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Spatial Emission of Ions Produced by the APF Plasma Focus Device

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Abstract : The angular distribution of ion beam emission from the APF plasma focus device (15kV, 40μf, 115nH) filled with nitrogen gas has been examined through investigating the effect of ion beams on aluminum thin foils in different angular positions. The samples are studied in different distances from the anode end with different shots. The optimum pressure that would be obtained at the applied voltages of 12kV was 0.7 torr. The ions flux declined as the pressure inclined and the maximum ion density at 0.7 torr was about 10.26 × 1022 ions/steradian. The irradiated foils were analyzed with SEM method in order to study their surface and morphological changes. The results of the analysis showed melting and surface evaporation effects and generation of some cracks in the specimens. The result of ion patterns on the samples obtained in this study can be useful in determining ion spatial distributions on the top of anode.

Keywords : plasma focus, spatial distribution, high energy ions, ion angular distribution
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