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Investigating uncertainties in rainfall predictions over Southeast Asia

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There are always significant uncertainties involved, when validating weather prediction or climate models. Next to uncertainty on essential information, such as initial and boundary conditions, a primary source of uncertainty is attributable to observational data used for posterior validation of model results. This is especially relevant with respect to precipitation. Precipitation remains a highly sensitive quantity, which is derived from prognostic variables in the models, be it in real-time numerical weather prediction (NWP) or for long term climate simulations. Most precipitation observations are gathered by ground-based rain gauge networks and are supplemented by satellite observations of precipitation, when ground-based observational networks are too sparse. This is especially true for data-sparse regions, such as Southeast Asia, where satellite-borne measurements of precipitation remain the only reliable data source with sufficient area coverage and temporal resolution. However, discrepancies in spatial resolution, the length of periods covered by observation record, and quality gaps amongst different satellite products give rise to uncertainty. The same applies to the uncertainties in ground-based rain gauges observations, which arise due to measurement errors, low network density and generally poor data quality. Recent advances in data handling and processing capabilities, including access to multiple sources of satellite-borne observation products, makes an efficient use of these data sources for model validation increasingly more feasible. Aim of the present paper is the investigation of the quality and of available ground-based and satellite-borne observational records of precipitation over Southeast Asia. The quality control of these observations, including an uncertainty assessment, constitutes a prerequisite for their use in NWP and climate model validation for the region of interest.