# Poisson simulation for high voltage terminal of test stand for 1MV electrostatic accelerator

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## 1. Introduction

KOMAC provide ion beam to user which energy range need to expand to MeV range and develop 1 MV electrostatic accelerator. The specifications of the electrostatic accelerator are 1MV acceleration voltage, 10 mA peak current and variable gas ion. We are developing test stand before set up 1 MV electrostatic accelerator. In order to confirm the stable operation condition for ion source in high pressure tank, test stand should be developed and operated at atmospheric pressure. The test stand voltage is 300 kV and operating time is 8 hours. The test stand is consist of 300 kV high voltage terminal, DC-AC-DC inverter, power supply device inside terminal, 200MHz RF power, 5 kV extraction power supply, 300 kV accelerating tube and vacuum system. The beam measurement system and beam dump will be installed next to accelerating tube. Poisson code simulation results of the high voltage terminal are presented in this paper.

## 2. Simulation Results

The high voltage terminal is consist of the 300 kV insulators and terminal part (Fig. 1.). The high voltage terminal was assembled, it was conducted on high voltage test. 200 MHz RF ion source and power supply device for Cockcroft-walton will be installed at first stage and second stage in the terminal.

Fig. 1. The high voltage terminal for test stand

The Poisson code calculates static electric or magnetic fields in two-dimensions. The Poisson and Pandira programs use a conformal triangular mesh to find electrostatic or magnetostatic fields.

The high voltage terminal was simulated with Poisson code. The simulation results are shown in Fig. 2 and 3. It was simplified the half structure with a 300 kV insulator and terminal box (conductor). The electric field strength was calculated and lines were indicated equipotential line. The largest value of the electric field strength was near the junction of the insulator and terminal. The equipotential lines were concentrated at side of the junction part. The electric field strength was confirmed with reasonable results. This structure was suitable for the terminal of the test stand.

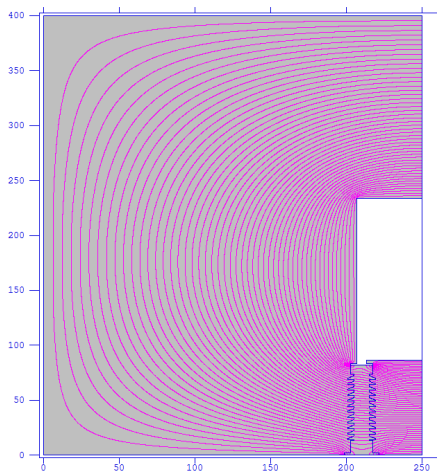


Fig. 2. Poisson code result of the high voltage terminal

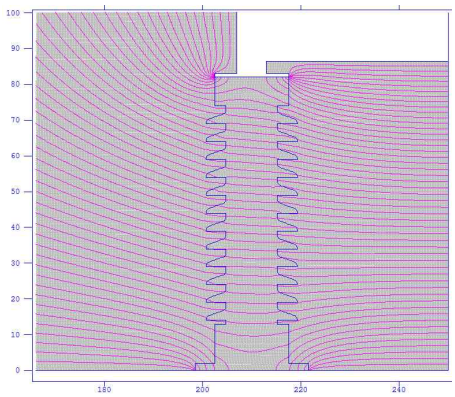

Fig. 3. The structure of the 300 kV insulator

## 3. Conclusions

Poisson code has been used to calculate the electric field for high voltage terminal. The results of simulation were verified with reasonable results. The poisson code structure could be apply to the high voltage terminal of the test stand.

## ACKNOWLEDGMENTS

## REFERENCES

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