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H- Beam Emittance Simulations Using IBSIMU Code in a Multicusp Ion Source

Ion beam extraction simulation codes like IBSimu use approximative models for predicting the size and location of the plasma sheath inside an ion source. The plasma sheath has a strong focusing effect in the formation of an ion beam from the plasma. Emittance of the extracted beam depends on the shape and location of the plasma sheath inside the ion source. In the present study, the variation in H^- beam emittance values under different plasma conditions are determined from D-Pace's TRIUMF licensed filament-powered ion source and University of Jyväskylä licensed RF-powered ion source. Ion beam extraction from the plasma is simulated using IBSimu code also and the emittance results obtained are compared to the experimental results. Variation of beam emittance under different electric fields, plasma densities and gas pressures are analysed.

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