

# ABSTRACT

In an ion source, a rear reflector 10 is electrically insulated from both a plasma production vessel 2 and a filament 6. The rear reflector 10 and an opposed reflector 8 are electrically connected. Further, a DC bias power supply 32 is a power supply individuated from a filament power supply 24 and an arc power supply 26. The DC bias power supply 32 is placed for applying a bias voltage  $V_b$  between the opposed reflector 8 and the rear reflector 10 and the plasma production vessel 2 with both the reflectors 8 and 10 as negative potential.