Dhananjay Kumar

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Professional Summary

A highly motivated researcher driven by the desire to elucidate the performance optimizations of a thermodynamic system. My dissertation primarily deals with the energy and exergy analysis of thermodynamic systems. In course of my PhD work, I developed a solar-biomass hybrid dryer coupled with thermal storage systems. The performance investigation of the dryer was performed with the help of energy-exergy methodology. I have a deep interest in the field of solar energy harvesting and thermal energy storage in particular.

Education

Ph. D.	**Mechanical Engineering**	**IIT Guwahati**	Jan 2016-Present
B. Tech	**Mechanical Engineering**	**MAKAUT, WB**	2010-2014 (CGPA: 8.21/10)

Thesis Supervisors: Prof. Pinakeswar Mahanta and Dr. Pankaj Kalita

(Date of Ph.D. Thesis Submission: 31-03-2022**)**

Research interest

Thermodynamics, Heat Transfer, Solar Energy, Thermal Energy Storage, Drying Technology

Teaching/Subject Interest

- Thermodynamics
- Heat Transfer
- Fluid Mechanics
- Air Conditioning and Refrigeration
- Internal Combustion Engine

Publications

1. **Kumar, D.,** Mahanta, P., Kalita, P., Energy and exergy analysis of a natural convection dryer with and without sensible heat storage medium, Journal of Energy Storage. 29 (2020). https://doi.org/10.1016/j.est.2020.10148. **(SCIE, Impact Factor: 6.58).**

2. **Kumar, D.,** Mahanta, P., Kalita, P., Performance analysis of a solar air heater modified with zig-zag shaped copper tubes using energy-exergy methodology, Sustainable Energy Technologies and Assessments. 46 (2021)101222. https://doi.org/10.1016/j.seta.2021.101222. **(SCIE, Impact Factor: 5.35).**

3. **Kumar, D.**, Mahanta, P., Kalita, P., 2022. Performance analysis of a novel biomass-fired

grain dryer integrated with thermal storage medium. Biosystems Engineering 216, 65–78. https://doi.org/10.1016/j.biosystemseng.2022.02.001. **(SCIE, Impact Factor: 4.12).**

4. **Kumar, D.,** Mahanta, P., Kalita, P., Performance analysis of natural convection biomass operated grain dryer coupled with latent heat storage medium, Materials Today: Proceedings. (2022). https://doi.org/10.1016/j.matpr.2021.12.045. **(Scopus).**

5. **Kumar, D.,** Mahanta, P., Kalita, P., 2022. Energy and exergy analysis of a forced convection solar dryer coupled with biomass operated dryer having thermal energy storage medium, Energy Sources, part A: Recovery, Utilization, and Environmental Effects (Under review). **(SCIE, Impact Factor: 3.44).**

6. **Kumar, D.**, Mahanta, P., Kalita, P., 2022. Performance analysis of a newly developed natural convection solar dryer for paddy drying process Biosystems Engineering (Under review), **(SCIE, Impact Factor: 4.12).**

7. **Kumar, D.,** Mahanta, P., Kalita, P., 2022. Reduction in energy and exergy losses in a biomass-fired grain dryer using a sensible thermal storage medium. Material Today: proceedings (Under review). **(Scopus).**

Book Chapters

1. **Kumar, D.,** Mahanta, P., Kalita, P., Thermodynamic analysis of a natural convection dryer, in: P.H. and B.N.H. Yengkhom Disco Singh, Helen Soibam (Ed.), Post Harvest Technology and Value Addition, Vol-1, Iss, The Dean, College of Horticulture & Forestry, Central Agricultural University, Pasighat-791102, Arunachal Pradesh., 2019: pp. 156–61. https://doi.org/ISBN 978-93-5396-087-2.

2. **Kumar, D.,** Mahanta, P., Kalita, P., Exergy analysis of a natural convection grain dryer, in: I. Dr. Satyender Singh (NIT Jalandhar (Ed.), Energy Storage Systems; An Introduction, Nova science publishers, 2020. https://doi.org/ISBN: 978-1-53618-910-0.

3. **Kumar, D.,** Mahanta, P., Kalita, P., Natural convection grain dryer, in: I. Dr. Satyender Singh (NIT Jalandhar (Ed.), Energy Storage Systems; An Introduction, Nova science publishers, 2020. https://doi.org/ISBN: 978-1-53618-910-0.

Conferences Attended

1. **Kumar, D.,** Mahanta, P., Kalita, P., 2020. 3rd International Conference on Recent Trends in Multidisciplinary Research. 26th–27th December 2020, Maldives.
2. **Kumar, D.,** Mahanta, P., Kalita, P., 2021. Non-dimensional numbers analysis of a Grain dryer. International Conference on Science Engineering and Technology. 27th-28th January 2021, Singapore.
3. **Kumar, D.,** Mahanta, P., Kalita, P., 2021. Performance analysis of natural convection biomass operated grain dryer coupled with the latent heat storage medium. International

Conference on Novel Materials for Biomedical, Energy, Environment, Sensing and other applications. 11th-13th March 2021, NIT Trichy, India.

4. **Kumar, D.,** Mahanta, P., Kalita, P., 2022. Reduction in energy and exergy losses in a biomass-fired grain dryer using a sensible thermal storage medium. Material Tech 2022, online Second International Conference on Materials and Technologies. 27th -29th January 2022, NIT Raipur, India.

Academic Achievement

- **Gate Qualified:** 2014 and 2015
- **Fellowship:** Ministry of Human Resource Development (MHRD), Govt. of India, Fellowship for Ph.D. Research.
- Member of the "**Indian Society of Heating Refrigeration and Air Conditioning Engineers (ISHRAE)"** for the Period of 26th March 2016 to 31st March 2017.

Workshop Attended

- Attended and actively participated in the GLOBAL INITIATIVE OF ACADEMIC NETWORKS (GIAN) course on **"Modelling and Simulation in Energy Storage"** during 3-9 January 2022 held at IIT Guwahati.
- Attended and actively participated in the GLOBAL INITIATIVE OF ACADEMIC NETWORKS (GIAN) course on **"Electricity systems and Future Scenarios"** during 6-11 November 2016 held at IIT Kharagpur.

References

Prof. Pinakeswar Mahanta

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Dr. Pankaj Kalita

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