DARK MATTER

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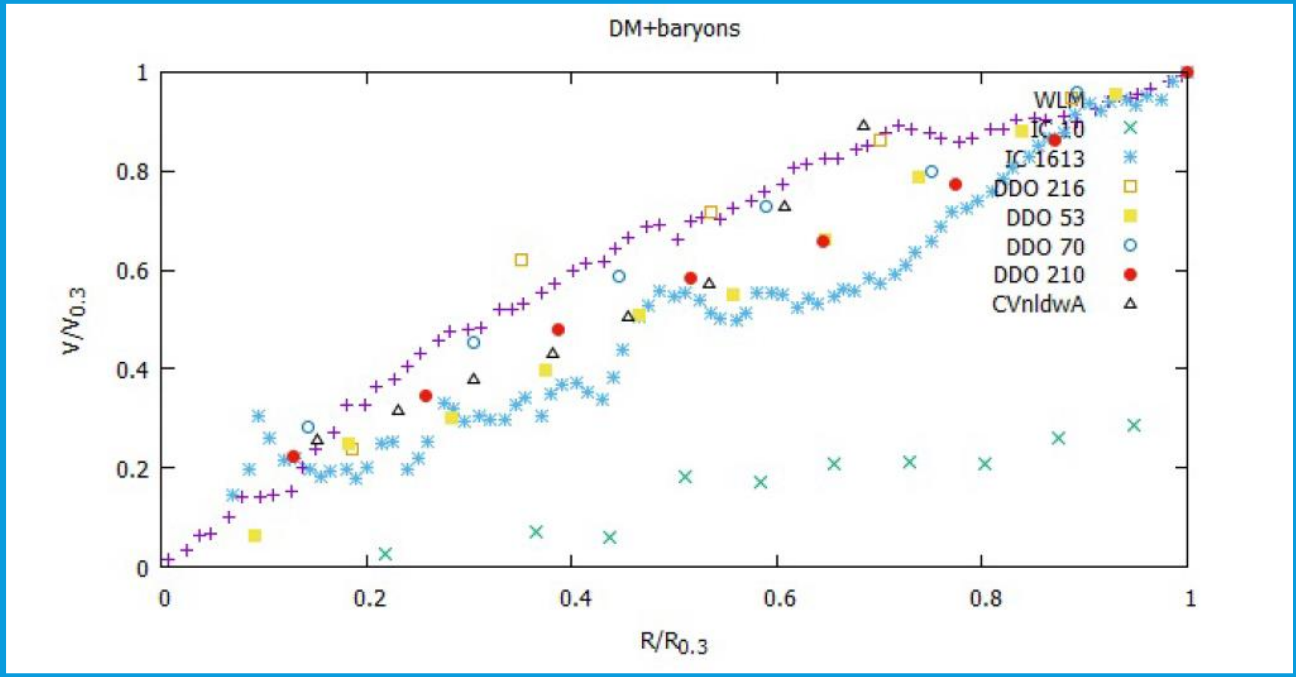
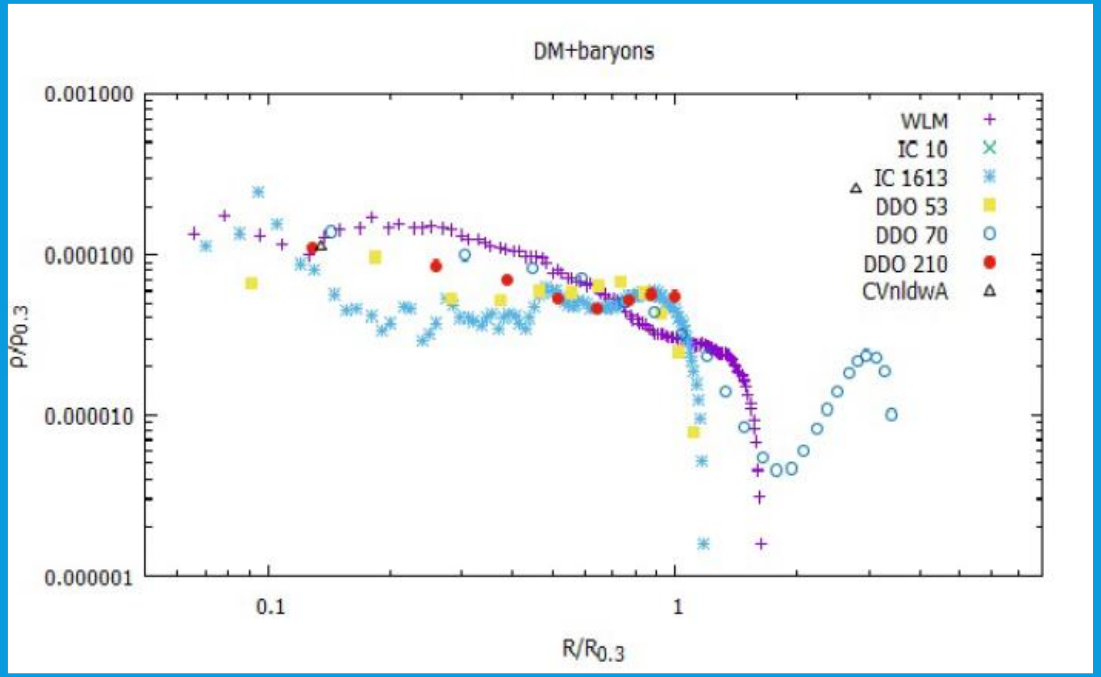
OUTLINE

