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Intense Afterglow Beam Production and Manipulation

High intensity afterglow beams have been produced with SECRAL-II ion source under double frequency heating (24 + 18 GHz) recently. At a total microwave heating power of up to 8 kW, high intensity ion beams such as 266 μA of Xe^{34+} and 169 μA of Xe^{38+} have been produced. In this experiment, we have tried high power double frequency heating, and also changing of the temporal synchronization between the two microwave sources, which was found to have impact not only to the afterglow peak currents, but also affect afterglow peak waveform. Specifically, a delay of the end time in the secondary microwave (18 GHz in our case) can decrease the pulse width of beam peak obviously. Overall, this work provides new possibilities for the application of afterglow beams in terms of high peak currents of highly charged ion beams and flexibility in pulse duration.

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