Heat Transfer Enhancement In Fluids Using UltraSonic Waves

Hrushikesh Mohite
Department of Mechanical Engineering, IIT Bombay

Abstract

Ultrasonic waves are pressure waves with frequencies greater than 20 kHz. When introduced in a liquid, these waves generate high-pressure amplitude variations, leading to phase change, cavitation, turbulence and intense mixing. These phis phenomena are desirable in enhancing heat transfer rates in fluids. This case study aims to study the variation of the heat transfer due to ultrasonic waves relative to a stationary fluid where heat transfer occurs mainly due to natural convection.An experimental setup described in (Dehbani et al., 2014) is attempted to be recreated in order to compare and study the heat transfer rates properly.

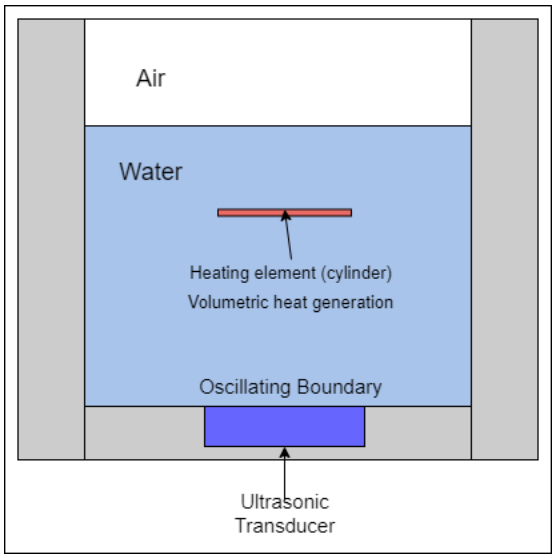

Figure 1: Problem Shematic

References

Dehbani, M., Rahimi, M., Abolhasani, M., Maghsoodi, A., Afshar, P. G., Dodmantipi, A. R., & Alsairafi, A. A. (2014, Sep 01). Cfd modeling of convection heat transfer using 1.7 mhz and 24 khz ultrasonic waves: a comparative study. *Heat and Mass Transfer*, *50*(9), 1319-1333. Retrieved from `https://doi.org/10.1007/s00231-014-1346-9` doi: 10.1007/s00231-014-1346-9