

ABSTRACT

BROAD BEAM FLUX DENSITY CONTROL

An ion beam source (10). The source includes multiple apertures (31) bounded in close proximity by an extraction electrode (34) for extracting positively charged ions from the source. Ions exiting the source combine downstream to form a broad beam (14) which, in one utilization of the invention, is used for ion beam treatment of a silicon wafer. Individual electrodes (40) in close proximity to the extraction electrode can be biased to either inhibit or allow backstreaming of neutralizing electrons from beam portions close to the source back to the extraction electrode. This allows the beam portion to become denaturalized and, therefore, unstable. The unstable beam is diminished in intensity since positively charged ions within that beam portion exit the beam. An isolation plate (50) separates beam portions in close proximity to the extraction electrode to inhibit beam crosstalk and an additional suppression electrode (70) common to all beam portions is controllably biased to further enhance control over beam portion intensity. In a typical application, the beam is a circular beam and intensity control is maintained to assure common intensity for a given radii from the beam center.

(Figure 1)