

FACULTY PROFILE



NAME : E.NATARAJAN
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1. Qualification & Experience

Qualification:

Course	Specialisation	Institution	Year of Completion
UG	B.E. (Mechanical Engg.) (Gold Medal.) (University First Rank)	VIT, Vellore (Madras University)	1988
PG	M.Tech (Combustion and Propulsion.)	IIT Chennai - 600 036	1990
Ph.D	Ph.D (Renewable Energy.)	Anna University Chennai-600 025	1998

Experience:

a) Teaching:

S1.No	University/College	Designation	Period
1	Anna University Chennai-600 025	Prof in Dept. of Mech. Engg.	March 2007 – Till date
2	Anna University Chennai-600 025	Asst Prof in Dept. of Mech. Engg.	March 1999 – March 2007
3	Anna University Chennai-600 025	Senior Lecturer Dept. of Mech. Engg.	May 1998 – March 1999

4	Anna University Chennai-600 025	Lecturer in Dept. of Mech. Engg.	Dec 1992 – May 1998
5	SRM Engineering College Kattankulathur-603 203	Lecturer Dept of Mech. Engg.	July 1990 – Dec 1992
6	Vellore Engg. College Vellore-632 014	Lecturer Dept of Mech. Engg.	Jan 1990 – July 1990

2. Research

1. Research Area : Biomass Gasification & Pyrolysis
Solar PV System Design and Optimization
Solar Thermal – PV Systems
Energy Efficient Buildings
Heat Exchangers and Power Plants

2. Research Guidance :

2.1. Ph.D – No. of students guided /guiding :

Sl. No.	Name	Title	Year of Award	Status
1	Shanmugam, V.	Studies on the Solar Dryer with Desiccant Bed and Reflective Mirror	2007	Completed
2	Narayanan, K.V.	Experimental Investigations on the Co-Firing of Coal and Biomass in A 18.68 MW Power Plant	2007	Completed
3	Rajendra Prasad, A.	Techno-Economic Optimization of Solar PV-Wind Hybrid System for Rural Electrification	2008	Completed
4	Ganapathy Subramanian, L.R.	Modeling and Analysis of Point Source Emission in Manali, Chennai	2008	Completed
5	Pitchandi, K.	Studies on Entropy Generation For the Design of Heat Exchangers	2009	Completed
6	Ganapathy Sundaram, E.	Biomass Pyrolysis	2010	Completed
7	Kannan, M.	Experimental studies on heat transport capability of two phase thermosyphon	2011	Completed

8	Baskara Sethupathy, S.	Biomass Gasification in Fluid Bed Gasifiers	2012	Completed
9	Sivakumar, K.	Computational and experimental investigations in rectangular convergent and divergent ribbed channels	2015	Completed
10	Rekha, L.	Modelling and experimental studies on energy and exergy of solar hybrid photovoltaic thermal systems	2015	Completed
11	Anin Vincely, D.	Role of Nanofluids in Heat Exchangers	-	Submitted
12	Madasamy, P.	Flow Accelerated Corrosion	2015	Completed
13	Dilli babu. V	Thermo-chemical conversion of lignite	-	In progress
14	Eswari thai	Chemical looping Combustion	-	In progress
15	Prakash. M	Effect of various basin materials on the thermal performance of solar stills	-	Submitted
16	Dhass. A.D	Losses in solar photo voltaic system	-	In progress
17	B Srimanickam	Exergy analysis of solar photovoltaic (PV/T) hybrid system	-	In progress
18	Revathy D	PVT Systems	-	In progress
19	Bikash Kumar Mondal	Computational and experimental analysis of turbine blade cooling process	-	In progress
20	R. Senthil kumar	Modelling and Simulation of Solar PV/T Hybrid Systems	-	In progress
21	R.Geetha	Energy analysis of BIPV/T	-	In progress

2.2. M.S - No. of students guided / guiding:

Sl. No.	Name	Title	Year of Award	Status
1	Madasamy, P.	Flow accelerated Corrosion	2006	Completed
2	Abeenash. V.N	Generation of Hydrogen Rich Gas Through Thermochemical Conversion	2015	Completed

		of Biomass		
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3. Journals

a) Select List in International Journal (s):

1. Srimanickam, B, Vijayalakshmi, MM & Natarajan, E 2017, 'Energy and exergy efficiency of flat plate PVT collector with forced convection', Journal of Testing and Evaluation, vol. 46, no. 2, pp. 1-15.
2. Srimanickam, B, Vijayalakshmi, MM & Natarajan, E 2015, Experimental performance assessment of single glazing flat plate solar photovoltaic thermal (PV/T) hybrid system. Progress in Industrial Ecology, an International Journal, vol. 9, no. 2, pp. 111-120.
3. Srimanickam, B, Vijayalakshmi, MM & Natarajan, E 2015, 'Experimental Study of Exergy Analysis on Flat Plate Solar Photovoltaic Thermal (PV/T) Hybrid System', Applied Mechanics and Materials (vol. 787, pp. 82-87). Trans Tech Publications.
4. **Prakash, M. and Natarajan, E.** "Productivity enhancement of a single basin and single slope solar still coupled with various basin materials" DOI: 10.1080/19443994.2014.1003973, Desalination and Water Treatment, 2015, pp.1-16.
5. **Prakash, M. and Natarajan, E.** "Performance and economic evaluation of a single basin and single slope solar still". International Journal of Emerging Technology in Computer Science & Electronics (IJETCSE), Vol. 12, 2015, pp.141-144.
6. **Prakash, M. and Natarajan, E.** "Review on the productivity of various single basin and single slope solar still", DOI: 10.1080/19443994.2014.909329, Desalination and Water Treatment, 2014, pp.1-12.
7. **Prakash, M. and Natarajan, E.** "Design, Fabrication and Performance Analysis of Single Basin Solar Stills". Applied Mechanics and Materials Vol. 372, 2013, pp.590-593.
8. **Rekha, L., Vijayalakshmi, M M. and Natarajan, E.** 2013 "Comparative analysis of single and multi duct air cooling in photovoltaic thermal hybrid system" International journal of engineering and technology, ISSN: 0975-4024, Vol.5, no.6, pp.5002-5010.
9. **Rekha, L., Vijayalakshmi, M M. and Natarajan E.** "Analysis of PVT hybrid system based on entropy generation for hot and humid climate of Chennai", Energy for sustainable development, ESD-S-14-0081. Communicated.
10. **Rekha, L., Vijayalakshmi, M M. and Natarajan E.** "Photovoltaic thermal hybrid solar system for residential applications" International Journal of Research in Engineering and technology, IJRET-e SAT publishers, ISSN:2319-1163| pISSN: 2321, Vol.2, Issue: 10, pp.277-283.
11. **Abeenash.V.N and Natarajan.E** "Parametric Analysis of Hydrogen-rich Gas from Sawdust Gasification" International Energy Journal (IEJ), Volume 14, Issue 2 (June 2014).
12. **Madasamy P., Natarajan E., Subramanian H., Krishna Mohan T. V., Velmurugan S., and, Narasimhan S.V.** "Experimental determination of the rate of flow accelerated corrosion of bend and straight section of carbon steel feeder pipes of primary coolant system of PHWRs" Corrosion Engineering, Science and Technology, March 2010.

