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**A new method to find the electron distribution function from cylindrical probe data** SCOTT KNAPPMILLER, SCOTT ROBERTSON, ZOLTAN STERNOVSKY, University of Colorado, Boulder, CO — Druyvesteyn's method finds the distribution of electron speeds from the second derivative of probe data using the assumption that the distribution is spherically symmetric. For the disk probe, the data are more directly related to the velocity distribution projected onto the direction normal to the probe surface. The projected distribution is less sensitive to noise because it is related to the first derivative of the disk probe data rather than the second. For the cylindrical probe, the data are more directly related to the distribution of energies projected onto the plane perpendicular to the probe axis. A method is developed for recovering this projected distribution from digitized probe data. The method is mathematically more complex than Druyvesteyn's method, but has the advantage of being less sensitive to noise. The methods are compared using noise-free simulated data and using noisy data from a double-plasma device with multidipolar magnetic confinement.

Scott Robertson
University of Colorado

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