

Abstract Submitted
for the APR13 Meeting of
The American Physical Society

The impact of the phase-space density on the detection of dark matter¹ DANIEL HUNTER, FRANCESC FERRER, Washington University in St. Louis — Fluxes from dark matter annihilation depend on the square of the density, but they also depend on the velocity distribution. For many halo models this cannot be found analytically, and a Maxwell-Boltzmann distribution is often used for the particle velocity in lieu of the correct distribution. However, this is correct only for an isothermal sphere. Furthermore, the shape of the velocity distribution changes throughout the halo. We numerically compute the correct velocity distribution for several halo models and compare luminosity predictions with those found using a Maxwell-Boltzmann distribution. In many cases, the Maxwell-Boltzmann distribution is reasonable, but in others, especially when observing the galactic center, it significantly underestimates the luminosity, implying that the true constraints on dark matter models may be more strict than previously thought.

¹This work was supported in part by the U.S. DOE under Contract No. DE-FG02-91ER40628 and the NSF under Grant No. PHY-0855580.

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Date submitted: 11 Jan 2013

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