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X-Ray Diagnostics of ECR Ion Sources

Friday, 22 September 2023 11:30 (30 minutes)

ECR (Electron Cyclotron Resonance) Ion Sources (ECRIS) are widely used to provide highly charged heavy ions for high energy accelerators. In their plasmas, ECRISs are able to generate electron population having enough high energy to effectively ionize the atoms up to their inner shells. The quality (intensity, emittance, stability) of the ion beam used by the end-stations of the accelerators is strongly determined by the general plasma conditions, therefore plasma diagnostics techniques were implemented and developed during the more than 50 years colorful history of ECRISs. One of the most commonly used non-destructive diagnostic methods is based on the investigation of spectral and/or spatial distribution of the X-ray photons emitted by the plasma and plasma chamber complex. The interaction of warm and hot electrons with the plasma atoms, ions and plasma chamber walls results intense X-ray emission and by applying X-ray plasma diagnostic technics meaningful, quantitative plasma parameters (density, temperature) can be revealed. During my talk I will go through the main features of the ECRIS related X-ray measurement techniques in the context of their contribution to the understanding of ECR Ion Sources.

Funding Agency

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I have read the Code of Conduct to attend ICIS2023.

Presenter if not the submitter of this abstract

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