

Positron accumulation in ultra high vacuum with an electron plasma

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Various techniques for trapping positrons have been intensively developed in the last decades including slowing down via collisions with buffer gas [1] and by field ionization of Rydberg positronium atoms [2], etc., since such techniques are expected to open new fields of research.

We recently developed a new positron accumulation scheme, in which trapped electrons are used as an energy absorber for positrons [3]. The positron accumulation efficiency normalized by Na-22 positron source intensity is 10^{-5} (e^+/β^+), which is the result of several steps such as (1) solid Ne moderator efficiency to produce slow positrons (~0.2%), (2) transport efficiency of slow positrons into the trap (~50%), and (3) capturing efficiency of slow positrons in a trap (~1%).

We will discuss the present status and possibilities to further improve the efficiency.

References

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