

### **CRISP: A compact RF ion source prototype for emittance scanner testing**

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Abstract:

A movable Allison type emittance scanner is being developed to characterize the phase-space distribution of Source for the Production of Ions of Deuterium Extracted from RF plasma, the prototype RF negative ion source of the ITER heating neutral beam injector. To test the electronics and verify the capability of the device to resolve nearby beamlets, a compact RF ion source prototype has been set up, capable of accelerating 1 mA of helium ions up to a voltage of 2 kV. A commercial 100 W RF generator creates a plasma inside a Pyrex tube, with a density between  $10^{15}$  and  $10^{16} \text{ m}^{-3}$  and an electron temperature up to 15 eV. Three multi-aperture grids in accel-decel configuration extract and accelerate the ions, which are measured with a Faraday cup. We present in this paper the characterization of the ion source and its first operation, showing that it is suitable for the commissioning of the Allison scanner.