

# Origin of beam non-uniformity in a large Cs-seeded negative ion source

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The origin of the beam non-uniformity, that is one of the key issues in large Cs-seeded negative ion sources for JT-60U and ITER, was experimentally examined by measuring correlations between the intensity of the  $H^-$  ion beam and plasma parameters such as an electron temperature and plasma density in the JAERI 10 A negative ion source. The ion source was seeded with a small amount of cesium to enhance the negative ion production. The spatial distribution of the beam intensity was non-uniform, and was absolutely different from that before seeding cesium. From the correlation between the beam intensity and the plasma parameters, it was foreseen that the beam non-uniformity was due to the localization of the plasma and/or  $H^0$  atoms caused by  $B \times \nabla B$  drift of the fast electron from filaments. The filament position was modified to suppress the  $B \times \nabla B$  drift, and then the spatial uniformity of the beam intensity was examined. By this modification, the root-mean-square of the spatial beam intensity decreased to the half of that before modification while the beam intensity integrated along the longitudinal direction was kept to be constant. From this result, it was confirmed that one of the origin of the beam non-uniformity was caused by plasma localization.

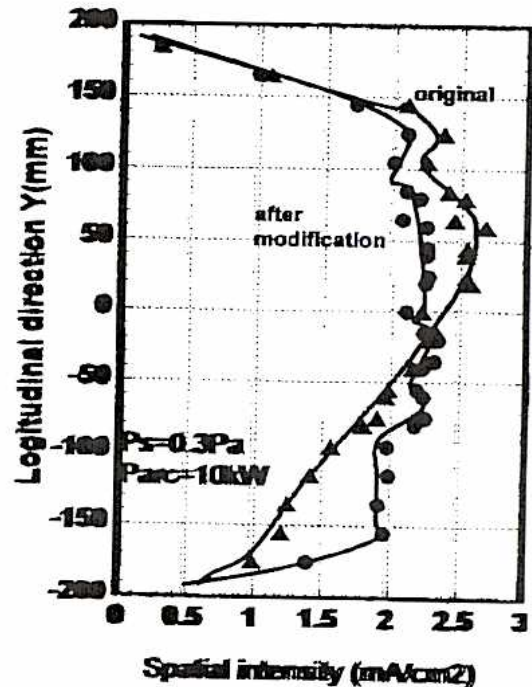


Figure Beam profiles before and after modification of filament position.