- Previous works
- Future works
- Dark matter profiles

PREVIOUS WORKS





The rotation curves and dark matter density profiles using data from the LITTLE THINGS survey

DARK MATTER HALO PROFILES

- ISO profile

$$\rho_{ISO}(R) = \frac{\rho_0}{[1 + (R/R_c)^2]},$$

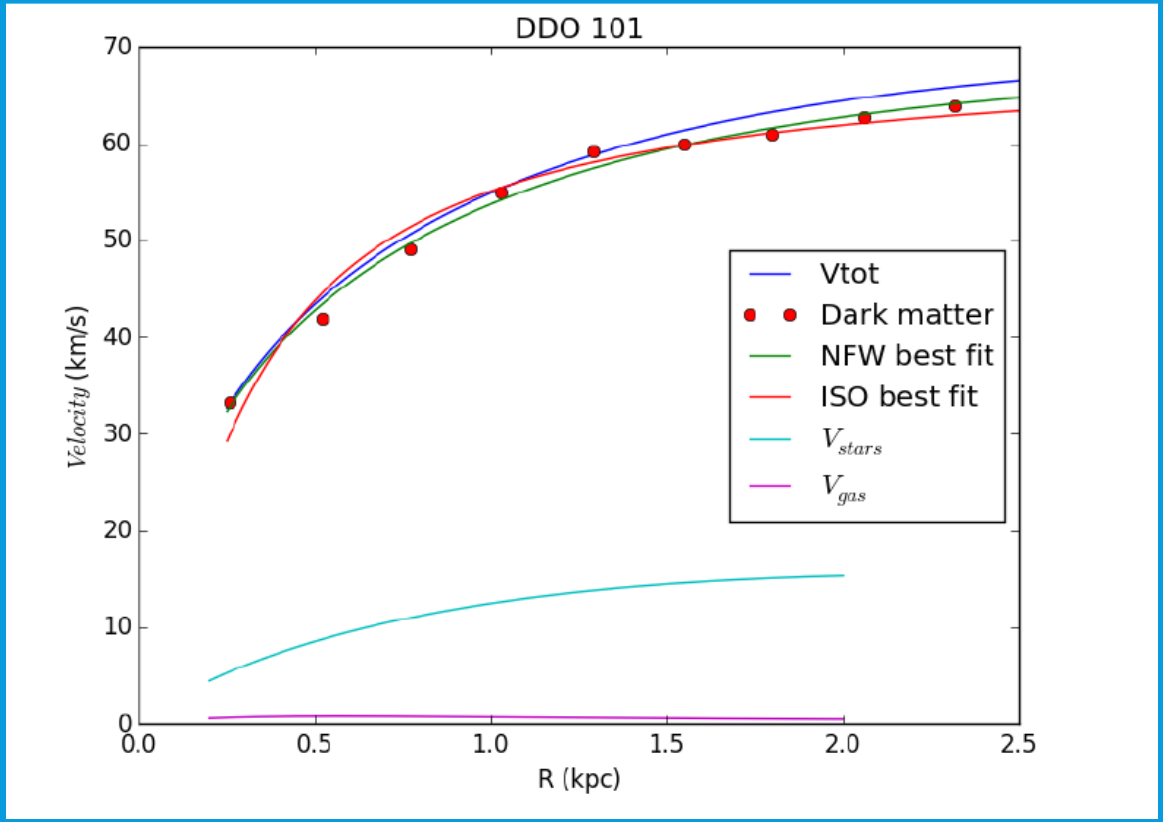
$$V_{ISO}(R) = \sqrt{4\pi G \rho_0 R_c^2 \left[1 - \frac{R_c}{R} \arctan(\frac{R}{R_c})\right]},$$

- NFW profile

$$\rho_{NFW}(R) = \frac{\rho_i}{(R/R_s)[1 + (R/R_s)]^2},$$

$$V_{NFW}(R) = V_{200}(R) \sqrt{\frac{\ln(1+cx) - cx(1+cx)}{x[\ln(1+c) - c(1+c)]}},$$

