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Validation of total precipitable water vapor retrieving algorithm over land using AMSR2 images

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Total precipitable water vapor (TPW) is defined as a measure of total water vapor contained in a vertical column of the atmosphere above a site with unit cross section area. TPW plays an important role in prediction of weather so that monitoring its spatial and temporal changes can help to explain the weather changes. Accurate estimation of this parameter with high spatial and temporal resolutions is challenging. The main purpose of this study is to validate an algorithm of retrieving TPW from Advanced Microwave Scanning Radiometer 2 (AMSR2) images over the land in western part of Iran. In this regard, five radiosonde stations of Tehran, Kermanshah, Isfahan, Ahvaz and Shiraz were selected as the study area and 1-year period including 80 days of four seasons since 2015 to 2016 was utilized as training and testing days. The validation results show high accuracy in the Tehran, Isfahan, and Shiraz stations with coefficient of determination (R^2), 0.919, 0.858 and 0.892, respectively and low in Kermanshah and Ahvaz with R^2 , 0.47 and 0.4, respectively. Higher values of TPW and uncommon atmospheric phenomena such as existence of dust transferred from Iraq to Kermanshah and Ahvaz may cause the lower accuracy in these two stations.

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