13. **Madasamy P., Natarajan E., Krishna Mohan T.V., Andrews Sylvanus, and Velmurugan S.**, “A study on hydrodynamic effects of flow accelerated corrosion under low temperature and neutral pH conditions” *Annals of Nuclear Energy* (Communicated).
14. **Dhass A.D, Natarajan E., and Lakshmi P.** “An investigation of temperature effects on solar photovoltaic cells and modules”. *International Journal of Engineering, IJE TRANSACTIONS B: Applications* Vol. 27, No. 11, 2014 1713-1722.
15. **Dhass A.D, Natarajan E., and Lakshmi P** “Influence of Shunt resistance on the performance of solar photovoltaic cell” in the international conference on Emerging Trends in Electrical Engineering and Energy Management (ICETEEM)_DOI: 10.1109/ICETEEM.2012.6494522, Publication Year: 2012, Page(s): 382 - 386, published in **IEEE Digital Xplore**.
16. **Deepak Kumar M , Dr. E. Natarajan** Modelling and economic analysis of an improved duplex solar still, *Applied Mechanics and Materials* Vols. 592-594 (2014) pp 2386-2390.
17. **Sivakumar, K, Natarajan, E & Kulasekharan, N** 2014, ‘Experimental Study of Developing Turbulent Flow and Heat Transfer in Ribbed Convergent / Divergent Rectangular Ducts’, *Thermal Science*, (Accepted for publication), (Impact factor : 1.45).
18. **Sivakumar, K, Natarajan, E and Kulasekharan, N** 2014, ‘Experimental Studies on Turbulent Flow in Ribbed Rectangular Convergent Ducts with Different Rib Sizes’, *International Journal of Heat and Technology*’, vol.32, no.1,pp 79-85.
19. **Sivakumar, K, Natarajan, E and Kulasekharan, N** 2014, ‘Heat transfer and pressure drop comparison between smooth and different sized rib – roughened divergent rectangular ducts’, *International journal of Engineering and Technology*, vol.6, no.1, pp. 263-272.
20. **Sivakumar.K, Dr. E. Natarajan and Dr.N Kulasekheran** (2014) Design Optimization of Rib-Roughened Convergent / Divergent Channel to Enhance Turbulent Heat Transfer’, *International Journal of Innovative Research in Science, Engineering and Technology*, Vol. 3. SI 1, pp- 7 -12.
21. **Sivakumar.K, Dr. E. Natarajan and Dr.N .Kulasekheran** (2013) Influence of Rib Height on Heat Transfer Augmentation – Application to Aircraft Turbines, *International Journal of Turbo Jet Engines*, DOI:10.1515/tjj2013-0035.
22. **Sivakumar.K, Dr.E.Natarajan and Dr.N.Kulasekheran** (2013) CFD Simulation and Experimental Investigation of Convection Heat Transfer in a Rectangular Convergent Channel with Staggered Ribs, *International Review of Mechanical Engineering (I.R.E.M.E)*.
23. **Sivakumar.K, Dr.E.Natarajan and Dr.N.Kulasekharan** (2013) Paper selected for the topic of “**Influence of Different rib height on Heat Transfer Augmentation in Rectangular Convergent /Divergent Channels with continuous ribs on bottom surface**”, *ASME Digital Library*, Paper No. GTINDIA2013-3570, pp. V001to2A007, DOI. 10.1115/GTINDIA 2013-3570.
24. **Sivakumar.K, Dr. E.Natarajan and Dr.N.Kulasekharan** (2012) Comparative study between experimental work and CFD analysis in a square convergent ribbed duct,. *Lecturer Notes in Mechanical Engineering*, Springer India 2012. DOI: 10.1007/978-81-322-1007-8_41.pp 447 -457.
25. **Sivakumar.K, Dr. E.Natarajan and Dr.N.Kulasekharan** (2012) Numerical study of turbulent flow and heat transfer in square convergent channel with 90° inline rib

turbulators. International Journal of Engineering and Innovative Technology. Vol.1. (3). Pp. 218-224

26. **Sivakumar,K, Dr. E.Natarajan and Dr.N.Kulasekharan** (2012) Gas turbine blade cooling at mid chord region by using rib turbulators – a review. Journal of Mechanical Engineering (Strojnický časopis). Vol.63 (1). pp. 1-16.
27. **Baskara sethupathy,S. and Natarajan, E.** (2012), “Hydrodynamic study on gasification of biomass in a fluidized bed gasifier”, International Journal of Engineering Science and Technology, Vol. 4, No.1, pp.316-323.
28. **Baskara sethupathy, S. Chokalingam, V. and Natarajan, E.** (2012), “An experimental exploration of the biomass gasification in a fluidized bed”, International Journal of Renewable and Sustainable Energy, Vol.4,No.043113, pp.1-8.
29. **Rekha L., Vijayalakshmi M M and Natarajan E.** “Photovoltaic Thermal Hybrid Solar System for Residential Applications”. Journal Energy Sources, Part A: Recovery, Utilization, and Environmental Effects - Decision on Manuscript ID UESO-2011-1265.(2012) R1(accepted for publication.)
30. **Kannan M, Natarajan E. (2010).** “Thermal Performance of a Two-Phase Thermosyphon for waste heat recovery system”, Journal of Applied Sciences, 10 (5) – 413 – 418.
31. **Natarajan E and Ganapathy Sundaram E. (2009),** “Pyrolysis of Rice Husk in a Fixed Bed Reactor”, World Academy of Science, Engineering and Technology, 56 (504 – 508).
32. **Pitchandi, K. and Natarajan, E. (2008),** “Entropy Generation in regenerative heat exchanger due to finite temperature difference”, Int. J of Thermodynamics, Vol. 11. No. (4), pp.173-179.
33. **Pitchandi, K. and Natarajan, E. (2008),** “Entropy Generation in pin fins of circular and elliptical cross sections in Forced Convection with Air, heat exchanger due to finite temperature difference”, Int. J of Thermodynamics, Vol. 11 . No. (4), pp.161-171.
34. **Ganapathy Sundaram, E and Natarajan E. (2008).** “Pyrolysis of Coconut Shell: An Experimental Investigation”, The Journal of Engineering Research, (Accepted for Publication in June, 2009)
35. **Ganapathy Sundaram, E and Natarajan E. (2008).** “Experimental Investigation On The Effect Of Particle Size And Heating Rate On The Slow Pyrolysis Of Agricultural Residues”, International Journal for Engineering Research and Industrial Applications, Vol. I, Issue VII, pp. 241 – 254.
36. **Narayanan, K.V. and Natarajan, E. (2007).** “Experimental studies on cofiring of coal and biomass blends in India”, Renewable Energy, Volume 32, Issue 15, Pages 2461-2642.
37. **Sivakumar,S, Pitchandi, K. and Natarajan, E. (2008).** “Modeling and Simulation of Downdraft Wood Gasifier”, International Journal of Applied Science, 8 (2) : 271 – 279..
38. **Sivakumar, S, Pitchandi, K and Natarajan, E.(2007).**“Comparative Analysis of Biomass Gasifier”, Asian Journal of Microbiology, Biotechnology and Environmental Sciences, Vol. 9, No. 4, pp. 1023 – 1028.
39. **Shanmugam, V and Natarajan, E. (2007).** “Experimental study of regenerative desiccant integrated solar dryer with and without reflective mirror”, Applied Thermal Engineering, Vol. 27,pp.1543- 1551.

40. **Vijayalakshmi, M.M., Natarajan, E. and Shanmugasundaram, V. (2006).** “Thermal behaviour of building wall elements”, International Journal of Applied Sciences, ANSINET publishing, Vol.6 (15), pp.3128-3133.
41. **Narayanan, K.V. and Natarajan, E. (2006).** “ANN Model for emissions from Co-firing of coal and biomass in a travelling grate boiler in India”, Journal of Engineering and Applied Sciences, Medwell Online Publishing, Vol. 4, pp. 355 – 359.
42. **Narayanan, K.V. and Natarajan, E. (2006).** “Co-firing of coal and biomass in a travelling grate boiler in India”, Journal of Applied Sciences, 6 (9), 1924-1928.
43. **Rajendra Prasad A. and Natarajan, E. (2006).** “Optimization of integrated PV-wind power generation systems with battery storage”, Energy Vol.31, pp. 1607-1618.
44. **Ganapathy Subramanian, L.R. and Natarajan, E. (2006).** “Modelling of SO₂ Emission from point sources in Manali Region of Madras, India”, International Journal of Applied Sciences, ANSINET publishing, Vol.6 (15), pp.3035-3043.
45. **Narayanan, K.V. and Natarajan, E. (2006).** “Co-firing of coal and biomass in a traveling grate boiler”, International Journal of Applied Sciences, Vol.6, No.9, pp. 1924-1928.
46. **Narayanan, K.V. and Natarajan., E. (2006).** , “Tests on co-firing of coal and biomass in a traveling grate boiler”, Indian Journal of Power and River Valley Development, vol.55, Issue 10&11, pp. 227 – 232.
47. **Shanmugam V. and Natarajan E. (2005),** “Experimental investigation of forced convection and desiccant integrated solar dryer”, Renewable Energy, Vol,31(8), pp.1239-1251.
48. **Natarajan, E., Nordin, A. and Rao, A.N. (1998),** “Overview of Combustion and Gasification of Rice Husk in Fluidized Bed Reactors”, International Journal of Biomass and Bioenergy, Vol.14, Nos. 5/6, pp.533-546.
49. **Natarajan, E., Oman, M., Gabra, M., Nordin, A., Liliedahl, T. and Rao, A.N., and Rao, A.N. (1998),** “Experimental Determination of Bed Agglomeration Tendencies of Some Common Agricultural Residues in Fluidized Bed Combustion and Gasification”, International Journal of Biomass and Bioenergy, Vol.15, No.2, pp.163-169.

