

The First Step Toward the Development of a Machine Learning–Based Correction for HSAF Precipitation Products over Poland

Tobiasz Górecki

Abstract

The Satellite Application Facility on Support to Operational Hydrology and Water Management (H SAF) provides operational precipitation products derived from geostationary satellite observations and Low Earth Orbit (LEO) measurements. In meteorology and hydrology, near–real-time precipitation estimates are essential for accurate forecasting of hazardous events and effective water management.

Among the primary rain rate (RR) products developed within H SAF are H40 and H60, generated from observations acquired by the Flexible Combined Imager (FCI) and the Spinning Enhanced Visible and InfraRed Imager (SEVIRI), respectively. While these products demonstrate satisfactory precision over the full-disc domain, their accuracy at local scales, particularly in mid-latitude regions such as Poland, remains insufficient for certain operational applications.

In this study, we present the first results of a precipitation correction approach for the H40 and H60 products based on machine learning (ML) techniques. The analysis focuses on mid-latitude conditions, using ground-based radar observations and rain gauge measurements over Poland as reference data for model training and validation. The main advantages and limitations of the proposed method are discussed.