

ACCELERATION OF IONS USING ULTRA-THIN TARGETS WITH THE BELLA LASER

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We have carried experiments using the 40 fs HERCULES laser at intensity 3×10^{20} W/cm² with sub-micron Si₃N₄ and pure metal foils. The data shows that the ion species distribution transitions from low ionization states of protons and carbon to high ionization states of carbon and substrate ions such as Si 12+ when the thickness is reduced incrementally from 1300 nm to 50 nm. The change in thickness also results in dramatic increase in maximum energy and particle number. The ion beam generation characteristics were improved for thicknesses 50-150 nm. We have used similar target parameters for the Bella laser to predict the ion beam properties. The results will be presented at the meeting.