



Contribution ID: 106

Type: **not specified**

## Progress in Development of ITER Diagnostic Pressure Gauges and Status of Interfaces with ITER Components

*Monday, 17 September 2018 11:00 (2 hours)*

Neutral gas pressure is one of the main parameters for basic control of ITER operation. Diagnostic Pressure Gauges shall provide pressure measurements in the range from 10-4 Pa to 20 Pa with an accuracy of 20 % and a time resolution of 50 ms. In total 52 DPG sensor heads will be installed in 4 lower ports, 4 divertor cassettes and 2 equatorial ports. The overall DPG system has 15 interfaces with various systems and components of ITER.

Within a Framework Partnership Agreement with F4E, IPP is developing the DPG system including sensor head and front-end electronics. A test campaign aiming at validation of the system baseline design is currently ongoing.

Performance of the DPG sensor head has been investigated for various parameters of the prototype as electrode potentials, transparency of the acceleration grid and electron emission current. The test results demonstrate the possibility to measure pressures up to 30 Pa.

Emission properties of several material candidates for the filament (hot cathode) have been studied during approximately three months of continuous operation. Filament samples made of Tungsten with 2 % doping of ThO<sub>2</sub> and Tungsten alloy with 26 % of Rhenium coated with Y<sub>2</sub>O<sub>3</sub> demonstrated most promising results. These cathodes required lowest heating currents for fixed emission current. Mechanical tests of these samples showed no considerable deformations for maximum heating currents in transient magnetic fields of up to 8 T.

The already obtained as well as future test results will be used for further design optimization and integration of the DPG system into the ITER environment.

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**Session Classification:** P1

**Track Classification:** Diagnostics