

Abstract Submitted  
for the DFD16 Meeting of  
The American Physical Society

**Numerical study and validation on a two-phase ejector flow using R134a refrigerant**<sup>1</sup> SUNGHOON BAEK, SIMON SONG, Hanyang University —

An ejector is a pumping device that uses a low pressure jet flow to entrain a low-momentum secondary flow, and the two flows are mixed and pressurized in a mixing tube and a diffuser. When the ejector replaces an expansion valve in a standard refrigeration cycle, a compression work can be saved by the pumping effect and the efficiency of the cycle is known to be improved. However, the details of flow characteristics in the ejector are still unknown due to difficulties in experiments and complex flow phenomena. We numerically studied a supersonic ejector flow of R134a refrigerant, and validated the results against experimental data. As a results, we found that combinations of mixture, realizable k-epsilon, evaporation-condensation models, and energy equation are suitable to predict the ejector performance in a design point of view.

<sup>1</sup>This work was supported by the National Research Foundation of Korea(NRF) grant funded by the Korea government(MSIP) (No. 2016R1A2B3009541)

Sunghoon Baek  
Hanyang University

Date submitted: 01 Aug 2016

Electronic form version 1.4