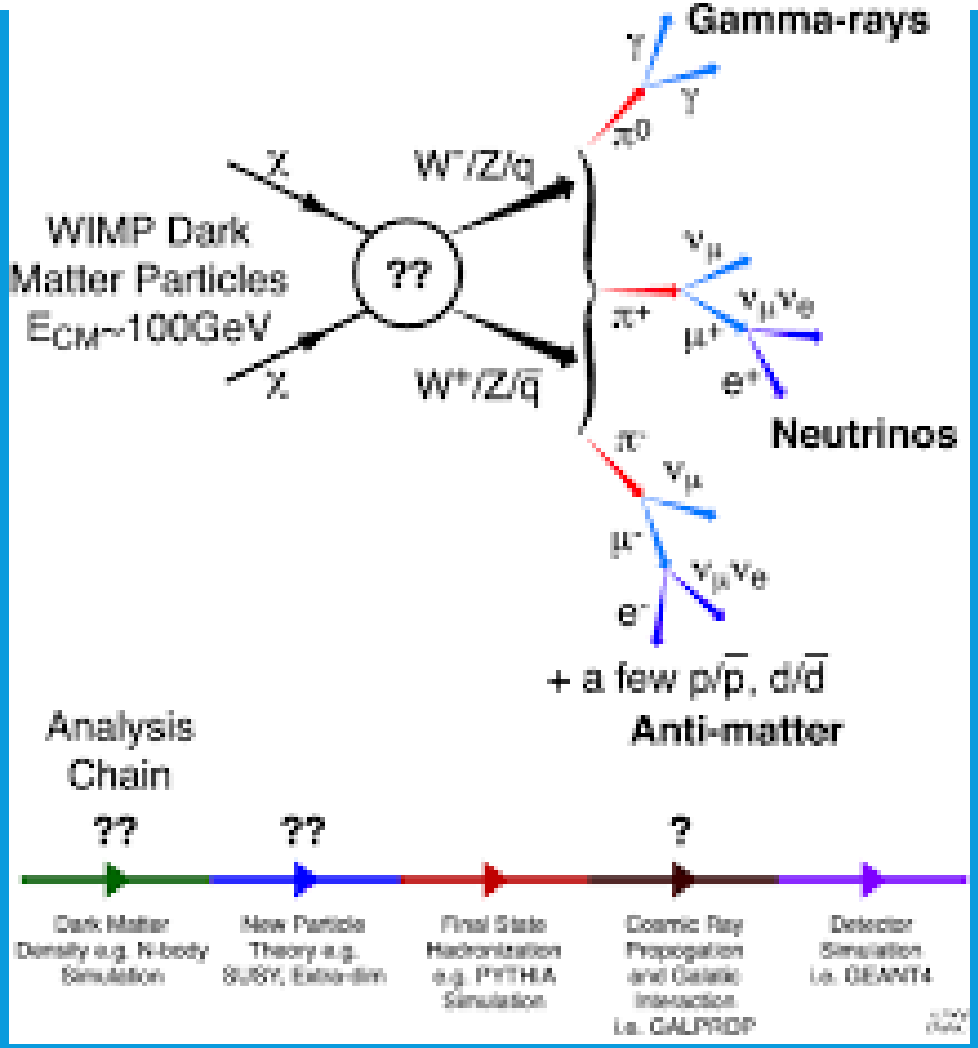
PREVIOUS WORKS



$$V_{obs}^2(r) = V_{gas}^2(r) + V_{stars}^2(r) + V_{halo}^2(r),$$

The rotation curve of DDO 101

FUTURE WORKS



DM annihilation

- Gamma rays channel
- The Milky Way
- Dwarf galaxies

DARK MATTER HALO PROFILES

$$\text{NFW}: \quad \rho_{\text{NFW}}(r) = \rho_s \frac{r_s}{r}\left(1+\frac{r}{r_s}\right)^{-2}$$

$$\text{Einasto}: \quad \rho_{\text{Ein}}(r) = \rho_s \exp\left\{-\frac{2}{\alpha}\left[\left(\frac{r}{r_s}\right)^{\alpha}-1\right]\right\}$$

$$\text{Isothermal}: \quad \rho_{\text{Iso}}(r) = \frac{\rho_s}{1+(r/r_s)^2}$$

$$\text{Burkert}: \quad \rho_{\text{Bur}}(r) = \frac{\rho_s}{(1+r/r_s)(1+(r/r_s)^2)}$$

$$\text{Moore}: \quad \rho_{\text{Moo}}(r) = \rho_s \left(\frac{r_s}{r}\right)^{1.16}\left(1+\frac{r}{r_s}\right)^{-1.84}$$