b) Select List in National Journal (s)

1. Srimanickam, B, Vijayalakshmi, MM & Natarajan, E 2015, ‘Thermal Analysis on Photovoltaic Thermal Hybrid System with Cooling Channel with V-Baffles’, Indian Journal of Science and Technology, vol. 8, no. 36. (ANNEXURE: II).
- 2.
3. **Revati D and E. Natarajan,** Enhancing the Efficiency of Solar Cell by Air Cooling, Indian Journal of Science and Technology, Vol 9(5), DOI: 10.17485/ijst/2016/v9i5/87274, February 2016
4. **Prakash .M and Natarajan. (2014)** “Solar still integrated with porous material Journal of Chemical and Pharmaceutical Sciences”, JCHPS Special Issue 4: December 2014, Article 73, pp.215-217

5. **Prakash .M and Natarajan.** (2014) “Rain device with step wise basin enhanced condensation performance evaluation”, Journal of Chemical and Pharmaceutical Sciences, JCHPS Special Issue 4: December 2014, Article 82, pp.215-217.
6. **Baskara Sethupathy, S and Natarajan, E.** (2012) “An Experimental investigation on sawdust gasification in a fluidized bed”, Indian Journal of Research, Vol. 1, No.2, pp.68-70
7. **Rekha, L. and Natarajan, E.** “Role of Energy Labels in Energy Efficiency”, National Journal of Engineering and Management., Vol. 2, January – June 2010
8. **Narayanan, K.V., and Natarajan.E,** “Tests on co-firing of coal and biomass in a travelling grate boiler”, Indian Journal of Power and River Valley Development, vol.55, Issue 10&11, pp.227 - 232.
9. **Sivakumar, S. and Natarajan, E. (2007),** Modelling and Simulation of Downdraft Biomass Gasifier”, National Journal of Engineering, Periyar Maniammai College of Technology for Women, Thanjavur.
10. **Sivakumar, S., Pitchandi, K. and Natarajan, E. (2007),** ‘Thermal Gasification Behaviour of Biomass – A Study’, National Journal of Engineering Today, August 2006, pp.31-34.
11. **Sivakumar.S., Pitchandi.K, and Natarajan.E. (2000)** “Analysis of Downdraft Biomass Gasifier Using CFD”, National Journal of Engineering Today, August 2006, pp.6-9.

c) Select List in International Conference (s):

1. **Prakash .M and Natarajan.** Comparative performance analysis of a solar still integrated with PCM material. icet2k15, Nagercoil, 26th– 27th MARCH, 2015
2. **Prakash .M and Natarajan. E.** “Reduction of heat loss in single basin and single slope solar still experiment”. ICEM-2014, July 28-30 2014, Sathyabama University, Chennai.
3. **Prakash .M and Natarajan. E.** “Design and development of a low cost single basin and single slope solar still”, ICEM-2014, July 28-30 2014, Sathyabama University, Chennai.
4. **Prakash .M and Natarajan. E.** “Asymmetrical solar still coupled with pond” Applied Mechanics and Materials, ISERMAT – 153, January 08 - 09, 2015, SSN College of Engineering, Chennai.
5. **Prakash .M and Natarajan. E.** An experimental investigation on the effect of temperature in basin surface of the solar still. Proceeding of the EEAOTEES-2014, 29th- 30th September 2014, Anna University, Chennai.
6. **Prakash .M and Natarajan. E.** “Thermal performance of solar still integrated with helical copper coil” in the in “International Conference on Environmental Management and Green Technologies St.Peter’s College of Engineering and Technology held during March 19-21, 2014.
7. **Prakash .M and Natarajan. E.** Solar Application in Desalination: Asymmetrical solar still Proceeding of the ICGTEPC -2014 27th- 29th September 2014, National Institute of Technology, Tiruchirappalli, India.

8. **Prakash .M and Natarajan. E.** Productivity improvement: Solar still operated with wick material Proceeding of the ICGTEPC-2014 27th- 29th September 2014, National Institute of Technology, Tiruchirappalli, India.
9. **Prakash .M and Natarajan. E** Productivity enhancement: Rain Machine (solar still) “Energy and Environmental Engineering” (ICEEE’14) from 6th & 7th November 2014.
10. **Prakash .M and Natarajan. E.** Augmentation of yield in solar stills by integrated with fins. ICP 2015, Feb 18-20, Anna University, Chennai.
11. **Prakash .M and Natarajan.** Solar Application in Desalination: Single Basin and Single Slope Solar Still Experiment, WREC, August 4-9, 2014.
12. **Prakash .M and Natarajan. E.** "Resources Flows and Reduction Potential at IITM Hospital” Indo-German Centre for Sustainability at Indian Institute of Technology Madras (IITM) Chennai. 24th February to 10th March 2013.
13. **Srimanickam, B, Vijayalakshmi.M.M and Natarajan.E.** “Experimental study of exergy analysis on flat plate solar photovoltaic thermal (PV/T) hybrid system”, the “International Conference on Sustainable Energy Resources, Materials & Technologies (ISERMAT – 2015)”, S S N College of Engg, Chennai, India, pp.27, 2015.
14. **Srimanickam, B, Natarajan.E.** “Experimental and CFD validation on energy and exergy analysis for different pattern of air flow in PV/T hybrid system with forced convection” the “International Conference on Polygeneration (ICP 2015)”, ANNA UNIVERSITY, Chennai, India, pp.75,2015.
15. **Abeenash V N and Natarajan E** “Paramdynamic Analysis of Hydrogen Rich Gas by Thermochemical Gasification of Sawdust”. National Conference on Emerging Trends in Mechanical Engineering, Valliammai Engineering College.
16. **Abeenash V N and Natarjan E** “Thermochemical Conversion of Rice husk for hydrogen production” National Conference on Advancement in Mechanical Engineering, Sree Sastha College of Engineering.
17. **Rekha, L., Vijayalakshmi, M M. and Natarajan, E.** 2011, “Parametric and exergy analysis of domestic solar water heating system”, International conference on mathematical modelling and application to industrial problem (MMIP 2011),NIT, Calicut,pp-47.
18. **Rekha, L., Vijayalakshmi, M M. and Natarajan, E.** 2011, “Photovoltaic thermal solar water heater for domestic application in chennai” International conference on ISHMT at IIT, ISHMT_IND_17_043,pp 1643-1650.
19. **Rekha, L., Vijayalakshmi, M M. and Natarajan, E.** 2013 “Green house saving potential of a photovoltaic thermal hybrid solar system for residential applications” Proceedings of International conference energy and environment, ICEE 2013,RIT Kottayam, Kerala, India.

