Rainfall estimation using total propagation differential phase shift observed by a C-band polarimetric radar

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This paper is to compare the areal rainfall estimation methods proposed by the Colorado State University (*Areal* $R_{CSU}(\Phi_{DP})$) and the National Severe Storms Laboratory (*Areal* $R_{NSSL}(\Phi_{DP})$) by using data taken from BMRC/NCAR C-band polarimetric radar (C-Pol). Three summer rainfall events at Darwin on 1999 have been caught by the D-scale rain gauge network and the C-Pol radar. This data set is used to verify the performance of these two areal rainfall estimation methods using total propagation differential phase shift amount. The rainfall estimation area divide into large area (~110km^2) and small area (~25km^2), the rainfall accumulation time divide into 3 minutes and 10 minutes. The result shows that the correlation coefficient between the rain gauge network and radar estimation rainfall are very similar for these two areal rainfall estimators. The correlation coefficients are greater than 0.95 in large area cases and greater than 0.91 in small area case. The results also show that *Areal* $R(\Phi_{DP})$ rainfall estimator is good on the convective rainfall estimation.

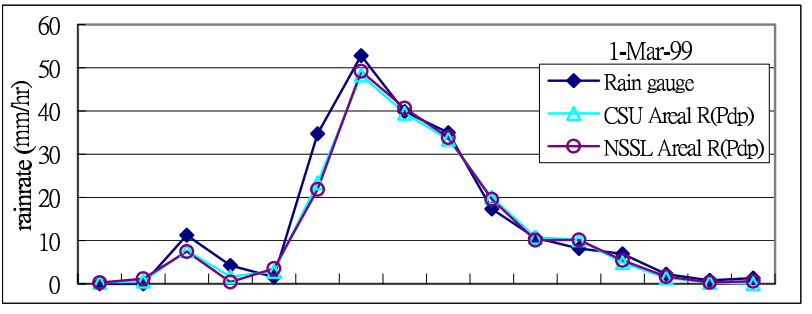

Fig 1 Time series plot (every 10 min) for one case with *Areal* $R_{CSU}(\Phi_{DP})$, *Areal* $R_{NSSL}(\Phi_{DP})$ and rain gauge average rainfall rate of large area (~110km^2).

References

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