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## On the Effect of Biased Surfaces in the Vicinity of the Extraction Area at the Large RF Driven Negative Ion Source at the ELISE Test Facility

The ion source at the ELISE test facility is an intermediate step towards the operation of the ITER source and demonstrates fulfillment of the ITER NBI requirements in hydrogen (H). However, in deuterium (D) operation the co-extracted electron current ( $I_e$ ) is higher and limits the source performance. In the standard setup of ELISE,  $I_e$  is reduced by a positive potential applied to the plasma grid (PG) with respect to the source body and the bias plate (BP). To further reduce and stabilize  $I_e$  in D, alternative schemes by biasing the BP are investigated. Measurements of the BP currents and of the extracted currents, combined with probe diagnostics in the vicinity of the PG for D operation and short pulses are presented. Biasing the BP, leads to a change in the distribution of the plasma potential in front of the extraction area, affecting the charged particle fluxes towards the BP and the PG and a reduction of  $I_e$ . This gives an outlook for stabilizing  $I_e$  of the ITER NBI systems.

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