20. **Rekha, L., Puja Priyadharshini, N Vijayalakshmi, M M. and Natarajan, E.** 2013 “Green house saving potential of a photovoltaic thermal hybrid solar system for residential applications” International conference on green technology in Engineering And applied science – (ICGTEAS” 2013) Adhiparasakhati Engineering college.Melmaruvathur, Chennai, pp 86-91.
21. **Anin Vincely and Natarajan. E.** “Experimental performance analysis of flat plate thermosyphon solar water heaters with copper oxide nanofluids” presented a paper in the “International Conference on Environmental Management and Green Technologies St.Peter’s College of Engineering and Technology held during March 19-21, 2014.
22. **Madasamy P, Andrews Sylvanus R ,Krishnamohan T V, Velmurugan S and Natarajan E** “Design of a Stirred Reactor for FAC studies based on CFD modeling” E International Conference on Mathematical Modeling For Industrial Problems March 28-31, 2011 , NIT, Calicut, Kerala, India.
23. **Madasamy P, Andrews Sylvanus R ,Krishnamohan T V, Velmurugan S and Natarajan E** “A study on hydrodynamic effects of flow accelerated corrosion under low temperature conditions” International conference on Corrosion prevention for research Scholars CORYSM2013 February 28 - March 02, 2013 ,Chennai, India.
24. **P.Madasamy, M.Mukunthan,P.Chandramohan, T.V.Krishna Mohan, Andrews Sylvanus, E.Natarajan** “Influence of geometrical factors on flow accelerated corrosion ,A Study under neutral pH conditions” **International conference on Corrosion prevention for research Scholars CORYSM2014** Organised By NACE Gateway India , International Section, February 20-21. 2014,MUMBAI,India.
25. **Dillibabu .V and Natarajan. E.** “Overview of fluidised bed combustion system”. International Conference on Green Technologies for Environmental Pollution Control and Prevention, National Institute of Technology (NIT Trichy), September 27-29, 2014.
26. **Srimanickam, B. and Natarajan, E.** “Performance analysis of PV/Thermal Hybrid system”, the “International conference on Environmental Management and Green Technologies (ICEMGT 2014)”, St. Peter’s College of Engineering and Technology, Chennai, India, pp.294-298, 2014.
27. **Srimanickam, B. and Natarajan, E.** “Experimental Performance Analysis of Flat Plate Solar Photovoltaic Thermal (PV/T) Hybrid System” , the “International Conference on Green Technology for Environmental Pollution Prevention and Control (ICGTEPC 2014)”, NATIONAL INSTITUTE OF TECHNOLOGY, TRICHY, INDIA, pp.77, 2014.
28. **Deepak Kumar. M and Natarajan. E,** “Transient Analysis of various parameters affecting the productivity of a meliorated duplex solar still”, International Conference on Green Technologies for Environmental Pollution Control & Prevention, NIT Tiruchirappalli, September 27, 2014.
29. **Sivakumar.K, Dr. E. Natarajan and Dr.N .Kulasekheran** (2014) Design Optimization of Rib-Roughened Convergent / Divergent Channel to Enhance Turbulent Heat Transfer’, for 2nd International Conference on Emerging Trends in Energy and Environment, held on 9th and 10th January, 2014. Organized by Department of Mechanical Engineering, Sri Sai Ram Engineering College, Chennai, Tamil Nadu, India.

30. **Senthil Kumar .R and Natarajan .E** "Analysis of temperature and flow distribution in a flat plate PV/T hybrid system using Computational Fluid Dynamics (CFD) technique" in the International Conference on Green Technology for Environmental Pollution Prevention and control" 27th -29th September 2014, National Institute of Technology Tiruchirappalli (NIIT), India.
31. **Sivakumar.K, Dr.E.Natarajan and Dr.N.Kulasekharan** (2013) "**Influence of Different rib height on Heat Transfer Augmentation in Rectangular Convergent /Divergent Channels with continuous ribs on bottom surface**", in The ASME 2013 Gas Turbine Conference (GTINDIA 2013), Collection of technical papers ASME – December 5-6, 2013, Bangalore, Karnataka, India.
32. **Sivakumar.K, Dr. E.Natarajan and Dr.N.Kulasekharan** (2012) "**Experimental Studies On Developing Turbulent Flow And Heat Transfer In Ribbed Convergent Rectangular Ducts With Two Different Sized Ribs**" for the International Conference on Green Technology in Engineering and Applied Sciences, held on 29th and 30th March 2013, organized by Department of Mechanical Engineering, Adhiparasakthi Engineering College, Melmaruvathur, Tamil Nadu.
33. **Sivakumar.K, Dr. E.Natarajan and Dr.N.Kulasekharan** (2012) "**Comparative study between experimental work and CFD analysis in a square convergent ribbed duct** ", for the International National conference on emerging trends in science, engineering and technology, held on 13th and 14th December 2012, organized by Department of Mechanical Engineering, J.J. College of Engineering and Technology, Trichy.
34. **Sivakumar.K, Dr. E.Natarajan and Dr.N.Kulasekharan** (2013) "Experimental Study of Transient Forced Convection Heat Transfer from Convergent channel with various Rib Promoters" for the National Conference on advanced in Mechanical Science (AIMS – '13), held on 2nd march, 2013, and organized by Department of Mechanical Engineering, C.Abdul Hakeem College of Engineering and Technology, Melvisharam. Vellore Dt. Tamil Nadu.
35. **Sivakumar.K, Dr. E.Natarajan and Dr.N.Kulasekharan** (2012) "Thermal Characterization of Turbulent Flow in Orthogonal Ribbed Square Duct", for the National conference on Recent Development in Mechanical Engineering (NCRDMK-2K12), held on 28th March 2012, organized by Department of Mechanical Engineering, Thankavelu Engineering College. Chennai.
36. **Sivakumar.K, Dr. E.Natarajan and Dr.N.Kulasekharan** (2012) "**Numerical Study of Turbulent Flow and Heat Transfer in Square Convergent Duct**" for the National conference on Emerging Research and Advances in Mechanical Sciences (ERA-2012), held on 23th March 2012, organized by Department of Mechanical Engineering, Velammal Engineering College. Chennai.
37. **Nivas, V. E.Natarajan**, 'Simuation analysis of shadow factor and study of net cost per unit in the booster mirror arrangement for a solar panel and its impact on environment', ICST 2013, 3 – 5 Jan 2013, VelTech, Ch 62, pp.406 – 410.
38. **Baskara Sethupathy S., and Natarajan,E.** (2012), Generation of Hydrogen rich gas from saw dust using Fluidized bed gasification, the ASME International Mechanical Engineering Congress & Exposition (IMECE12), Houston, Texas, Nov. 9-15, 2012.
39. **Baskara Sethupathy,S. and Natarajan,E.** (2012), "steam gasification of coconut shell in a fluidized bed", the "International Conference on Energy Security, Global Warming and

Sustainable Climate, SOLARIS 2012". The conference is jointly organized by IIT Delhi (Full paper submitted).

