

VESPA

Vaso per Esperimenti Su Plasmi ed Altro

Andrea Grossutti, mat. 1237344
Alessandro Lovo, mat. 1236048
Leonardo Zampieri, mat. 1237351

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1 Aims

Study the *Vespa* experimental apparatus, and in particular:

- Model the vacuum system behavior, finding the characteristic parameters;
- Obtain the current-voltage and the current-temperature characteristics curves of the filament;
- Draw the voltage-current characteristics curves of the gas discharge, enhancing their behavior as varying pressure;
- Find the Paschen curve, both in DC and RF condition;
- Measurement of plasma parameters through a Langmuir probe, both in stationary conditions and via ionic-sonic wave propagation.

2 Vacuum system

The vacuum inside the VESPA vessel is obtained and kept thanks to a rotary pump and a turbomolecular pump. The vessel is not perfectly isolated and some small leaks affect the vacuum keeping. To study this phenomena, the vessel has been taken to a low pressure (...) and all the valves around has been closed. Measuring (thanks to a ionization pressure gauge) the pressure in the vessel as function of the time, effect as leaks and degasing can be observer.

Highering pressure plot

Subsequently, the valves has been opened; the turbomolecular pump acts to extract all the gas from the vessel, and therefore a pressure lowering can be observed.

Lowering pressure plot

3

insert pressure