The effect of microwave power on the intensity of the Ar^{9+} and Ar^{13+} optical emission and ion beam current in ECRIS

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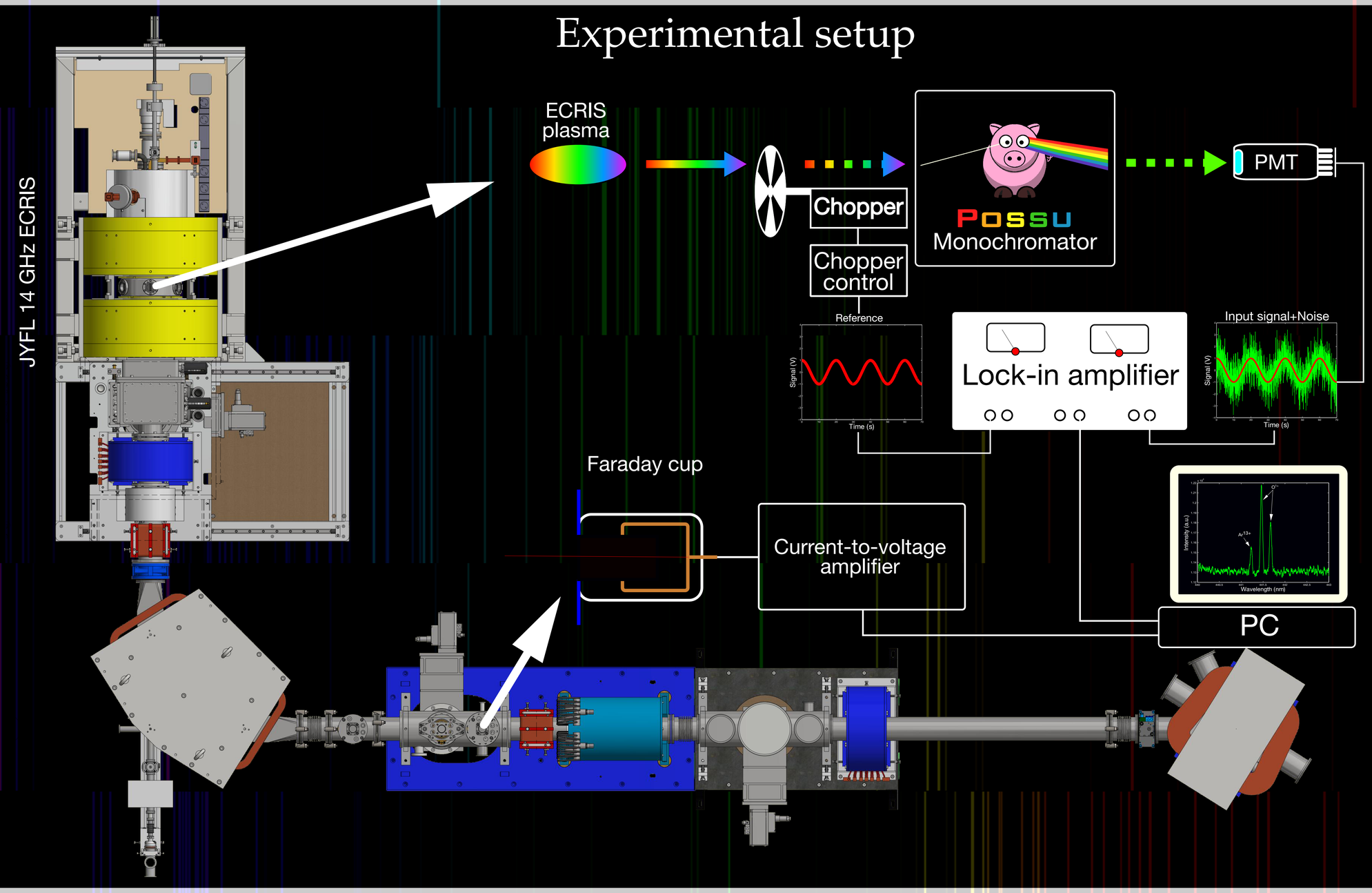
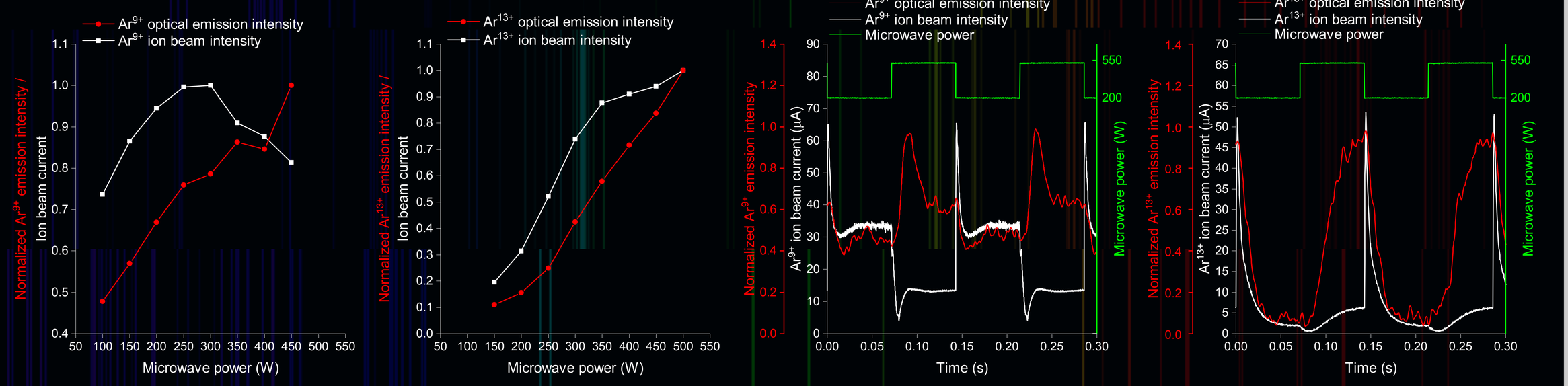
The intensities of the ion beams extracted from electron cyclotron resonance ion sources (ECRIS) depend on the production rate of ions, their destructive processes and the efficiency of the ion beam formation and transport.

Is there a correlation between high charge state ion optical emission intensity from the plasma core and the extracted ion beam currents as a function of microwave power?

Experimental setup



Results



The relative change of the ion beam current as a function of the microwave power does not necessarily follow that of the optical emission. The observations support the conclusion that diffusive processes and electrostatic confinement are the most probable cause for limiting the extracted currents at high microwave power.

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