



Kamalakanta Satpathy, Ph.D.

Designation : Senior Asst. Professor

Department : Department of Basic Science and Humanities
(JOINED THE INSTITUTE IN 2020)

Contact : +91 77357 84051 (Mobile)

Email : kamalakanta.satpathy@silicon.ac.in

RESEARCH INTERESTS

- Computational Fluid Dynamics
- Process optimization for drinking water applications
- Cryogenic cooling by Natural Convection
- Bluff body dynamics
- Multiphase flow analysis using the Discrete Phase Model
- Gas entrainment studies incorporating the volume of fluids approach
- Numerical modeling on the fluid flow and heat transfer analysis
- Measurement using the Acoustic Doppler Velocimetry
- Mathematical Modeling, Nuclear Engineering, CAD design.

Academic Qualifications

Post Doctoral Researcher: Faculty of Bio-Science Engineering, Ghent University, Belgium

Post Doctoral Researcher: Dept. of Electrical, Electronics and Computer Sciences, University of Liege, Belgium

Post-Doc Fellow/Project Scientist: Institute of Plasma Research, Gujarat

Ph. D. (Physics): Homi Bhabha National Institute (IGCAR Campus), Tamilnadu

M. Sc. (Physics): Ravenshaw University, Odisha

Teaching Experience/Industrial Experience/Research Experience

Teaching Experience: 1 year

Research Experience: 6 years (excluding PhD)

PUBLICATIONS

Journal & Conferences

- [1]. **K. Satpathy**, B. Cools, I. Nopens et al., Process analysis and optimization of a dissolved air flotation system using CFD, *Water Science & Technology*, 81 (8), 1668 - 1681, 2020.
- [2]. **K. Satpathy**, A. Duchesne, C. Dubois et al., Studies on buoyancy driven heat transport in silicon oils and liquid nitrogen in view of cooling applications, *Int. J. of Heat & Mass Transfer*, 118, 538 -550, 2018.
- [3]. **K. Satpathy**, A. Duchesne, C. Dubois et al., Studies on convective cooling of cryogenic fluids towards superconducting applications, *Computational Methods & Experimental Measurements*, 117, 95 – 106, 2017.
- [4]. S. Rimza, **K. Satpathy**, S. Khirwadkar, K. Velusamy, Optimal design of divertor heat sink with different geometric configurations of sectorial extended surfaces, *Fusion Engineering & Design*, 100, 581 – 595, 2015.
- [5]. S. Rimza, **K. Satpathy**, S. Khirwadkar, K. Velusamy, Numerical studies on helium cooled divertor finger mock up with sectorial extended surfaces, *Fusion Engineering & Design*, 89, 2647 – 2458, 2014.
- [6]. **K. Satpathy**, K. Velusamy, BSV Patnaik, P. Chellapandi, Numerical simulation of liquid fall induced gas entrainment and its mitigation, *Int. J. of Heat & Mass Transfer*, 60, 392 – 405, 2013.
- [7]. **K. Satpathy**, K. Velusamy, BSV. Patnaik, P. Chellapandi, Numerical investigation of vortex shedding past a finite cylinder mounted on a flat plate, *Numerical Heat Transfer-A*, 59(11), 882 – 909, 2011.
- [8]. **K. Satpathy**, K. Velusamy, P. Chellapandi, Computational fluid dynamics studies on gas entrainment in a fast breeder reactor, *Energy Procedia*, 7, 333 – 339, 2011.
- [9]. K. Velusamy, P. Chellapandi, **K. Satpathy et al.**, A fundamental approach to specify thermal and pressure loadings on containment buildings of sodium cooled fast reactors during a core disruptive accident, *Annals of Nuclear Energy*, 38, 2475 – 2487, 2011.

ANY OTHER

Conferences attended

- [1]. K. Satpathy, I. Nopens, J. Talukdar, Measurement campaign using the acoustic doppler velocimetry (ADV) in the dissolved air flotation system's, 48th National Conference on Fluid Mechanics and Fluid Power (FMFP), 27 – 29th Dec' 2021, BITS Pilani.
- [2]. K. Satpathy, B. Cools, L. Verdict et al., CFD-based process optimization of a dissolved air flotation system for drinking water production, 10th IWA Symposium Modeling and Integrated Assessment, 1 - 4th Sept' 2019, Copenhagen, Denmark.
- [3]. I. Nopens, J. Wicks, David F. del Pozo, Y. Amerlinck, K. Satpathy et al., Resource recovery and advanced CFD: a required marriage, 6th IWA/WEF Water Resource Recovery Modeling Seminar, 10 – 14th March 2018, Quebec, Canada.

