Abstract

Operation and performance evaluation of an ejector based refrigeration system subjected to external constraints and allowing for components interactions to be accounted for is presented. In this respect and relying on the identified most influential parameters, effects of generator conditions in terms of superheat, pressure and flow rate resulting from the imposed heat source temperature constraints on the condenser and evaporator conditions are shown to affect ejector operation efficiency as well as overall system performance. More particularly, the system is found to have two modes of operation corresponding respectively to ejector double choking (on design) and single choking (off design). In the first mode the system operation is stable with fixed thermal load and constant evaporator temperature. In the second mode, only the primary nozzle is choked, corresponding to less operation stability and variable temperature conditions in the evaporator with fixed thermal load.