



“Gheorghe Asachi” Technical University of Iasi, Romania



DESIGN AND SIMULATION OF A PHOTOVOLTAIC STRING WITH TRACKING MECHANISM

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Abstract

The paper presents a method to improve the efficiency of a photovoltaic (PV) string by employing a mono-axis tracking mechanism. The tracking system was optimized so that it has minimum energy consumption during tracking. The PV string simultaneously changes the daily position using a linear actuator which transmits the motion to all modules by a rack-pinion gear mechanism. The system is designed in virtual prototyping concept with the following software solutions: for the solid modeling - CATIA, for developing the mechanical model as multi-body system - ADAMS, and for the control system design - MATLAB/Simulink and ADAMS/Controls. The motion law was developed by a step-by-step tracking program, the application in this paper being performed for the summer solstice day.

Key words: mechatronic system, photovoltaic string, tracking mechanism, virtual prototyping

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