- [4]. K. Satpathy, 16th Multiphase flow conference and short course, 14 – 17th Oct' 2017, Dresden, Germany.
- [5]. K. Satpathy, I. Nopens et al., Towards optimization of dissolved air flotation using computational fluid dynamics, IWA World Water Congress & Exhibition, 16 - 21st Sept' 2018, Tokyo, Japan.
- [6]. K. Satpathy, C. Dubois, A. Duchesne et al., Studies on convective cooling of cryogenic fluids towards superconducting applications, 11th Int. Conference on Advances in Fluid Mechanics, Wessex Institute, 05 – 7th Sept' 2016, Ancona, Italy.
- [7]. K. Satpathy, C. Dubois, J.F. Fagnard et al., Studies on cooling enhancement of cryogenic fluids for superconducting applications, 5th Int. Workshop on Numerical Modeling on High Temp. Superconductors, 15 – 17th June 2016, Bologna, Italy.
- [8]. K. Satpathy, 9th International Workshop on Processing and Applications of Superconducting Large Grain Materials, 2 - 4th Sept' 2015, Liège, Belgium.
- [9]. K. Satpathy, K. Velusamy, BSV Patnaik, Studies on gas entrainment due to vortex activation at free surface of fast breeder reactor, Int. Workshop on New Horizons in Nuclear Reactor Thermal Hydraulics & Safety, Mumbai, 14 - 15th Jan' 2014, India.
- [10]. S. Khirwadkar, S. Rimza, K. Satpathy et al., Demo divertor readiness gaps and needed R&D, 1st IAEA-DEMO Program Workshop, 15 – 18th Oct' 2012, Los Angeles, US.
- [11]. K. Satpathy, Indo-European meeting on Instabilities in Shear Flows, Jan' 2011, JNC-SAR, Bangalore.
- [12]. K. Satpathy, K. Velusamy, B.S.V. Patnaik et al., (2011) Investigation of argon gas entrainment in liquid sodium at free surface during cross flow over cylindrical components, IUTAM Symposium on Bluff Body Flows, 12 – 16th Dec 2011, IIT-Kanpur.
- [13]. K. Satpathy, K. Velusamy, B.S.V. Patnaik et al., (2010) CFD simulation of gas entrainment in a liquid pool by VOF method, 4th Int. Conf. on Fluid Mechanics & Fluid Power, IIT-Madras, 16 – 18th Dec' 2010, Chennai.
- [14]. K. Satpathy, K. Velusamy, P. Chellapandi, Computational Fluid Dynamic Studies on Gas Entrainment in Fast Breeder Reactors, Asian Nuclear Prospects, 10 – 13th Oct' 2010, Mamallapuram, Tamilnadu.
- [15]. K. Satpathy, K. Velusamy, P. Chellapandi, Condensation behavior of fuel vapor in sub-cooled sodium during severe accident condition, Int. Conf. on Simulation and Modeling, 27 – 29th Aug' 2019, CIT Coimbatore, TN.

Industrial Reports:

- [1]. K. Satpathy, S. Balemans, I. Nopens, Measurement campaign using the acoustic doppler velocimetry (ADV) in the DAF utilities, Report submitted to the De Watergroep (Belgium) and KWR (Netherlands).
- [2]. K. Satpathy, I. Nopens et al., CFD study of a water reservoir basement, Report submitted to the De Watergroep and KWR.

Internal Reports:

- [1]. K. Satpathy, Process optimization of dissolved air flotation systems, R²T (Resource Recovery Technology Consortium) Newsletter, Ghent University, Jan' 2019.
- [2]. K. Satpathy, S. Khirwadkar, Numerical studies on HHF test mono-block for divertor applications, Technical Report (TR- IPR)/253, 2015.
- [3]. K. Satpathy, S. Khirwadkar, Benchmarking using STAR CCM+, TR-IPR/246, 2013.
- [4]. K. Satpathy et al., Effect of manufacturing deviation in inner vessel on hot pool thermal hydraulics, Design Note (DN – IGCAR)/1013, 2011.
- [5]. K. Satpathy, K velusamy, P. Chellapandi, Condensation time and migration height of core bubble in primary sodium during a CDA, DN/1004, 2011.
- [6]. K. Satpathy et al., Benchmarking of OpenFOAM based CFD tool: Study-1, Numerical simulation of flow around bluff bodies, DN/1106, 2010.
- [7]. K. Satpathy et al., Benchmarking of OpenFOAM based CFD tool: Study-2, Forced convection heat transfer in external flow, DN/1110, 2010.

Grants and Honors:

EMADES Postdoc Fellowship, University of Beira Interior, Portugal, June' 2019.

Membership:

- Applied Fluid Mechanics (UK)
- Belgian Water Associations (BIWA-IWA)
- Indian Nuclear Society (INS, Mumbai)

Reviewer

Journal of Water Science and Technology
Engineering Applications on CFD
Journal of Nuclear Science and Technology

Training

Multiple trainings on the CFD and Mathematical Modelling Softwares,
CAD Designs & Refresher Courses.

Student guidance:

M. Tech: Rajasekhar Reddy, IIT-Madras, Chennai (Co – Supervisor, Cont.)
M.S.: Md. Kashan, IIT-Madras, Chennai (Co – Supervisor, Cont.)
PhD: Sandeep Rimza, Institute of Plasma Research, Gujarat (Co – Supervisor)
M. Tech: B. Hanuma Reddy, IIT-Madras, Chennai (Co – Supervisor)
B. Tech: V. Leela Vinodhan, Sastra University, Tamilnadu (Co – Supervisor)