Laser impact on metals in the UV regime results in a significant number of ablated plume ions even at moderate fluence (0.7–2.4 J/cm²). The ablated particles are largely neutrals at the lowest fluence, but the fraction of ions increases strongly with fluence. The ion flow in different directions from a silver target irradiated by a laser beam at a wavelength of 355 nm in vacuum was measured with a hemispherical array of Langmuir probes. The time-of-flight spectra in all directions, as well as the total angular yield were determined. The angular distribution peaks strongly in forward direction with increasing fluence and can be well approximated by Anisimov’s model. Typically, the spectra of silver ions peak from 70 eV up to 145 eV in a direction close to the normal of the target surface with increasing fluence. With increasing observation angle, the time-of-flight spectra exhibit a peak at longer flight times, i.e., at a lower kinetic energy. At the highest fluence, the ionized fraction of the ablated particles in the plume increases up to 0.5.
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