

Figure 18: Streamlines for temperature distribution of Circular tube at 11.45 am of the day

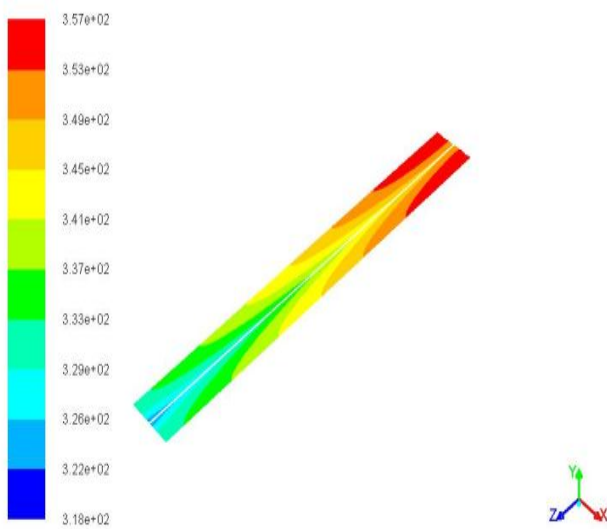


Figure 19: Streamlines for temperature distribution of Elliptical tube at 11.45 am of the day

volumen XIV (número 4), octubre-diciembre 2013: 553-561.

- [3] S.Eswaran, M.Chandru, M.Vairavel, R.Girimurugan, "Numerical Study on Solar Water Heater using CFD Analysis," International Journal of Engineering Sciences & Research Technology [Eswaran, 3(3): March, 2014, [1485-1489].
- [4] Manjunath M.S, K. Vasudeva Karanth, and N. Yagnesh Sharma, "A Comparative CFD study on Solar Dimple Plate Collector with Flat Plate Collector to Augment the Thermal Performance," World Academy of Science, Engineering and Technology Vol:6 2012-10-21.
- [5] Prof. P.W.Ingle, Dr. A. A. Pawar, Prof. B. D. Deshmukh, Prof. K. C. Bhosale, "CFD Analysis of Solar Flat Plate Collector," International Journal of Emerging Technology and Advanced Engineering, ISSN 2250-2459, Volume 3, Issue 4, April 2013.
- [6] Fabio Struckmann, "Analysis of a Flat-plate Solar Collector", 2008 MVK160 Heat and Mass Transport, May 08, 2008, Lund, Sweden.

Author Profile



Vishal G. Shelke is a student of Master of Engineering in, Advance Manufacturing and Mechanical System Design Shri Sant Gajanan Maharaj College of Engineering, Shegaon, of (M.S.) India. He received a degree of Bachelor of Engineering in Mechanical Engineering from Sant Gadge Baba Amravati University, Amravati, (M.S.), India



Prof. Chinmay V. Patil is currently holding a position as Assistant Professor in Mechanical Engineering Department of S.S.G.M. College of Engineering, Shegaon (M.S.) India. He has 10 years of experience in academics. His research interests include Computer Aided Design and Manufacturing and Solar Energy Utilization.

5. Conclusion

From the above study it is concluded that elliptical tube of case no. 5 (i.e. $B=0.5A$) gives the maximum outlet temperature of water for the same heat flux and inlet temperature in comparison with circular and other elliptical geometries. It also shows the peak outlet temperature difference between circular and elliptical tube is $4.17\text{ }^{\circ}\text{C}$. This shows that elliptical tube is beneficial in future for domestic purpose.

References

- [1] Mohamed Selmi, Mohammed J. Al-Khawaja and Abdulhamid Marafia, "Validation of CFD simulation for flat plate solar energy collector," Renewable Energy 33 (2008) 383–387.
- [2] Marroquín-De Jesus Angel, Olivares-Ramirez Juan Manuel, Zamora-Antuñano Marco Antonio, Jiménez-Sandoval Omar and Encinas-Oropesa Armando, "Analysis of Flow and Heat Transfer in a Flat Solar Collector with Rectangular and Cylindrical Geometry Using CFD," Ingeniería Investigación y Tecnología,