**The Uncertainties in the Critical Flow Functions Predicted by AGA8-DC92 and GERG-2008**

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The uncertainties in the critical flow functions (CFFs) predicted by the AGA8-DC92 and the GERG-2008 equations of state (EOSs for compression factor) were estimated. To this end, the thermodynamic properties such as enthalpy, entropy, compression factor, and speed of sound, which are used in calculating the CFF, were expressed in the form of dimensionless Helmholtz free energy and its derivatives. In order to consider the variations in the thermodynamic properties induced by the variation (i.e., uncertainty) in compression factor, the form of Helmholtz free energy for each EOS was modified to have a deviation corresponding to the EOS uncertainty under each flow condition. For each independent uncertainty component of the CFF, a model for uncertainty contribution was developed. As a result, the uncertainties in the CFF were estimated to be 0.05 % for the GERG-2008, 0.1 % for the AGA8-DC92 at stagnation temperatures of 288 K to 350 K and at stagnation pressures up to 10 MPa.