Title: Integrated Energy Systems

Ms. Devanshi Arora[1*]

[1]*Student, SRM Institute of Science and Technology, Chennai, Tamil Nadu*

**Devanshi Arora, devanshiarora_bharatbhushan@srmuniv.edu.in, +91-8968413221*

Abstract

Solar energy is radiant light and heat from the Sun that is harnessed using a range of evolving technologies such as solar heating, photovoltaics, etc. The photovoltaic system converts solar radiation into electricity. The output of the solar photo voltaic systems is strongly depending on the operating cell temperature. Several techniques have been reported in the literature to maintain the low operating temperature of the solar cell by utilizing module heat for separate thermal applications. Thermo electric power generation offer a potential application in the direct conversion of waste heat energy into electrical power where it is unnecessary to consider the cost of the thermal energy input. Integration of photovoltaic-thermo electric system is one of these techniques. In these systems, the hot junctions of thermo-electric modules are coupled with the photo voltaic. The thermo electric module uses heat from photovoltaic system and generates additional power. This study concentrates on the analyzation and optimization of the integration of photovoltaic cell and thermoelectric device. This is also followed by the production of a customized thermoelectric device using copper electrode and polyurethane foam. Like all other semiconductor devices, solar cells are sensitive to temperature. Increases in temperature reduce the band gap of a semiconductor, thereby affecting most of the semiconductor material parameters. Results show that adding TEG could minimize the PV cell temperature increase, hence improving PV cell performance effectively. Results also indicate that, with TEG, the power generation by PV cells increases at least 14% and the power generation by TEG increases at least 60% due to the decreasing thermal contact resistance.

References

[1] Sun Kim, Seongho Kim, Yong Jun Kim, Hyeongdo Choi, Byung Jin Cho, **Flexible heatsink based on a phase-change material for a wearable thermoelectric generator** of (*School of Electrical Engineering, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, 34141, Republic of Korea)* ***Article history:*** Received 19 November 2018

[2] Sarveshwar Singha, Onyebuchi Isreal Ibeagwub, Ravita Lambac, **Thermodynamic evaluation of irreversibility and optimum performance of a concentrated PV-TEG cogenerated hybrid system** from Artech Information Systems, Noida, India

[3] S. Mahmoudinezhad a, A. Rezania a, D.T. Cotfas b, P.A. Cotfas b, L.A. Rosendahl ,**Experimental and numerical investigation of hybrid concentrated photovoltaic e Thermoelectric module under low solar concentration by** of Department of Energy Technology, Aalborg University, Pontoppidanstræde 111, Aalborg, DK, 9220, Denmark

[4] Dr. S. Kumar and Dr. A.K Kapoor in year 2019 from DRDO, New Delhi Photonic Quantum Computing: Shor's Algorithm and the Road to Fault-Tolerance , B. P. Lanyon, T. J. Weinhold, N. K. Langford, M.
Barbieri, M. P. de Almeida, A. Gilchrist, D. F. V. James and A. G. White

[5] Moh'd A. Al-Nimr, Bourhan M. Tashtoush', Mohammad A. Khasawneh, Ibrahim Al-Keyyam of Mechanical Engineering, Jordan University of Science and Technology, Irbid, Jordan

Biography:

Devanshi Arora is currently pursuing B.Tech in Electronics and Communication from SRM IST,Chennai. Researcher in Optics and Photonics, Currently working in Quantum Computing using Various virtual simulators from IBM and Microsoft. Looking for full time work or research opportunities.

- **Full Name:** Devanshi Arora
- **Personal Email:** devanshiarora40@gmail.com
- **Mobile Number:** +91-8968413221
- **Category:** (Oral presentation)
- **LinkedIn Account:**
- **Date of Birth:** 02/02/1998
- **Postal Address:** #3221,23-D,160023,Chandigarh(U.T),India

Email: devanshiarora40@gmail.com