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Research of CB ECRIS plasma with the aid of injected 1+ beam

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An anomalous global efficiency of the extracted 1+ beam was discovered at the LPSC charge breeder. It was realized that a fraction of injected 1+ beam propagates through the charge breeder plasma without being captured and ionized. As a result of the further experiments and theoretical considerations it was realized and confirmed that 1+ beam injected into the charge breeder plasma can be used as a plasma diagnostics tool. Identification of the uncaptured fraction of the 1+ ions allow, for example, estimating the ion-ion collision mean free path of injected 1+ beam and plasma densities as a function of microwave power. The presentation will describe in more detail the injected 1+ beam as a diagnostic tool to reveal information about different plasma parameters. Further more, the prospects to use charge breeder ECRIS to study the effect of gas mixing on the ion confinement time will be discussed.

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