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Systematic uncertainties in dark matter searches due to halo asphericity

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We study the impact of aspherical dark matter density distribution in Milky-Way like halo on direct and indirect searches. Using data from large N-body cosmological simulation Bolshoi, we perform a complete statistical analysis and quantify the systematic uncertainties that affect the determination of local dark matter density and J factors for annihilating and decaying dark matter. We find that the systematic effects can be as large as 50% at 95% CL for a spherically averaged local density of 0.3 GeV/cm^3 . Similarly, systematic uncertainties for J factors evaluated around the galactic center can be as large as 20% and 15% at 95% CL for decaying and annihilating dark matter, for typical NFW profiles.

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