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A comparison of inflection point and floating point emissive probe techniques for electric potential measurements in a Hall thruster plasma J.P. SHEEHAN, University of Wisconsin - Madison, YEVGENY RAITSES, Princeton Plasma Physics Laboratory, NOAH HERSHKOWITZ, University of Wisconsin - Madison, NATHANIEL FISCH, Princeton Plasma Physics Laboratory — Theory suggests that when increasing the electron emission of an emissive probe the floating potential will saturate $\sim T_e/e$ below the plasma potential. This can introduce significant errors in plasma potential measurements in Hall thrusters where $T_e > 10$ eV. The method of determining the plasma potential from the inflection point of emissive IV traces in the limit of zero emission may give a more accurate measurement of the plasma potential. The two methods are compared in a Hall thruster where $n_e \sim 10^{11}~{\rm cm}^{-3}$, $T_e \sim 20~{\rm eV}$, and ion flows are significant. The results can be generalized to other types of plasmas.

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