

## No evidence of galactic dark matter

For dark matter in an ordinary galaxy, I demonstrated that is not necessary to imagine matter black to explain the linear speed of rotation of the star the galactic disk.

I go deeper and find the topic for a gravitational law disk with the constant of proportion while considering the variation of density, for example by varying the density as the inverse radius  $R$  or varying as  $1/R$ , then I checked the law with the rotation curve of the galaxy Messier 33, for our galaxy, the overall effect of the bulb and the galactic disk is ensure that the velocity of rotation of the stars disk of our galaxy is nearly constant.

For details of demonstrations and checks, I suggest the article title and link are given below:

Explanation of the galactic rotation curve:

[http://www3.sympatico.ca/pierrejsavard/explanation\\_of\\_the\\_galactic\\_rotation\\_curve3.pdf](http://www3.sympatico.ca/pierrejsavard/explanation_of_the_galactic_rotation_curve3.pdf)

Summarize with a new format:

After the radius of the zone of constant density, after the bulb galactic or after or the radius of the area constant density of a galactic disk, we can express the area has constant density and the density in the following way:

or (radius of the area has constant density) =  $R_Z$ ,

let  $X = R/R_Z$  (here  $R$  is greater than or equal to the radius of the area  $R_Z$  constant density),

$R = XR_Z$ ,

or (density of the area has constant density) =  $d_Z$ ,

then after the area has constant density  $d_Z$  the density becomes:

$d = (d_Z) / X^3$  (equivalent density out of the area that has density constant of the bulb),

$d = (d_Z) / X$  (density of the galactic disk out of the area that has constant density),

Extremity to the area that has constant density is thus speeds  $V$  as follows:

$V = [\{4 (\pi) G / 3\} d]^{1/2} R$ , (for a sphere or a galactic bulge uniform density),

$V = [\{4 (\pi) G / 2\} d]^{1/2} R$ , (for the area of a galactic disk uniform density),

After the area has constant density  $d_Z$ , the tangential velocity of rotation  $V$  become:

$V = [\{4 (\pi) G / 3\} d_Z]^{1/2} (R_Z) (1 / X^{1/2})$ , (contribution of the bulb galaxy away from the galactic bulge),

$V = [\{4 (\pi) G / 2\} d_Z]^{1/2} (R_Z) X^{1/2}$ , (contribution of the disk away from the galactic zone has constant density),

Here we must consider the sum of the contributions of galactic bulge and the galactic disk, we see that the effect multiplier  $X^{1/2}$  of the galactic disk compensates the divider effect  $1 / X^{1/2}$  (or  $X^{-1/2}$ ) of the galactic bulge (In brackets the exponent  $1 / 2$  is negative), that is why the tangential speed of rotation of the stars

of  $V$  the disk of our galaxy are nearly constant.