**The Error Model of Turbine Flowmeter Based on Reynolds Number**

**Han Zhang1, Chunhui Li1, Peijuan Cao1, 2**

*1* *National Institute of Metrology (NIM),* [*zhanghan@nim.ac.cn*](mailto:zhanghan@nim.ac.cn)*, Beijing, P. R. China*

*2 Hebei University, Baoding, P. R. China*

*E-mail (corresponding author): lich@nim.ac.cn*

# Abstract

The high pressure close loop gas flow facility was built in the National Institute of Metrology (NIM). The 4 sets of turbine flowmeters were selected as master meters of the facility, which were calibrated by sonic nozzles at different pressures and flow points in original position. The calibration results showed that the curve fitting of meter error was obviously spread under the critical Reynolds number. Based on the physical model of turbine meter, the NIM-2015 model related to Reynolds number and thermodynamics property of working fluid was presented. The reliability of the new model was also verified in this paper.