40. **Rekha, L., E. Natarajan and M M Vijayalakshmi.** "Parametric and exergy analysis of domestic solar water heating system". International conference on Mathematical modeling and applications to industrial problems (MMIP 2011), NIT ,Calicut ,28-31 March 2011.
41. **Natarajan,E., Baskara Sethupathy,S. and Karthick, M.** (2009), "Fluidized bed gasification of rice husk for power generation". Proceedings of the International Conference on Energy and Environment(ICEE 2009) by World Academy of Science, Engineering and Technology (WASET), December 18-20, 2010, Singapore, Vol.56, pp.225-231.
42. **Baskara Sethupathy,S. and Natarajan,E.** (2009), "CFD simulation of two phase cold flow fluidized beds", Proc. of the International Conference on Latest trends in simulation modeling and analysis (COSMA 2009), National Institute of Technology (NIT), Calicut, Kerala, India, pp. 417-421
43. **Natarajan, E and Ganapathy Sundaram, E.,** "Pyrolysis of Rice Husk In A Fixed Bed Reactor", International Conference on Energy and Environment – ICEE 2009, Conducted by World Academic of Science Engineering and Technology (WASET) at River View Hotel, Singapore, 382 Havelock Road Singapore 169629, during 26 -28th Aug, 2009, Vol.56, pp.353 – 358.
44. **Natarajan, E and Pitchandi, K.,** "Thermodynamic optimization of Periodic Regenerative Heat Exchanger", International Conference on Energy and Environment – ICEE 2009, Conducted by World Academic of Science Engineering and Technology (WASET) at River View Hotel, Singapore, 382 Havelock Road Singapore 169629, during 26 -28th Aug, 2009, Vol.56, pp.359 - 368.
45. **Natarajan, E, Baskara Sethupathy, S and Karthick M.,** " Fluidized Bed Gasification of Rice Husk for power generagtion", International Conference on Energy and Environment – ICEE 2009, Conducted by World Academic of Science Engineering and Technology (WASET) at River View Hotel, Singapore, 382 Havelock Road Singapore 169629, during 26 -28th Aug, 2009, Vol.56, pp.225 - 231.
46. **Ganapathy Sundaram, E and Natarajan E.** (2008), "Experimental Investigation on Pyrolysis of Saw Dust in a Fixed Bed Reactor", Renewable Energy and Environment for Sustainable Development, Edited by Vijay, V.K. and Garg, H.P., Narosa Publishing House, New Delhi,: Proceedings of Renewable Energy Asis 2008 – An International Conference & 4th SEE Forum Meeting., held at IIT Delhi during 11 – 13 December 2008, pp. 928 – 936.
47. **Ganapathy Sundaram, E., Natarajan E. and Senthil Kumar K.R.** (2008), 'BIOMASS GASIFICATION AS AN ENERGY SOURCE FOR RURAL INDIA', International conference on "Resource utilisation and Intelligent System (INCRUIS –2008), Kongu Engineering college, Erode, Jan 3-5 ,2008
48. **Fogla, N., Pithandi, K. and Natarajan, E.** (2007), 'Theromodynamic optimisation of heat pipe by minimizing entropy generation', Book of Abstracts - Third Int. Conf. on Thermal Engineering: Theory and Applications (ICTEA 2007), May 21-23, The Hasbemite University and Ryerson Unicersity, Jordan, pp.19.
49. **Ganapathy Sundaram, E. and Natarajan E.** (2007), 'Bio Mass Utilization through Biorefineries' COBEM2007 19th International Congress of Mechanical Engineering, Brasília, DF, Brazil. November 5-9, 2007.

50. **Ganapathy Sundaram, E., Natarajan E. and Senthil Kumar K.R.** (2007), 'Studies on tar and particulate emissions of biomass gasifiers', International Conference on Advances in Energy Research (ICAER 2007), Indian Institute of Technology Bombay (IITB), December 12-14, 2007.
51. **Ganapathy Sundaram, E., Natarajan E. and Senthil Kumar K.R.** (2007), 'performance evaluation of down draft gasifier with different agricultural crop residue' GMSARN International Conference, Asian Institute of Technology (AIT), Thailand, December 12-14, 2007.
52. **Ganapathy Sundaram, E., Natarajan E. and Senthil Kumar K.R.** (2007), 'biomass energy to meet the future energy needs of industries', International conference on emerging challenges in design and manufacturing Technologies 2007, Sathyabama University, Chennai, Nov 28-30, 2007
53. **Shanmugam, V. and Natarajan, E.** (2007), 'Forced convection solar drying integrated with regenerated solid desiccants' Proceedings of the International Conference on Urban planning and environment strategies & Challenges, Elphinstone College, Mumbai-32., pp-263-269.
54. **Kannan, A. and Natarajan, E.** (2007), 'Adiabatic flame temperature and its influence on the process of cooking', Book of Abstracts - Third Int. Conf. on Thermal Engineering: Theory and Applications (ICTEA 2007), May 21-23, The Hasbemite University and Ryerson University, Jordan, pp.30
55. **Baskara Sethupathy,S. and Natarajan,E.** (2007), "Gasification of rice husk in fluidized bed systems", Proc. of the international conference and exhibition on emerging challenges in design and manufacturing technologies (ECHDEM 2007), Sathyabama University and combat vehicles research and development establishment, Chennai, India, pp. 217-219. (Received best paper award and cash prize).
56. **Ganapathy Subramnaian, L.R. and Natarajan, E.** (2007), 'Prediction of Air Pollution Concentration in Manali Region Using Gaussian Plume Model', COBEM2007, 19th International Congress of Mechanical Engineering, 5-9 November.
57. **Pitchandi. K., and Natarajan. E.** (2006), 'Entropy Generation in periodic Regenerative Heat Exchanger due to Finite Temperature Difference', International Conference on Advances in Mechanical Engineering, SRM University, Chennai, India, 14 – 16 December 2006, pp.481-486.
58. **Narayanan, K.V., and Natarajan. E.** (2006), 'Gaseous emission characteristics in a coal and biomass co-fired 18.68 MW power plant', International conference on Electricity – the Energy carrier for the present and the future, Kolkata, February.
59. **Sivakumar.S, Pitchandi.K., and Natarajan. E.** (2006), 'Modeling and optimization of Biomass Downdraft Gasifiers using fuzzy logic', AIAA, June 2006, U.S.A.
60. **Sivakumar.S, Pitchandi.K., and Natarajan.E.** (2006), 'Design and Analysis of Down Draft Biomass Gasifier Using CFD', International congress on Computational mechanics and simulation (ICCMS 06), IIT Guwahati.
61. **Madasamy, P., H.Subramanian, T.V.K.Mohan, S.Velmurugan, E.Natarajan and S.V.Narasimhan,** (2006), 'Design of experimental facilities for evaluating the propensity of materials to undergo flow assisted corrosion (FAC)' International conference on water chemistry of nuclear reactor systems, Oct 23 – 26, Jeju island, Korea (Accepted).

62. **Madasamy, P, H.Subramanian, T.V.K.Mohan, S.Velmurugan, E.Natarajan and S.V.Narasimhan (2005)**, 'Design and testing of FAC module for study of feeder pipe thinning under PHWR condition' in proc. of International conference on Corrosion (**CORCON 2005**), 28th-30th November, 2005, Chennai, India.
63. **Narayanan, K.V. and Natarajan, E. and P.Poisollamaiyan. (2005)**, 'Co-firing coal and biomass in a 18.68 MW power plant- Experiences', 14th ISME International conference of Mechanical Engineering in Knowledge age, Delhi College of Engineering, December.
64. **Sangeetha, V., Renganarayanan, S., Natarajan, E. (2004)**, 'Development of microcontroller for the battery management system for solar photovoltaic systems', 2nd International Energy Conversion Engineering Conference, Reston (Aug 16-19).
65. **Rajasekar M., Natarajan E. and Renganarayanan S. (2004)**, 'An artificial intelligence application in modelling of a biomass downdraft gasifier', II World Conference Technology Exhibition on Biomass for Energy, Industry and Climate Protection , May 10-14, Rome, Italy.
66. **Shelton Victor P., Natarajan E. and Renganarayanan S. (2004)**, 'Fluidized Bed Gasification of Biomass to carbon adsorbants and gas', EUROSUN 2004, June 20-23.
67. **Sudhahar R., Natarajan E. and Sivakumar S. (2004)**, 'CFD Analysis of Downdraft Gasifier', The International Mechanical Engineering Conference & Expo (IMEC2004), Marriott Courtyard Hotel, December 5-8., Kuwait (<http://www.imece2004.com>).
68. **Narayanan, K.V. and Natarajan, E. (2003)**, 'Review of co-firing technologies to reduce Greenhouse gas emissions from coal fired plants', International conference of Energy and Environment technologies for sustainable development, Malaviya National Institute of Technology, Jaipur.
69. **Rajendra Prasad A. and Natarajan E. (2003)** 'A model for optimizing the PV-wind-diesel hybrid system for rural village applications' Proc. of the International conference on new millennium-alternative energy solutions for sustainable developments, PSG College of Technology, Coimbatore, India, pp. 404-409.
70. **Shanmugam, V. and Natarajan, E. (2003)**. 'Solar flat plate collector for drying of agricultural products', Proceedings of the International Conference on Energy Technologies for sustainable Development, Malaviya National Institute of Technology, Jaipur, pp.343-348.
71. **Vijayalakshmi M.M., Natarajan E. and Shanmugasundaram V. (2003)**, 'Thermal comfort in residential buildings', International Conference on Energy Environment Technologies for Sustainable Development, Malaviya National Institute of Technology, Jaipur, India, Oct 8-10.
72. **Rajendra Prasad A. and Natarajan E. (2003)**, 'Parametric investigations on feasibility and prospects of a Hybrid System Nearby Chennai, India – A case Study', International Conference on Energy Environment Technologies for Sustainable Development, Malaviya National Institute of Technology, Jaipur, India, Oct 8-10.
73. **Rajendra Prasad A. and Natarajan E. (2003)** 'Parametric investigations on feasibility and prospects of hybrid system nearby Chennai, India- A Case Study', Proc. of the International conference on Energy and Environmental technologies for sustainable development, MNIT, Jaipur, India, pp. 175-179.

