

## The dark matter doesn't exist (Saraiva)

Solar system:

Sun mass:  $M_s = 2 \times 10^{30} \text{ kg}$

Total mass of the solar system:  $M_T = 2.003 \times 10^{30} \text{ kg}$

The total mass is at the center.

$$v(R) = \sqrt{\frac{GM_s}{R}}$$

The radius increase, the mass remains constant, so the speed of rotation decrease.

Milky way:

Central black hole mass:  $M_H = 8.6 \times 10^{36} \text{ kg}$

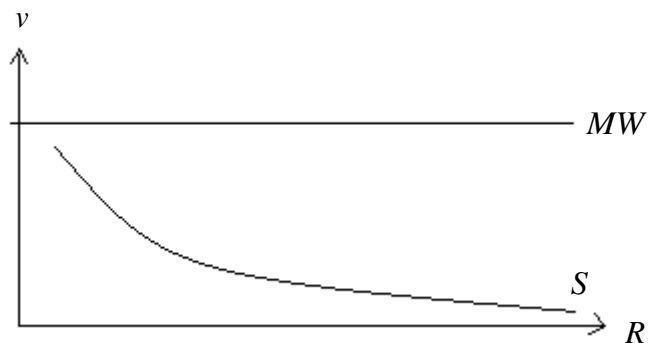
Total mass of the galaxy:  $M_G = 10^{42} \text{ kg}$

The mass increase with the radius, so the speed remains constant.

$$v(M, R) = \sqrt{\frac{GM(R)}{R}}$$

$$\frac{M(R)}{R} = 4.1 \times 10^{21} \text{ C} \quad ; \quad \text{Density: } \rho(R) = \frac{9.67 \times 10^{20}}{R^2} \text{ kg/m}^3$$

$$v(M, R) = 5.2 \times 10^5 \text{ m/s}$$



The content of “dark matter” is different for different galaxies, according to the type of distribution of the stars.