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Simulation Study on Nanosecond Laser Ion Source

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The Laser Ion Source (LIS) can easily produce high charge state and high intensity ion beams, especially the refractory metallic ion beams, so it is a promising candidate as an ion source for heavy ion cancer therapy facilities and a future accelerator complex, where a pulsed ultra-intense and high-charged heavy ion beam is required. Due to the capability of LIS to produce high-brightness ion beams, single turn and single-pulse injection mode for a synchrotron could be realized. Experimental research activities on laser ion sources had been carried out in many laboratories around the world. However, there are still many physical mechanisms of LIS that need to be studied by simulation.We have systematically studied the influence of different laser parameters on the LIS with simulation.The distribution of electrons and ions was obtained by simulation. The simulation is in general agreement with the results of experiments. The initial distribution of the laser ablation plasma is obtained, which provides parameters for further research.

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Footnotes

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Yes

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