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A comparison of ion velocity measurements from retarding field energy analyzer (RFEA) and laser induced fluorescence (LIF) in expanding helicon plasma NJÅL GULBRANDSEN, ÅSHILD FREDRIKSEN, University of Tromsø, JERRY CARR JR., EARL SCIME, DUSTIN W. MCCARREN, ROBERT VANDERVORT, MATTHEW E. GALANTE, RICHARD M. MAGEE, GREG LUSK, STEPHANIE H. SEARS, West Virginia University, WOJCIECH J. MILOCH, University of Oslo — We present a comparison of ion velocity measurements from RFEA and LIF where we specially focus on the ability to diagnose flow and ion beams due to current free double layers in expanding helicon plasma. An RFEA in a plasma will be surrounded by a sheath so the velocities measured by the RFEA will be the velocities of the ions after they have been accelerated by the sheath and any potential drops inside the probe. Different methods exist to relate the velocities measured by the RFEA to the velocities in the plasma. Most of them include some simple assumptions about the acceleration in the sheath. We will compare measurements from two different RFEAs, one with a grounded front grid and one with a floating front grid, with LIF measurements to assess the validity of these simple models.

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