Further References

I. ANALYSIS OF THE FURTHER REFERENCES

For a local DM distribution, the spin-independent [6] cross-section for the scattering of a proton on a WIMP σ_I for our Galaxy is evaluated as

$$\sigma_I = \left(\frac{\mu_{\chi A}}{\mu_{\chi p}}\right)^2 A^2 \frac{4}{\pi} \mu_{\chi p}^2 f_p^2 \tag{1}$$

with $\mu_{\chi p}$ the WIMP-proton reduced mass, and f_p the total spin independent cross section. The energy spectrum is demonstrated to depend only on an integral over the WIMP-speed distribution, and not on its shape. From [7], the recoil energy transferred in a collision between an incident particle of mass m and velocity v an item of target composed of nuclei of mass M depends upon the scattering angle θ.
The directional recoil momentum spectrum can therefore be evaluated for relativistic particles as

$$\frac{dR}{d\hat{\phi}} = \int_{\hat{\theta}_{min}}^{\hat{\theta}_{max}} d\cos\hat{\theta} \int_0^{v_{esc}} dvd\cos\hat{\theta}(1-\cos\theta)F^2[E_R]f(v_{min,\quad i,\hat{q}})m_0c^3\left[arctan(\hat{\gamma})-\hat{\gamma}\right], \tag{2}$$

with $\hat{\phi}$ and $\hat{\theta}$ the angles evalated for the target at rest in the laboratory system and the halo of our Galaxy.

For galaxies with cosmological cusps, analytic and anisotropic distribution functions can be evaluated [9] after the distribution functions found in [10] [11] for the anisotropy distribution function β,

$$f(E,L) = L^{-2\beta} f_E(E) \tag{3}$$

where $f_E(E)$ a function of the binding energy, the anisotropy β defined as

$$\beta = 1 - \frac{<v_T^2>}{2<v_r^2>} \tag{4}$$

with $<v_T^2>$ and $<v_r^2>$ the radial velocity second moment and the tangential velocity second moment, $L = r\nu_T$ the specific angular momentum with ν_T the two-dimensional velocity component projection on the tangential plane.
For the superposition of different anisotropy schemes, the distribution function can be separated in different summands

$$f(E,L) = L^{-2\beta_i} f_{i\quad E}(E) \tag{5}$$

For extreme radial anisotropy ($\beta \to 1$) in the outer parts, distribution functions can be separated as [5]

$$f = g(E)h(L/L_c(E)), \tag{6}$$

with L_c the angular momentum of a circular orbit with energy E.

The comparison of observational data with theoretical schematizations of galactic halos with varying radii has been accomplished in [12] the distribution function can be hypothesized as
The effects of anisotropy in Galaxy formation has been analyzed in [2] as far as the projection on the equatorial plane of the star motion is concerned by numerical methods.

The behaviour of anisotropic distributions of satellite galaxies populations has been analyzed in [4], where the effects of polar anisotropies have been taken into acccount according of two different possibilities, i.e. either the anisotropy is contained in the initial conditions for the EFE's, or arising after symmetric initial conditions.

An anisotropic velocity dipersion for spherical galaxies has been examined in [8], for the numerical integration of anisotropic dispersion profiles.

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