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On the kinetic energies of tropical cyclones of different origins

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However, the tropical cyclones had been examined so many years, some of their characteristics have remained unclear up till now. For example it is really hard to predict their devastating effect. In our opinion the destructive power of the cyclones could be characterized by their kinetic energy density. This measure has generally associated with maximum wind speed and the volume of the phenomena, via the angular momentum. The aim of this paper is to examine all kinds of tropical cyclones have existed at the Atlantic–, Pacific– and Indian– Ocean during the past 70–80 years in this point of view.
The kinetic energy density of different types of tropical cyclones over the Atlantic–, Pacific– and Indian Ocean was determined from 1000 hPa to 100 hPa at 100 hPa intervals. The cyclone is separated from its environment, to examine the effect of the extension on the energy density. The boundary of the cyclone was defined by an arbitrary threshold of wind speed. It is drawn where the wind speed becomes less than the 40% of the maximum speed at 900 hPa level. To investigate the time dependence of the energy density it was calculated numerically in six hour steps on the basis of the daily averaged gridded ECMWF ERA–Interim reanalysis data from 1979 to 2017 and ERA–20C reanalysis data from 1900 to 2010. Furthermore we have used GPS coordinates and NHC – National Hurricane Center data, to localize the exact location the formations.

In the discussion the time dependence of the kinetic energy density of the different cyclones are compared and analyzed.