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High intensity ion source activity at CEA

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CEA Paris-Saclay has been engaged in the development of high-intensity proton sources since the early 1990s, beginning with the SILHI ECR ion source, designed to inject beam into the IPHI accelerator. Still in operation today, SILHI has demonstrated long-term stability and reliability. To improve compactness and ease of maintenance, a redesign of the plasma chamber was initiated. This effort led in 2012 to the creation of ALISES, a prototype that marked the start of a new modular and scalable ECR source family, with multiple evolutions under study. The R&D program has since grown to include both experimental and simulation-based investigations. Recent developments feature for instance the integration and testing of a solid-state RF power amplifier as a replacement for the traditional magnetron on the BETSI test bench. Also, numerical simulations of plasma generation, RF coupling and extraction system are on-going to improve the ECR design thanks to new advanced optimization techniques that are being developed at CEA. This contribution summarizes the choices done for the development of ion sources as well as the recent R&D studies performed on these sources at CEA Paris-Saclay.

Footnotes

Funding Agency

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Yes

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