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Correlation between total precipitable water and precipitation over East Asia

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The precipitation rate(PR) and the total precipitable water(TPW) interact with various physical mechanisms. The correlation of two variables changes with difference of domain resolution and characteristics of the region. This poster analyzes the correlation between PR and TPW over East Asia using Cyclostationary Empirical Orthogonal Function(CSEOF) which is one of the PCA analysis. The CSEOF is useful to search a periodic pattern of the data. The anomalies which is subtracted climatological mean from the original data are used to represent annual cycles. Two variances of ERA-Interim Monthly Total Column Water vapor and GPCP monthly precipitation amounts with 372 time since January, 1984 to December, 2014 are decomposed into several modes separately. The first mode which explain largest variance are used in analysis. PC of both PR and TPW increase recently on mean value and amplitude, and they show considerable correlation on phase. The correlation coefficient of PR and TPW is 0.61 and maintains the same values by month. The result of harmonic analysis shows 2 to 6 year oscillations. As result of decomposed modes of two variables, there is the relationship between TPW PC series and horizontal moisture gradient. The Horizontal moist gradient can change affect moisture flux convergence which is one of important variable of rainfall events.