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INFLUENCE OF WALL TEMPERATURE ON SHOCK TRAIN STRUCTURES IN A SCRAMJET ISOLATOR

Abstract

As an important component of the scramjet engine, the isolator plays a key role in the engine performance and flight success. The flow mechanism of shock train structures in very complicated. In this paper, numerical simulations of the flowfield in a scramjet isolator with different wall temperatures are present. The wall temperature is varied between 300K and 1000K while the backpressure is constant. The shock train structures are analyzed in detail. The location of the shock train leading edge and the length of shock train are both compared with different wall temperature, and the streamwise pressure distributions along the wall are also shown in figures. The results show that a thicker boundary layer is induced by a higher wall temperature and may choke the flow. The location of the shock train leading edge becomes further forward alongside as the wall temperature increases.