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Development of Ion Beam Source Test Bench with Beam Diagnostics for Ion Implantation Applications

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Ion implantation, a key step in advanced processes, requires both low-energy, high-current beams for shallow source/drain doping and high-energy beams for deep junction formation necessary for power devices or long-wavelength CMOS. To address this wide range of energy and current needs, it's become crucial to develop various ion implanters. This study focuses on creating a test bench to compare different ion sources, improve their performance, and find optimal operating conditions. A Faraday cup array (FCA) and an Allison scanner are used for the quantitative evaluation of beam characteristics. This study analyzes the design considerations for the FCA and Allison scanner used in the test bench, as well as the effects of plasma density, extraction voltage, and inter-electrode distance on beam characteristics.

Paper submission Plan

Yes

Best Presentation

Yes

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