

## Characteristics of electric field in the liquid metal ion source with a suppressor

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The liquid metal ion sources(LMIS) in FIB system have many advantages of high current density, high brightness and low ion energy spread. Most FIB systems use LMIS because the ion beam spot size of LMIS is smaller than other ion sources. LMIS is basically emitted by an extractor but the new electrode called the suppressor is able to control the emission current.

We investigated characteristics LMIS with a suppressor, the function of the suppressor in LMIS, the change of the electric field by the suppressor and the advantages of using the suppressor.

The characteristics of the threshold voltage and current-voltage (I-V) were observed under the varying extracting voltage with floated suppressor voltage, and under the varying suppressor voltages with fixed extractor voltage.

We also simulated LMIS with the suppressor through CST(Computer Simulation Technology). The emission current increases as the suppressor voltage decreases because the suppressor voltage which restrains the electric field goes down, The threshold voltage increases as the suppressor voltage increases. We can explain characteristics and functions of LMIS with a suppressor using the electric field.