

## Selective removal of helium by ICR heating in sheet plasma

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The pumping of helium ash has become important for the control in the edge plasma of the divertor because of the helium ash has limit of concentration. It has been shown that the end loss from the line cusp can be plugged effectively when an RF field near the ion cyclotron frequency is applied at the line cusp [1]. Also, the methods to improve the helium removal performance of a pump limiter by using a RF ponderomotive force (RF-filter) were presented [2]. The selective removal of helium ash using by ion cyclotron resonance (ICR) method has been studied in a linear divertor simulator, TPD-SheetIV [3]. We have demonstrated the ICR method of the helium or helium/hydrogen sheet plasma by the RF electrodes of two parallel plates, sandwiching the plasma. Measurements of the ion temperature in the plasma were carried out a fast scanning Faraday cup. In addition, the ion densities in the plasma were measured by an omegatron mass analyzer and the neutral densities of resonant ions was measured by a quadrupole mass analyzer. As a result, the resonance frequencies  $f_{RF}$  is slightly higher than the ion cyclotron frequency of helium  $f_{ci}$ . The ion densities of  $He^+$  rapidly decrease with increasing the RF power, although  $H^+$  and  $H_2^+$  gradually decrease. It is found that the selective removal of the helium ions in the sheet plasma is successful by ICR method.

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