

- [11] \*\*\* The board of trustees of the University of Illinois and the regents of the University of California through the Ernest Orlando Lawrence Berkeley, National Laboratory, ENERGYPLUS, EnergyPlus Engineering Document, The Reference to EnergyPlus Calculations (incaseyouwantmedtoknow), March 29, 2004.

kg/h

## VERIFIKACIJA MODELA ODREĐIVANJA POVRŠINE OZRAČENOSTI DONJEG DELA APSORBERA DVOSTRUKO OZRAČENOG RAVNOG PRIJEMNIKA SUNČEVE ENERGIJE

### VERIFICATION OF THE MODEL FOR DETERMINING THE IRRADIATED AREA OF THE LOWER ABSORBER SURFACE OF THE DOUBLE EXPOSURE FLAT-PLATE SOLAR COLLECTOR

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*U okviru ovog rada prikazana je eksperimentalna verifikacija matematičkog modela određivanja površine ozračenosti donjeg dela apsorbera dvostruko ozračenog ravnog prijemnika sunčeve energije (DPSE). DPSE je solarni prijemnik koji može apsorbovati solarno zračenje svojim gornjim kao i donjim delom apsorbera. ApSORPCIJA donjim delom apsorbera omogućena je upotrebom rane reflektujuće površine (reflektora). Reflektor, postavljen ispod i paralelno sa prijemnikom, ima približno iste dimenzije kao i prijemnik. Eksperimentalna verifikacija sprovedena je za 20. avgust 2012. godine za svaki sat počev od 09.00 h pa do 17.00 h. Odstupanja površina ozračenosti izračunatih teorijskim modelom i eksperimentalno iznose: 3,78% (09.00 h), 2,55% (10.00 h), 3,82% (11.00 h), 0,16% (12.00 h), 0% (13.00 h), 3,77% (14.00 h), 3,21% (15.00 h), 2,02% (16.00 h) i 1,07% (17.00 h). Dobijena odstupanja su posledica nesavršenosti prijemno-reflektujuće konstrukcije, neidealne paralelnosti između reflektora i prijemnika kao i neidealne refleksije zračenja sa reflektora*

*In this paper, the experimental verification of the mathematical model for determining the irradiated area of the lower absorber surface of the double exposure flat-plate solar collector (DEPFC) is presented. The DEPFC is a solar collector which can absorb solar irradiation with the upper and the lower part of its absorber. Absorption from the lower side is enabled by the application of the flat-plate reflective surface (reflector). The reflector, placed below and in parallel with the collector, has approximately the same dimensions as the collector. The experimental verification is conducted for 20<sup>th</sup> August 2012 for every hour starting from 9 a.m. until 17 p.m. Variations between the irradiated area calculated by the theoretical model and the same obtained by the experiment are as follows: 3,78% (09:00 h), 2,55% (10:00 h), 3,82% (11:00 h), 0,16% (12:00 h), 0% (13:00 h), 3,77% (14:00 h), 3,21% (15:00 h), 2,02% (16:00 h) and 1,07% (17:00 h). The obtained variations are the consequence of imperfection of the collector-reflector construction, nonideal parallelism between the reflector and the collector as well as nonideal reflection from the reflector*









