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**Plain Language Summary:** The accurate estimation of precipitation is an important objective for the Dual-frequency Precipitation Radar (DPR), which is located on board the Global Precipitation Measurement (GPM) satellite core observatory. This study proposes a Bayesian correction (BC) approach to improve the DPR's instantaneous rainfall rate product, where ground dual-polarization radar (GR) observations are used as references. Rainfall intensities such as light, moderate, and heavy rain and their variable influences on the model's performance are considered.

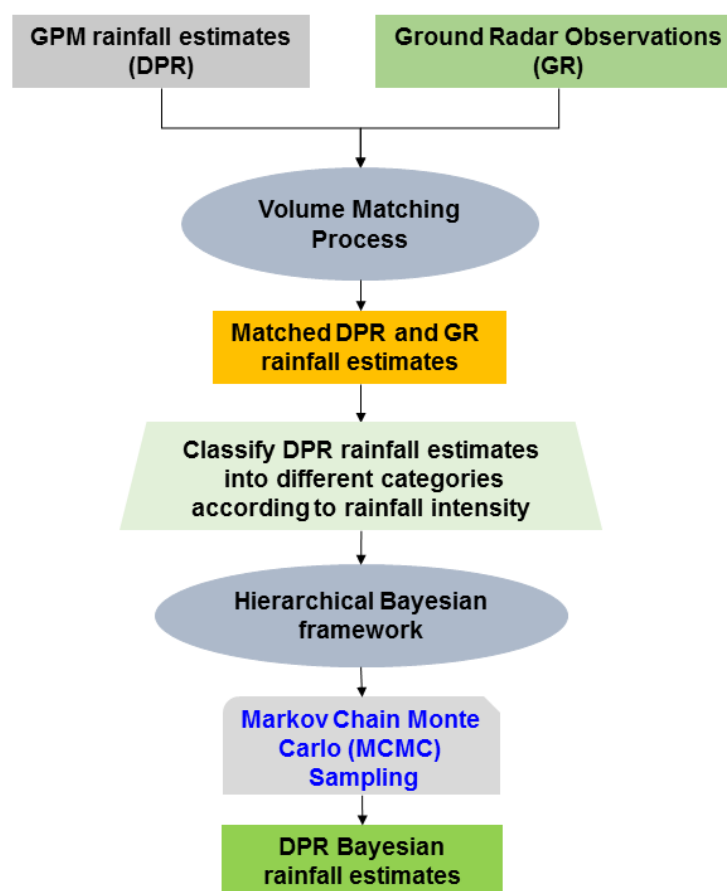


Figure 1. A sketch flowchart of the Bayesian correction (BC) approach used in this study.

- A Bayesian correction (BC) approach based on a generalized regression model is proposed.
- Observation errors in the DPR instantaneous rainfall rate estimates are analyzed as a function of rainfall intensity.
- The experiment demonstrates that the DPR\_BC rainfall rate estimates have superior skill scores and are in better agreement with the GR references than with the DPR estimates.