74. **Sudhagar P. and Natarajan E. (2003)**, 'Heat transfer characteristics in Circulating fluidised bed', International Conference on Energy Environment Technologies for Sustainable Development, Malaviya National Institute of Technology, Jaipur, India, Oct 8-10.
75. **Narayanan K.V and Natarajan E. (2003)**, 'Cofiring of coal and biomass fuels in power plants', International Conference on Energy Environment Technologies for Sustainable Development, Malaviya National Institute of Technology, Jaipur, India, Oct 8-10.
76. **Kandasamy K., Natarajan E. and Renganarayanan S. (2003)**, 'Comparitive analysis of biomass gasifiers for thermal and power applications', Proceedings of 17th International (ASME) FBC Conference: May 18-21, Jacksonville, Florida.
77. **Kandasamy K., Natarajan E. and Renganarayanan S. (2003)**, 'Producer gas cleaning techniques', Proceedings of 17th International (ASME) FBC Conference: May 18-21, Jacksonville, Florida.
78. **Vijayalakshmi M.M., Natarajan E. and Shanmugasundaram V. (2003)**, 'Prospects and problems in the application of renewable energy in residential buildings', International conference on New Millennium – Alternative Energy Solutions for Sustainable Development and PSG College of Technology, 26th National Renewable Energy Convention of SESI, Peelamedu, Coimbatore – 641 004, 17-19 January, pp.377-380.
79. **Rajendra Prasad A and Natarajan E. (2003)** 'A Model for Optimizing the PV-Wind-Diesel Hybrid System for Rural Village Application', International conference on New Millennium Alternative Energy Solutions for Sustainable Development and PSG College of Technology, 26th National Renewable Energy Convention of SESI, Peelamedu, Coimbatore – 641 004, 17-19 January, pp.404-409.
80. **Vijayalakshmi M.M., Natarajan E. and Shanmugasundaram V. (2002)**, 'Renewable energy and energy efficiency in residential buildings', International Conference on Recent Advances in Solar Energy Conversion systems', Sept.-28-29, Maulana Azad National Institute of Technology, Bhopal (M.P), India, pp.295-297
81. **Ganapthy Subramnaian, L.R. and Natarajan, E. (2001)**, 'Pollution from Combustion Plants', in the 12th ISME conference held during January 10-12, 2001, at Department of Mechanical Engineering, Crescent Engineering College, Vandalur, Chennai, pp. 16-20.
82. **Ganapthy Subramanian, L.R. and Natarajan, E (2001)**, 'Global Warming Modelling', Proceedings of 25th National Renewable Energy Convention of SESI, 27th-29th December, at REC Warangal, pp. 378-383
83. **Shanmugam, V. and Natarajan, E. (2001)**, 'Solar Flat Plate Collector for Drying Agricultural Products', International Conference on Energy Environment Technologies for Sustainable Development, Malaviya National Institute of Technology, Jaipur, India, Oct 8-10.
84. **Ganapthy Subramnaian, L.R. and Natarajan, E. (2001)**, 'Air pollution Modelling' in the MINAC-2001, 18th October 2001, at JNTU College of Engineering, Anapatur, pp 406 - 410.
85. **Ganapthy Subramnaian, L.R. and Natarajan, E. (2000)**, 'Biomass Energy for Sustainable Development', Proceedings of National Conference on Commercialization Aspects of Renewable Energy Sources (CARES-2000), April 28-29, Department of Renewable Energy Sources, College of Technology & Agricultural Engineering, Agricultural University, Udaipur, pp. 80-86.

86. **Natarajan E. and Rao A.N.** (1998), 'Parametric Study on Gasification of Rice Husk in a Fluidized Bed Reactor', Abstracts of International Conference on Role of Renewable Energy Technology for Rural development (RETRUD-98), October 12-14, Kathmandu, Nepal, pp.17.

87. **Natarajan E. and Rao A.N.** (1998), 'Experimental Investigation on fluidized bed gasification of rice husk', Proceedings of 27th International Symposium on Combustion, August 2-7, University of Colorado at Boulder, USA, August 2-7. pp523.

d) Selective List in National Conference :

1. **Prakash .M and Natarajan. E.** "Review on application of non conventional energy source: solar stills", National conference on recent trends and developments in sustainable green technologies 24th– 25th MARCH, 2015MIT-Anna University.

2. **Prakash .M and Natarajan. E.** "Single basin and single slope solar still: various basin material thermal research", National conference on recent trends and developments in sustainable green technologies 24th– 25th MARCH, 2015MIT-Anna University.

3. **Prakash .M and Natarajan. E.** "Asymmetrical solar still with various basin materials", the "National Conference on Evolution of Green Energy and (NCEGEVT – 2K15)", Sri Venkateshwara College of Engineering, Chennai, India, 2015.

4. **Prakash .M and Natarajan. E.** "Rain maker performance evaluation: basin materials" held in National Conference on Safety Environment and Industrial Applied Science & Technology, A C Tech Campus Anna University. 04th – 06th Feb 2015.

5. **Prakash .M and Natarajan. E.** "Parametric studies on passive single basin solar still experiment" held in CNRES, Periyar University, Salem. 27th February 2014.

6. **Prakash .M and Natarajan. E.** "Solar still integrated with porous material" Tiruchirappalli, India : (NC-GET 2014) 5th – 6th December 2014.

7. **Prakash .M and Natarajan. E.** "Rain device with step wise basin enhanced condensation performance evaluation" Tiruchirappalli, India : (NC-GET 2014) 5th – 6th December 2014.

8. **Prakash .M and Natarajan. E.** "Performance Evaluation of Single Basin Solar Still, Energy Forum, IIT Madras, "Renewable Energy Day 2013" 20th August, 2013 at Hall No.3, IC&SR Building.

9. **Srimanickam, B. and Natarajan, E.** "A key review on diverse analysis of PV/T Hybrid system", the "Emerging Trends in Mechanical Engineering [ETME]", Valliammai Engineering College, Chennai, India, 2014.

10. **Srimanickam, B. and Natarajan, E.** "Comparative study of solar PV and PV/T system", the "National Level Conference on Advancement in Mechanical Engineering (NCAME 2K14)", Sree Sastha College of Engineering, Chennai, India, 2014.

11. **Dillibabu .V and Natarajan. E.** "Simulation of coal-steam gasification and combined air – steam gasification of coal-biomass blends". National Conference on Advancement in Mechanical Engineering, Sree Sastha College of Engineering, Chennai, September 11, 2014.

12. **Rekha L, M M Vijayalakshmi and E. Natarajan.** "Studies on Carbon Foot Print of Residential Buildings" in the national conference on ESTSD at Aarupadai Veedu Institute of

Technology, Paiyanoor in Technical collaboration with Regional Metrological Centre, Chennai. 2011.

