

ThuPS35

High Speed Photography Diagnostics of a Miniature Vacuum Arc Ion

Source

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Vacuum arc ion sources can produce intense metal or nonmetal ions with different charge states, which have been widely used in many areas such as ion implantation, acceleration injection, space propulsion. In this paper, a miniature vacuum arc ion source designed for a compact and movable neutron generator is introduced. To investigate the rise time and spatial distribution of discharge during arc initiation, a high speed multiframe camera is employed, which is capable of taking eight images during one shot. Two different triggering methods including the resistance triggering and independent pulse generator triggering are compared through high speed photography diagnostics. The results clearly show the process of arc initiation. The advantages and disadvantages of each triggering method are also discussed in detail.