

Abstract Submitted
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Ion energy and angular distributions on surfaces delivered by plasma jets and dielectric barrier discharges.¹ NATALIA BABAEVA, GEORGE NAIDIS, EDUARD SON, Joint Institut for High Temperatures RAS — The information on typical values of ion energy and angular distributions (IEADs) on surfaces delivered by plasma jets and dielectric barrier discharges (DBDs) is equally important for the plasma processing and plasma medicine. The therapeutic effects of application of DBDs and jets in plasma medicine are partially attributed to energetic ions impinging on surfaces. In this paper, we report on results from a computational investigation of the IEADs for atmospheric pressure plasmas. The two-dimensional nonPDPSIM modeling platform is used in which IEADs are computed using Monte Carlo techniques. We compare two plasma sources - DBDs and plasma jets - and show that (i) when using a DBDs source, ions with high energies can be delivered to surfaces, (ii) while IEADs produced by plasma jets are characterized by much smaller energies. In particular, we demonstrate that ionization wave (IW) in plasma jets of positive cycle or pulse produce ion energies of a few eV while for the negative IW the ions are almost thermalized. The dependence of IEADs on the underlying material is also discussed.

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