13. **Madasamy P, Andrews Sylvanus R ,Krishnamohan T V, Velmurugan S and Natarajan E** “Hydrodynamic effects of single phase flow on a plaster of Paris elbow” National Conference on Emerging Research& Advances in Mechanical Sciences 23rd March 012, Velammal Engineering College ,Chennai-66,Tamilnadu, India.
14. **L. Rekha , M M Vijayalakshmi and E. Natarajan.** “Photovoltaic Thermal Solar Water Heater for Domestic Applications in Chennai” in the international conference on ISHMT at IIT, Chennai, December 28-30-2011.
15. **Rekha, L, E. Natarajan and M .M. Vijayalakshmi.**“ Reduction in Green house Gases by Green buildings”, National conference on Trends in Renewable Energy sources, applications & Climate change, Sathyabama University, 23-25 July 2010.
16. **L. Rekha ,E. Natarajan and M M Vijayalakshmi.**“Studies on residential buildings with integrated solar systems”, National conference on Trends in Renewable Energy sources, applications & Climate change, Sathyabama University, 23-25 July 2010
17. **Ganapathy Sundaram, E., Natarajan E. and Senthil Kumar K.R. (2008)**, ‘Studies on pyrolysis of Agricultural residues’, Proceedings of the National conference on “Energy - 2008”, NIT Calicut, 31 January & 1st February.
18. **Natarajan, E. (2008)**, “Bio-mass Energy Conversion and Utilization in India”, National Seminar on Energy Crisis – Remedial Measures, Jan 3-4, 2008, Organised by SEEE, Department of Electrical and Electronics Engineering, S.A.Engineering College, Chennai - 77.
19. **Baskara Sethupathy,S., E.Natarajan and M.Karthick (2008)** “Mathematical modeling of a fluidized bed gasifier - Overview”, Proceedings of National conference on Mathematical modeling in global perspective, Velammal Engineering College, Chennai,India.pp.32-39.
20. **Ganapathy Sundaram, E., Natarajan E. (2007)**, ‘PROSPECTS OF BIO ENERGY CONVERSION THROUGH BIOMETHANATION’, National Conference on Recent Trends In Renewable Energy Conversion System And Applications, Annamalai University, Feb, 2007.
21. **K.V.Narayanan, E.Natarajan**, “An approach towards zero CO₂ emission”, National conference on advances in Mechanical Engineering, Jawaharlal Nehru Technological University, Anantapur, 2001.
22. **K.V.Narayanan, E.Natarajan**, “CO₂ capture from flue gases of power plants”, National conference on advances in Mechanical Engineering, Jawaharlal Nehru Technological University, Anantapur, 2001.
23. **Pitchnadi K. and Natarajan E. (2005)**, “Study on entropy generation in Pipe-in –Pipe heat exchanger ”, Presented in the national conference held in Muffakham Jah College of engineering and Technology, Hyderabad during July 28-30.
24. **Sivakumar.S,and Natarajan.E. (2005)**, “Modeling and Simulation of Downdraft Biomass Gasifier” Muffakham Jah College of engineering and Technology, Hyderabad, July 28-30, pp 232 – 245.

25. **Sivakumar.S, Sudhahar.R., and Natarajan.E.** "CFD Analysis of Biomass Downdraft Gasifier". Accepted in the 18th National and 7th ISHMT - ASME Heat and Mass Transfer Conference. IIT Guwahati, January, 4-6, 2006.
26. **Senthil Kumar .R and Natarajan .E** "Heat transfer and flow analysis in flat plate PV/T hybrid system using Computational Fluid Dynamics (CFD)" in the National Conference on Advancement of Mechanical Engineering 2k14" 11th September 2014, Sree Sastha College of Engineering, Chennai.
27. **Rao, J.S., Natarajan, E and Praveen Kumar, P.** (2005) , "Cold model study of pressurised fluidised bed gasifier using conical distributor for integrated gasification combined cycle power plants, Presented at ADSOPHOS 2K5 –Towards Intelligence: National Level Technical Symposium (February 25 –26) conducted at M.J.College of engineering and Technology, Hyderabad – 500 034
28. **Vijayalakshmi M.M., Natarajan E. and Shanmugasundaram V.** (2005), 'Role of Insulation in energy efficient buildings', presented in the three day national level seminar on Sustainable Technologies in Civil and Mechanical Engineering (STCM – 2005), July 28-30, 2005, M.J.College of Engineering and Technology, Hyderabad – 500 034
29. **Madasamy P., Subramanian H., Mohan T.V.K., Velmurugan S. Natarajan E. and Narasimhan, S.V.** (2004), 'Theoretical simulation of hydrodynamic parameters for understanding FAC in PHWR', Presented and published in National Conference on ageing management of structures, systems and components (NCAM-2004), Nuclear Power Corporation of India Ltd., N.U.Bhavan, Anushakthinagar, Mumbai – 400 094.
30. **Rao J.S., Natarajan E. and Praveenkumar** 'Cold Model Study of PFBG using conical distributor for IGCC Power Plants', Presented and Published in ADSOPHOS 2K5 – Towards Intelligence, National Level Technical Symposium conducted from 25th to 26th February 2005, M.J.College of Engineering and Technology, Hyderabad – 500 034
31. **Narayanan K.V and Natarajan E.** (2001), 'CO₂ Capture from flue gases of power plants – A perspective', Proceedings of National Conference on Advanced trends in Mechanical Engineering Research and Development', Department of Mechanical Engg., JNTU College of Engineering, Anantapur – 515 002, 18th October, pp.118-122.
32. **Narayanan K.V and Natarajan E.** (2001), 'An approach towards zero CO₂ emission' Proceedings of National Conference on Advanced trends in Mechanical Engineering Research and Development', Department of Mechanical Engg., JNTU college of Engineering, Anantapur – 515 002, 18th October, pp.123-129.
33. **Shanmugam V. and Natarajan E.** (2001), 'Solar Cookers for rural India', Proceedings of National Conference on Advanced trends in Mechanical Engineering Research and Development', Department of Mechanical Engg., JNTU college of Engineering, Anantapur – 515 002, 18th October, pp.130-133.
34. **Kandasamy K and Natarajan E.** (2001), 'Biomass:Energy for the twenty-first century', Proceedings of National Conference on Advanced trends in Mechanical Engineering Research and Development', Department of Mechanical Engg., JNTU college of Engineering, Anantapur – 515 002, 18th October, pp.241-246.
35. **Sudhagar P. and Natarajan E.** (2001), 'Circulating bed technology', Proceedings of National Conference on Advanced trends in Mechanical Engineering Research and

Development', Department of Mechanical Engg., JNTU college of Engineering, Anantapur – 515 002, 18th October, pp.247-256.

