind speed and the numerical simulation wind speed is less than 5% in 49% of the tower tests; The relative error is 5-10% for 28% of the wind towers; The relative error of 14.4% wind tower is 10-15%; The relative error of 5.6% wind tower is 15-20%; The relative error of 3% wind tower is more than 20%. The anemometer towers with large relative errors are mainly distributed in mountainous areas with complex inland terrain and coastal mountainous areas. In addition, the correlation coefficient of hourly wind speed comparison across the country is 0.6, and the correlation coefficient of average wind speed in 16 directions is 0.8, which is more than 99.9% of the statistical significance test. It shows that the temporal and spatial variation characteristics of numerical simulation wind speed are consistent with the variation of measured wind speed. There are no anemometer towers in Tibet. There are 13 anemometer towers in Qinghai Province. The relative errors of 6 towers are less than 5%, 3 towers are 5-10%, 3 towers are 10-15%, and 1 tower is 15-20%.

2、Keywords

Theme：Winds,wind speed
Discipline：Atmosphere
Places：Qinghai-Tibetan plateau
Time：monthly mean, 1995-2016

3、Data details

1.Scale：None

2.Projection：Lambert\_Conformal\_Conic

3.Filesize：26.2MB

4.Data format：None

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：40.0 | - |
| west：73.5 | - | east：104.5 |
| - | south：26.0 | - |

5、Time frame:1994-12-31 16:00:00+00:00--2016-12-30 16:00:00+00:00

6、Reference method

References to data:

SUN Chaoyang, ZHU Rong. Monthly average wind energy resource distribution data with 3 km resolution over Qinghai Tibet Plateau (1995-2016). A Big Earth Data Platform for Three Poles, doi:10.11888/Meteoro.tpdc.2712672021

References to articles:

7、Supporting project information

Second Tibetan Plateau Scientific Expedition Program

8、Data resource provider

name: ZHU Rong
unit:
email: rongzhu@cma.gov.cn

name: SUN Chaoyang
unit:
email: sunchaoy@cma.gov.cn