

## PREPARATION OF A LARGE TESTING PROCEDURE FOR MODELS OF CLEAR SKY SOLAR IRRADIANCE COMPUTATION UNDER THE CLIMATE OF ROMANIA

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**Abstract.** *The paper reports on the preparation of a country-scale experiment aiming to foster the solar irradiance computation under the climate of Romania. The experiment refers to the performance of 53 models designed to simulate the global, diffuse and direct solar irradiance. We present the research strategy, suggest model classification criteria, propose a few testing procedures, and describe the datasets used. The results can fundament the modeling of solar irradiance in Romania, with major impact on the renewable energy and meteorological applications.*

**Keywords:** solar irradiance, Romania, modeling, renewable energy

### 1. Introduction

Detailed knowledge of solar radiation availability is of fundamental importance for the successful development of solar energy projects. The appropriate design of many solar energy devices requires solar global radiation input. There are some other devices which are using concentrated radiation. In this case estimates about the level of solar beam (direct) radiation are necessary. Quantitative information about the available diffuse solar radiation has special significance for the proper design of civil and industrial buildings illumination. Besides, a profound understanding of atmospheric processes makes intensive use of solar radiation information.

Although there are several world maps of solar radiation, they are not detailed enough to be used for the determination of available solar energy on small areas. For such regions, particular approaches are required. Moreover, in most countries the spatial density of the actinometrical stations is inadequate. For example, the ratio of weather stations collecting solar radiation data relative to those collecting temperature data in the USA is approximately 1:100, and worldwide the estimate is approximately 1:500. In Romania the ratio is about 1:20.

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