36. **Rajendra Prasad A and Natarajan E.** (2001), Modelling of solar photovoltaic systems, Proceedings of National Conference on Advanced trends in Mechanical Engineering Research and Development', Department of Mechanical Engg., JNTU college of Engineering, Anantapur – 515 002, 18th October, pp.401-405.
37. **Rajendra Prasad A. and Natarajan E.** (2001) 'Modeling of solar photovoltaic systems', Proc. of the National conference on advanced trends in Mechanical Engineering research and development, JNTU colleges of engineering, Anantapur, pp. 177-181.
38. **Rajendra Prasad A. and Natarajan E.** (2001) 'A comparative life cycle cost analysis of photovoltaic and diesel generator' Proc. of the 25th National Renewable Energy Convention of the SESI, REC, Warangal, India, pp. 171-177.
39. **Ganapathy Subramanian, L.R. and Natarajan, E.** (2001), 'Air pollution modelling', Proceedings of National Conference on Advanced Trends in Mechanical Engineering Research and Development', Department of Mechanical Engg., JNTU college of Engineering, Anantapur – 515 002, 18th October, pp.406-410.
40. **Natarajan, E.** (2000), 'Design Aspects for Commercial Photovoltaic Systems', the Proceedings of National Conference on Commercialization Aspects of Renewable Energy Sources (CARES-2000), April 28-29, 2000, Organised by Deptt. of Renewable Energy Sources, College of Technology and Agricultural Engineering, Udaipur, pp.65-71.
41. **Ganapathy Subramanian, L.R. and Natarajan E.** (2000), 'Biomass Energy for Sustainable Development', Proceedings of National Conference on Commercialization Aspects of Renewable Energy Sources (CARES-2000), April 28-29, Organised by Dept. of Renewable Energy Sources, College of Technology and Agricultural Engineering, Udaipur, pp.80-86.
42. **Rajendra Prasad A. and Natarajan, E.** (2000), 'Energy Storage Devices for Photovoltaic Systems', Proceedings of National Conference on Commercialization Aspects of Renewable Energy Sources (CARES-2000), April 28-29, 2000, Organised by Deptt. of Renewable Energy Sources, College of Technology and Agricultural Engineering, Udaipur, pp.62.
43. **Natarajan, E. and Elayaperumal, A.** (2000) 'Solar Energy: Potential and Prospects for Commercial Exploitation', Accepted for Publication in the Proceedings of National Conference on Commercialization Aspects of Renewable Energy Sources (CARES-2000), April 28-29, 2000, Organised by Deptt. of Renewable Energy Sources, College of Technology and Agricultural Engineering, Udaipur, pp.181-184
44. **Natarajan E. and Rao A.N.** (2000) 'Measurement of Agglomeration Tendency in a Fluidized Bed Combustor and gasifier', Feb 25-26, 2000, Proceedings of National Symposium on Intelligent Measurement and Control (NSIMC-2000), Organised by M.I.T., Anna University, Chennai.
45. **Rajendra Prasad A. and Natarajan E.** (1999), 'Electricity by Photovoltaic Systems, Proceeding of the 23rd National Renewable Energy Convention '99, December 20-22, Devi Ahilya Vishwavidyalaya, Indore, 1999, pp.112-115.
46. **Natarajan E., Renganarayanan S. and Rao A.N.** (1997), 'Economic Analysis of Fluidized Bed Rice Husk Gasification System in Rice Mills', Towards Commercialisation of Clean

Energy, Proceedings of the National Solar energy Convention – 97, December 22-24, Anna University, Chennai, India, pp.581-588.

47. **Natarajan E. and Rao A.N.** (1997), 'Solar Photovoltaic Systems for Energy', Proceedings of National conference on Application of Solar Energy - Recent Developments', Energy Research Centre, Thiruvananthapuram, 20-21 November.
48. **Natarajan E., Sethumadhavan R., Renganarayanan S., and Rao A.N.** (1996), 'Fluid Bed Gasification of Rice Husk', Towards Clean Energy-Proceedings of the National Solar Energy Convention 1996, Jadavpur University, Calcutta, December 27-29, pp.257-260.
49. **Natarajan E., Srinivasan K. and Rao A.N.** (1995), 'Biomass gasification', National Conference on conversion and utilisation of biomass, Mahatma Gandhi Institute of Integrated rural energy Planning and Development, Delhi, November 16-17, pp.173-188.

4. Subjects Expertise

- Thermodynamics
- Thermal Engineering
- Power Plant Engineering
- Gas Dynamics
- Aerodynamics
- Jet Propulsion
- Gas Turbines
- Fluid Bed Systems
- Boiler Technology
- Combustion Engineerin

5. Projects/Consultancies:

Major projects Involved

1. Indo-Swedish Biomass Gasification project on Agricultural residues 02-01-1995 to 31-12-1999 - 35 Lakhs Completed.
2. Biomass Gasifier Renovation Consultancy Project at Portplair (1999).
3. Wind Turbine Capacity factor Consultancy Project (2009)
4. Lignite Slurry Study Consultancy project with NLC (2012) – 7.5 Lakhs
5. Lignite Agglomeration Study Consultancy project with NLC (2013) – 135 Lakhs (proposal submitted, awaiting the confirmation reply)
6. Retainer consultance on Technical advice to improve the performance of gasifier systems NSP green energy technologies, Chennai, Completed (30-12-2011 to 03-01-2012) 10000.00 Completed
7. Pilot Plant Feasibility Study on HA- solid slurry by-product from lignite as fuel CARD, Neyveli Lignite Corporation (02-01-2012 to 30-03-2012) 750000.00 Completed.
8. Assessment study of wind mill plant load factor for RSJ. Ozone P ltd. Tiruppur(01-01-2009 to 01-01-2010) 100000.00 Completed

6. Books Published

1. Natarajan E, Second edition, Revised and updated “Engineering thermodynamics” 2014 published by Anuragan publication.
2. Natarajan E, First edition, Engineering Thermodynamics : Fundamentals and Applications, Anuragam Publications (2012). <http://www.anuragam.in/>
3. Natarajan E, Steam Tables, Anuragam Publications (2012).
4. Sustainable Strategies on Technology and Management for Developing Countries, (Co-editor with Prof.M.Seeman, Anuragam Publications (2010).
5. Madasamy P, Andrews Sylvanus R ,Krishnamohan T V, Velmurugan S and Natarajan E Design of a Stirred Reactor for FAC studies based on CFD modeling, Mathematical Modeling and Applications to Industrial Problems Published in Macmillan Publishers India Ltd, pp 117-126.

7. Accolades Received

- 1) Secured **UNIVERSITY FIRST RANK** in B.E.(Mechanical Engineering) in 1988.
- 2) Winner of the **Sir Gabriel Stokes Prize (Mechanical Branch) 1988 and the Dr.A.L.Mudaliar Prize (1988)** for being **GOLD MEDALIST** in B.E.
- 3) Winner of **Distinguished Alumnus Award** for the year 1999 from Alumni association of Vellore Engineering College, Vellore **for best consistent performance in B.E.**
- 4) Specially trained by M/s **Siemens Solar Industries** – Camarillo, California USA, on **Solar Photovoltaic System Design**, sponsored by M/s Indian Renewable Energy Development Agency Limited, New Delhi under the World Bank Solar PV Market Development Programme. During this programme:

- 5) Have been the **Faculty Advisor** to the team that won **the International second place** for the technical Paper titled “Design of Transport Aircraft for the Future” held at **NASA**, United States of America and Visited Atlanta to attend NASA Fundamental Meet 2008 held during 6-9th October 2008 for the same.

8. Others

1. Administration :

Sl.No	Office	Designation	Period
1	Controller of Examination Anna University Chennai-600 025	Zonal Officer Zone - I	Aug 2002 – April 2007
2	CUIC Anna University Chennai-600 025	Placement and Training Officer	Nov 1999 – April 2002
3	Society of Mechanical Engineers	President	Jun 2008 – Jun 2009
4	Additional Controller of Examination Anna University Chennai-600 025	UG Chief Superintendent of Examinations	April 2011 – May 2011
5	Controller of Examination Anna University Chennai-600 025	Additional Controller of Examination	July 2012 – Nov 2012
6.	Office of Dean CEG	UG Time Table Coordinator	May 2012 to May 2013
7.	College of Engineering Anna University Chennai-600 025	Secretary Green Brigade, CEG	Feb 2013 – Till date

2. Abroad Visited:

Sl.No	Institution/Company	Period	Purpose
1	Siemens Solar Industries, California, USA	May 1996	Advanced Seminar and Technical Tour on Solar Photovoltaic system
2	Royal Institute of Technology and Energy Technology Centre, Sweden	Aug – Nov 1996	Research and Training Programme on Biomass Utilization

3	Royal Institute of Technology and Energy Technology Centre, Sweden	April- July 1997	Research and Training Programme on Biomass Utilization
4	NASA Fundamental meet Atlanta USA	Oct 2008	To Receive International Second Prize for the Conceptual Design of Future Aircraft.
5	Aston University Birmingham UK	Oct 2008	Bilateral Discussions on Biomass Pyrolysis Research Programme
6	World Academy of Science , Engineering and Technology, Singapore	May 2011	Paper presentation on Biomass Pyrolysis
7	College of Nuclear Science, National Tsing Hua University, Taiwan	Sep, 2012	South East Asia International Joint research and Training Program- Energy and Environmental impact in 21 st century.