Title: Automation of dust charging experiment
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Abstract:
Since the dust grains are expected to cause problems during operation of tokamaks, there is a developing research of these devices which raises interest in dust grain charging processes research as well. Clarification of the dust grain charging processes may help with their solutions. This thesis deals with an issue of designing a part of a new experimental setup for dust grain research built at the Department of Surface and Plasma Science, Charles University in Prague. The base of this experimental setup is original linear quadrupole trap enabling dust grain trapping and its charging by electron, ion, and UV beams. In the thesis, a method of stabilization of one part of grain oscillation frequency detection is described. The thesis is focused on a development of a control unit and high voltage power supply for an image intensifier.

To measure charging processes tungsten dust grains were used. This material will be probably used in construction of ITER tomakak. Electron equilibrium characteristics and other parameters were measured. Two samples of tungsten dust grains were used for observations.

Keywords: dust grain, charging process, optical detection, tungsten