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ESTIMATION OF REAL-SKY GLOBAL AND DIFFUSE RADIATION FOR BRAŞOV URBAN AREA, ROMANIA

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Abstract

This paper proposes a study on the estimation of daily solar irradiation (global and diffuse irradiation) under real-sky conditions and the validation of proposed estimation models by analyzing the most important statistical indicators. Two types of regressions are proposed for the estimation of solar daily global irradiation; the first type is based on the second order degree Ångström-Prescott correlations; the second type uses the second order Ångström-Prescott correlations only for days with sunshine fraction values higher than 0.1; for days with sunshine fraction values less than 0.1, there are developed regressions depending on sunshine fraction, air temperature and amount of precipitable water. Based on the two types of models for estimating daily global irradiation, regressions to estimate the daily diffuse irradiation will also be determined. The particularization of regression coefficients is performed for basin urban area of Braşov (Romania). The proposal of some correlations having as input data, the air temperature and the amount of precipitable water was based on the following reasons: solar radiation is the main climatic factor that causes changes in other climatic parameters and the multitude of radiative factors, dynamic factors, physical-geographical factors and even those economical-geographical contribute to the individualization of Braşov urban area, giving this, its own characteristics. Finally, the statistical analysis is developed and the performances comparison of estimation models is achieved.