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A Compact 2.45 GHz Microwave Ion Source and Associated Wien Filter Based Analyzing System for Low Energy Ion Beam Facility

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A high flux, low energy ion beam facility has been designed, developed and commissioned at the Inter University Accelerator Centre (IUAC), New Delhi. [1, 2]. It mainly consists of a 2.45 GHz microwave ion source, a compact multi-electrode extraction system and an experimental chamber for performing experiments using intense ion beams in the energy range of a few keV to a few tens of keV. Various kinds of experiments have been carried out related to studies in materials sciences and plasma physics. The facility is planned to be upgraded using a compact Wien filter with a mass resolving power (m/m) of ˜ 200, assuming slits are positioned at a distance of 100 mm from the exit of the filter. The Wien filter will transmit ions with velocities ranging from 0.97 x 10^5 m/sec to 13.83 x 10^5 m/sec. The results of beam optics simulations, the detailed design of the Wien filter and beam transport system will be presented.

References

[1] N. Kumar, G. Rodrigues, Y. Mathur, S. Ohja, R. Ahuja and D. Kanjilal, Vacuum 124, 55-59 (2016).

[2] N. Kumar, G. Rodrigues, P. S. Lakshmy, R. Baskaran, Y. Mathur, R. Ahuja and D. Kanjilal, Rev. Sci. Instrum. 85, 02C103 (2014).

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