

Theoretical proof that the gravitational acceleration is proportional to a mass per unit area

Consider the following law representing the gravitational acceleration:

$$(\text{Accé. gravi.}) = \text{Access. centrifugation.} = (V^2)/R = [4(\pi)^2 R[1/T^2]] = [4(\pi)G][(\text{mass})/(\text{surface})], \text{ (equation a),}$$

V is the speed of orbit and T is the Kepler period for a circular orbit, G is the gravitational constant, (π) is about 3.1416, accé. Gravi. for acceleration gravitational, accé. centrifugation. for the centripetal acceleration,

still consider here a uniform density, and the three following cases:
is the case of a sphere of radius R and mass equal to $d(\text{volume}) = d(4/3)(\pi)R^3$, equal to the surface $[4(\pi)R^2]$;

is the case of a disk of diameter 2R much larger than its thickness e, mass equal to $d[\text{volume}] = d[(\pi)R^2]e$, surface equal to $[2(\pi)R]e$;

is the case of a bar of length 2R much larger than its width and thickness, its width equal to its thickness, surface equal to $[2(\text{width})(\text{thickness})]$, mass equal to $d[\text{volume}] = d[(\text{width})(\text{thickness})(2R)]$;

By isolating the Kepler period T of the equation a, we obtain for the three following cases:

$$T^2 = (\pi)/(Gd), \text{ (case of a rotating galactic bar of uniform density), (Equation 1a),}$$

$$T^2 = 2(\pi)/(Gd), \text{ (case of a galactic disk of uniform density), (Equation 2)}$$

$$T^2 = 3(\pi)/(Gd), \text{ (case of a galactic sphere of uniform density), (Equation 3a),}$$

Let $\{T(\text{bar})\}^2$ be the (period)² of the Galactic bar, let $\{T(\text{disk})\}^2$ be the (period)² of the galactic disk,

Let $\{T(\text{sphere})\}^2$ be the (period)² of the galactic sphere, then we can write the equations 1a, 2a, 3a, as follows:

$$[(Gd)/(\pi)]\{T(\text{bar})\}^2 = 1, \text{ (Equation 1b),}$$

$$[(Gd)/(\pi)]\{T(\text{disk})\}^2 = 2, \text{ (Equation 2b)}$$

$$[(Gd)/(\pi)]\{T(\text{sphere})\}^2 = 3, \text{ (Equation 3b)}$$

To check the consistency of these three equations, additionons first three equations:

$$[(Gd)/(\pi)][\{T(\text{bar})\}^2 + \{T(\text{disk})\}^2 + \{T(\text{sphere})\}^2] = 1 + 2 + 3 = 6 \text{ (equation b),}$$

To check the consistency of this equation b, consider the special case where the density d is $6(\pi)/G$, this gives a density of galaxies to exaggerate, but one can imagine models reduces simply to check the consistency of this equation b for the density $d = 6(\pi)/G$, we have:

$$[G/(\pi)][6(\pi)/G][\{T(\text{bar})\}^2 + \{T(\text{disk})\}^2 + \{T(\text{sphere})\}^2] = 6, \text{ (equation c),}$$

$$[\{T(\text{bar})\}^2 + \{T(\text{disk})\}^2 + \{T(\text{sphere})\}^2] = 1 \text{ (equation c),}$$

according to the density we have chosen is $d = 6(\pi)/G$, equation 1b gives us $\{T(\text{bar})\}^2 = 1/6$,

Equation 2b gives us $\{T(\text{disk})\}^2 = 1/3$, equation 3b gives $\{T(\text{sphere})\}^2 = 1/2$,

by introducing these three values into equation c gives:

$$[1/6 + 1/3 + 1/2] = 1 \text{ (equation)}$$

$$[1/6 + 2/6 + 3/6] = 1 \text{ (equation)}$$

$$[(1 + 2 + 3)/6] = 6/6 = 1,$$

one has to check the consistency of the equations 1b, 2b, 3b, with the equations b, c, d,

and if the constant 2 in equation 2b, or a constant in equation 1b, this consistency is not

more (if not the same proportional constant),

for example I try only the equation with equation 2b 3b, replacing the 2 Constant in 2b of the equation by a constant greater and it does not work, this does not equal consistent after the addition, which leads to the following conclusion:

Conclusion:

The gravitational acceleration is proportional to mass per unit area, as is written the equation a, then my equations 1a, 2a, 3a, 1b, 2b, 3b, is accurate.