Thesis Title	Fractal Dimension of Southeast Asia Summer Monsoon over Thailand
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Abstract

Fractal dimension is a value that represents irregularity. A high value of fractal dimension indicates strong irregularity. In this research, fractal dimension is used to investigate variation of Southeast Asia summer monsoon wind (mid May to mid October) over 5 provinces in Thailand (Chiang Mai, Ubon Ratchathani, Phuket, Songkhla and Bangkok) during the years 2003-2012. The data used for analysis are the observed surface winds from the Thai Meteorological Department and upper wind at 850 hPa from the National Center for Environmental Prediction. A new method of fractal dimension approximation called improved variation method (IVM) is proposed. This method is developed from the variation method (VM) by reducing the excessive area when the reduction factor is large. The IVM provides the value of fractal dimension that is similar to that of VM but slightly higher. Results of the analysis show that the fractal dimensions and standard deviations of fractal dimension of surface wind speed and direction are larger than those of the upper level. That is the variations of wind speed and direction at the surface are more than the variations at the 850 hPa level. The 6-hourly largest fractal dimensions for surface wind speed and direction during the 10-year period are both at Ubon Ratchathani, while the largest fractal dimensions for 850 hPa wind speed and direction are both at Bangkok.

Keywords : Fractal Dimension / Time Series / Variation Method / Wind