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Use of a 2.45 GHz ECR ion source for the Neutron Target Demonstrator project

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D-Pace has licensed a 2.45 GHz ECR ion source from Neutron Therapeutics. The ion source will be used for the Neutron Target Demonstrator project at Los Alamos National Laboratory where 10 mA of singly charge krypton ions at 50 keV are required with a normalized 4-RMS emittance of less than 1 mm·mrad. The goal of the project is to create a reverse kinematics neutron capture reaction with ^{84}Kr ions. Due to the high radiation environment that the ion source will be subjected to, a solid state microwave power supply will be used instead of the traditional magnetron for the experiment. The main advantage of the solid state power supply is that the output is transmitted by a coax cable instead of a waveguide, so the power supply can be located a long distance away from the ion source without the need for a complicated and expensive waveguide. The other advantage of the solid state device is that the frequency can be varied from 2.4 GHz to 2.5 GHz. This gives the operator an extra degree of freedom for tuning the ion source and also allows for the use of permanent magnets instead of solenoids while still having the ability to tune the ECR condition. We present how the frequency variation affects the beam parameters with both the solenoid and the permanent magnet versions of the ion source.

Footnotes

Funding Agency

I have read and accept the Privacy Policy Statement

Yes

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