

Abstract Submitted
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Study of the error associated with background variations during active CXRS analysis¹ KENNETH MARR, BRUCE LIPSCHULTZ, RACHAEL MCDERMOTT, PSFC — Analysis of active charge-exchange spectroscopy requires a knowledge of background emission from times for which the beam source is inactive. The intensity of this background emission can vary during a shot, even for 'constant' plasma conditions, leading to uncertainties in its subtraction during beam-on periods. We present a study wherein we use an incorrect background emission during analysis to see the effect on derived velocity and temperature. Assuming an error of up to 10% in the background total counts and a signal to background ratio of 1.5, we obtain up to 4 km/s error in ion velocity and 20 eV in temperature for a test signal that was originally 30 km/s and 400 eV. The error is consistent with expectations due to the relative positions of the two line shapes. As expected, the error (in both temperature and velocity) decreases with increased signal to background ratio. These errors will combine with the uncertainty introduced by photon noise.

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