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## CLEAN ENERGY RESPONSE OF PV SYSTEMS WITH AZIMUTH AND PSEUDO-EQUATORIAL TRACKING

Maria-Monica Vătășescu\*, Dorin Diaconescu

Transilvania University of Brasov, Product Design Centre for Sustainable Development, Eroilor 29, 500036, Brașov, Romania

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### Abstract

The present study proposes a comparative analysis on the clean electric energy response given by two types of PV (photovoltaic) tracking systems implemented on the same location: the azimuth and the pseudo-equatorial. The analysis is done based on an algorithm applied on the two-axes and one-axis systems. The tracking is done according to various laws, obtained by combining daily, seasonal and annual tracking programs. The algorithm and the comparative analysis are exemplified, by numerical simulations, for Brasov, Romania location. Accordingly is reported a synoptic chart of the electric energy output delivered by the azimuth and pseudo-equatorial tracked PV systems and are identified the optimum tracking solution. The results are compared based on the tracking efficiency and PV system overall efficiency values. Moreover, the annual electric energy gain is estimated by comparing: the two-axes against the one-axis, the one-axis against the fix-tilt and the two-axis against the fix-tilt tracking variants. Hence, the optimum tracking solutions for Brasov, Romania are: **a)** for relatively small PV platforms (up to 100 m<sup>2</sup>): the **one-axis pseudo-equatorial system** tracked with an annual program for the diurnal motion and a seasonal program for the elevation motion and **b)** for large PV platforms (up to 300 m<sup>2</sup>): the **two-axes azimuth system**, tracked with a seasonal program for the diurnal motion and a daily program for the elevation motion.

*Key words:* azimuth PV tracking system, pseudo-equatorial PV tracking system, PV system efficiency, tracking efficiency

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\* Author to whom all correspondence should be addressed: e-mail: [maria.vatasescu@unitbv.ro](mailto:maria.vatasescu@unitbv.ro); Phone: +40724519478