

ABSTRACT Heat exchangers are considered to be critical components of thermoacoustic systems and their appropriate design and development are essential for the development of next generation of thermoacoustic systems. In this work, the heat transfer and oscillatory flow behaviour in and around three identical parallel-plate heat exchangers with constant wall temperatures were investigated using 2-D CFD simulation method. The heat exchangers are arranged in series (one 'heat source' centrally positioned between two 'heat sinks') and placed within an oscillatory flow induced by a standing wave. The effects of three different edge shapes (blunt, ogive and round) at the entrance and exit of heat exchanger channels on the oscillatory velocity and temperature fields and the wall heat fluxes are reported for the drive ratios between 0.3 and 2.0%. The descriptions of the underlying oscillatory flow and heat transfer physics are given.