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## Improvement of interpolation schemes for APHRO\_PR, a high-resolution daily precipitation product based on rain-gauge

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Long-term and high-resolution grid precipitation product is highly demanded by meteorological or hydrological fields, because it is indispensable for evaluation of high-resolution climate models, trend analysis of precipitation extremes caused by Global Warming, budget analysis of water circulation, and so on. Many precipitation products have already issued, though many of these are insufficient in temporal and spatial resolution or length of the period for such analysis. Therefore, we started a APHRODITE project to develop historical (1961-) daily precipitation products (APHRO\_PR) with high-resolution grids (up to 0.25deg) covering the whole of Asia, based on rain gauge observation.

In this project, we have collected a huge number of rain-gauge data, most of which have not been available for public use. In addition, we have developed following new interpolation techniques. 1) Modified Shepard type interpolation considering topographical effect. 2) Catch-ratio correction of solid-form precipitation. Owing to the former scheme, precipitation distribution pattern is much improved especially in mountainous area, because of the new method calculates weight function with considering local topographical features to precipitation, while the original Shepard type scheme has no consideration without horizontal distance. In the latter scheme, correct ratio is derived by local wind speed and rain/snow distinction, which are calculated by atmospheric reanalysis data. This method decreases underestimation bias of winter precipitation amount in middle-high latitudes.

Keywords: precipitation, observation data, rain gauge, climate model, global warming, interpolation method