ACCURACY ESSESSEMENT OF NET SOLAR RADIATION EXTRACTED FROM MODIS SATELLITE IMAGES AT SURFACE AREA OF NORTH VIETNAM

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ABSTRACT: As we know that net solar radiation at terrestrial surface is a prerequisite for life on our planet. Today, standing in front of the impact of climate change, solar energy is in more interest as an unlimited renewable energy source. Solar radiation involved in the natural motor system such as carbon, water cycle, land-vegetation-atmosphere systems, and so on. In the agricultural sector, the solar radiation is the energy required for the process of photosynthesis, making the potential to turn into, to participate in the simulation models of plant growth process, affecting more to ecological system and directly or indirectly determine the quality and quantity of products. Monitoring and determining the distribution of net solar radiation at terrestrial surface is necessary issues in practice.

With advanced science and technology, net solar radiation can be extracted faster, cheaper from satellite images data on wide-scale domain for large areas. Using solar radiation data measured at a limited number of meteological stations in the field, the net solar radiation values derived from satellite imagery will be quickly adjusted with the expected accuracies. Our experiments on MODIS image shows that the net solar radiation at surface area of NorthVietnam can be extracted with the root mean square error (RMSE) of 36 $W/m^2/h$. This error is similar in comparision to the one derived in the other researches in the world.

Keyword: Net solar radiation, MODIS satellite image, transmittance, irradiance, albedo.