Comparative study of physical models for the estimation of global tilted irradiance

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Résumé

This paper presents a comparative study including 14 physical models for estimating global tilted irradiance from global horizontal irradiance measurements. Some models are applicable to all tilt angles and orientations, while others are tailored for PV panels facing south with varying tilt angles. Additionally, some models are established in the literature, whereas others are newly developed. This work concerns PV systems with single-axis trackers and seeks to identify the optimal tilt angle for maximizing power generation across diverse sky conditions. The chosen control strategy for this endeavor is model predictive control (MPC). To effectively implement MPC in this context, it is essential to develop an efficient global tilted irradiance (GTI) forecast model.

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