A Big Earth Data Platform for Three Poles

**Indian Ocean Tropical cyclone best track and satellite-based precipitation and convection datasets（1978-2019；2000-2019）**

1、Description

The accuracy of tropical cyclone (tropical storm) track forecasting improved by nearly 50% for lead times of 24–72 h since 1990s. Over the same period forecasting of tropical cyclone intensity showed only limited improvement. Given the limited prediction skill of models of tropical cyclone intensity based on environmental properties, there have been a wealth of studies of the role of internal dynamical processes of tropical cyclones, which are largely linked to precipitation properties and convective processes. The release of latent heat by convection in the inner core of a tropical cyclone is considered crucial to tropical cyclone intensification. 16-year satellite-based precipitation, and clouds top infrared brightness temperature were used to explore the relationship between precipitation, convective cloud, and tropical cyclone intensity change. The 6-hourly TC centers were linearly interpolated to give the hourly and half hourly tropical cyclone center positions, to match the temporal resolution of the precipitation and clouds top infrared brightness temperature.
More precipitation is found as storms intensify, while tropical cyclone 24 h future intensity change is closely connected with very deep convective clouds with IR BT < 208 K. Intensifying tropical cyclones follow the occurrence of colder clouds with IR BT < 208 K with greater areal extents. As an indicator of very deep convective clouds, IR BT < 208 K is suggested to be a good predictor of tropical cyclone intensity change（Ruan&Wu，2018，GRL）. The properties of the satellite-based precipitation, and clouds top infrared brightness temperature are therefore suggested to be important measurements to study tropical cyclone intensity, intensity change and their underlying mechanisms. The high resolution of the satellite-based precipitation (3h), and cloud top infrared brightness temperature (half hour) datasets also makes them possible to be used to study tropical cyclone variability associated with diurnal cycle.

2、Keywords

Theme：Typhoon,Meteorological hazards,Precipitation,Storms,Typhoons,Precipitation amount,Meteorological Disaster,Extreme Precipitation,Natural Disaster
Discipline：Atmosphere,Human-nature Relationship
Places：Indian Ocean
Time：1978-2019, 2000-20192000-2019,

3、Data details

1.Scale：None

2.Projection：

3.Filesize：5000.0MB

4.Data format：None

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：25.0 | - |
| west：40.0 | - | east：110.0 |
| - | south：-45.0 | - |

5、Time frame:1999-12-31 16:00:00+00:00--2019-09-29 16:00:00+00:00

6、Reference method

References to data:

WU Qiaoyan. Indian Ocean Tropical cyclone best track and satellite-based precipitation and convection datasets（1978-2019；2000-2019）. A Big Earth Data Platform for Three Poles, doi:10.11888/Meteoro.tpdc.2710302020

References to articles:

Ruan, Z.X. and Wu\*, Q.Y. (2018). Precipitation, convective clouds and their connections with tropical cyclone intensity and intensity change. Geophysical Research Letters, 45(2), 1098-1105, DOI: 10.1002/2017GL076611.

7、Supporting project information

Pan-Third Pole Environment Study for a Green Silk Road-A CAS Strategic Priority A Program

8、Data resource provider

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