Detection of Monsoon Signal Observed by EAR and CHIRPS Data Analysis

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This study focused on the Equatorial Atmospheric Radar (EAR) data in detecting monsoon signal with rainfall analysis at each point of observation area. Monsoon was known as one of the climate phenomenon that affects rainfall in Indonesia. In this study, observations were made at the West Sumatera province which is located of EAR observations. Focus observations were done on three areas, namely Padang Panjang (100.4E & 0.4S), Kototabang (100.2E & 0.2S), and Sicincin (100.3E & 0.6S). Observations of rainfall conducted using data Climate Hazards Group InfraRed Precipitation with Station (CHIRPS), which is extracted using GrADS software. CHIRPS is a reanalysis rainfall data with high resolution, which is 0.05° x 0.05° or ~5km observations. The result observation by using Matlab software, known that the meridional wind profile data of EAR in Kototabang on July 2001-July 2009 period, monsoon contained in the layer 11-18 km occurs with the strongest in the lining of 14 km. Analysis of Power Spectral Density (PSD) and the wavelet transform explained monsoon oscillates around 12 monthly. Vertical profiles shows that strong monsoon occurred during the wet season, with the peak in January. The results of the analysis of CHIRPS rainfall patterns in Padang Panjang, Kototabang, and Sicincin with meridional wind, shows that Sicincin have the same patterns with monsoon. Results of statistical analysis in the form of cross-correlation between the meridional wind speed (EAR) with CHIRPS rainfall in Padang Panjang, Kototabang, and Sicincin, showed a significant correlation in the three regions. The maximum correlation is in Sicincin areas with correlation coefficient 0.5 which contained lagtime number 3, which is lag time for 3 months of the coming wind to rainfall. The positive correlation indicates that there is an indication that the winds tend from the north and causing the wet season.

Keywords: CHIRPS, EAR, GrADS, Matlab, Monsoon.