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Development and characterization of microscopic liquid droplet internal target beams

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The use of internal targets is a powerful method to investigate fundamental atomic and nuclear processes in a storage ring. We will present here the recent advances in the development of high density internal targets from a microscopic liquid droplet beam, by focusing on their characterization by using highly charged ions (HCI) in a storage ring. In particular, we will show that a liquid droplet target beam virtually behaves like a homogeneous gas jet target with respect to both energy loss and ion beam cooling. We will also present a first quantitative study on the cooling efficiency of HCI interacting with a dense hydrogen target. Major drawbacks of a liquid droplet target beam will be discussed, and possible current valid alternatives presented.

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