GALACTIC ROTATION ANOMALY

According to 'MATTER (Re-examined)'

Nainan K. Varghese, matterdoc@gmail.com
https://www.matterdoc.in/

Abstract: Orbital speeds of stars, far from the centre of a galaxy, are found to be roughly constant, instead of reductions predicted by current gravitational theories (applied on galactic and cosmological scales). This phenomenon is known as the anomalous rotation of galaxies. This article aims to demonstrate that the constant angular speeds of all macrobodies in a galaxy are a natural phenomenon, and there is no mystery about it.

Keywords: Galaxy, Stable galaxy, rotational anomaly.

A planetary system is a group of macrobodies, moving at a certain linear speed in a circular path around the galactic centre. The central body of the planetary system is by far the largest and controls the mean linear speeds of all other members. Gravitational attractions between the macrobodies of a planetary system cause perturbations in their directions of motion, resulting in additional curvatures of their paths. When perturbed paths of smaller macrobodies are related to the central body in an assumed static state, we get apparent orbital paths of planetary bodies. They appear to revolve around a static central body in elliptical/circular paths. Apparent orbital paths are unreal constructs about an imaginary static state of the central body. They are convenient to find the relative positions of macrobodies in the system and to predict cyclic phenomena that occur annually. In reality, planetary bodies do not orbit around a central body, but they move along with the central body in wavy paths about the central body's mean path. Central and planetary bodies move at a mean linear speed along their common curved path around the galactic centre.

Perturbations of orbital paths of macrobodies in a planetary system are related directly to their 3D matter-content (mass) and the inverse square of distance from the central body. Distance from the central body has a greater effect on the magnitudes of perturbations. Hence, normally, the paths of planetary bodies at greater distances from the central body are perturbed by lesser magnitudes. Curvatures and thus angular speeds of their apparent orbits reduce as the distance from the central body increases. Since the planetary system has no real spin motion, this is an imaginary phenomenon. However, many learned cosmologists seem to take the spin motion of the planetary system as a real phenomenon and consider that members of all spinning groups of macrobodies should behave in a similar manner, i.e., the angular (spin) speed of members should reduce as their distance from the centre of the system increases.

A stable galaxy consists of many macrobodies revolving around its centre. This group can be considered as a spinning fluid macrobody, rotating at a constant angular speed. Gravitational collapse initiates spin motion of the galactic cloud and maintains a constant spin speed of the outer parts of a stable galaxy. The centre part of the galaxy, which is usually hidden, may or may not be spinning. We can observe only visible stars and their angular speeds about the galactic centre. Linear motions of macrobodies, caused by gravitational attractions towards other macrobodies in the system, have two components each. One component, due to additional linear work invested in association with it, produces the macrobody's linear motion, in a direction slightly deflected away from the centre of the circular path. Another component towards the centre of its circular path is caused by additional angular work invested in association with it. This component produces the angular motion of the macrobody.

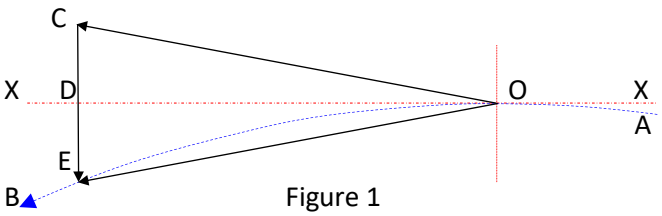

Figure 1

All 3D matter-particles in a fluid macrobody, spinning at constant speed, have constant angular speeds. Consider a matter-particle at O, in figure 1, moving in a circular path AOB. XX is tangent to the circular path at O. Instantaneous linear speed of the 3D matter-particle is represented by arrow OC, in magnitude and direction. It has two components: OD, along the tangent XX, and DC, perpendicular to the tangent XX and away from the centre of the circular path. This component, DC, represents the centrifugal action on the 3D matter-particle due to its motion in a circular path. In order to maintain constant curvature of the path, a 3D matter-particle has to have instantaneous linear (centripetal) motion equal to CE toward the centre of the circular path. If the magnitudes and directions of instantaneous motions are as shown in Figure 1, the 3D matter-particle maintains its motion along the circular path AOB at constant angular speed.

Should the 3D matter-particle increase its instantaneous linear speed for any reason, both components OD and DC would increase. The component OD tends to move the 3D matter-particle at a greater linear speed along the tangent XX. The outward component DC tends to move the 3D matter-particle away from the centre of its circular path. The 3D matter-particle tends to increase the radius of curvature of its path. This action is usually assigned to an imaginary 'centrifugal force'. In reality, the expansion of the radius of curvature of the path is caused by the centrifugal component of linear motion. A reduction in the centripetal action also produces similar results.

Should the 3D matter-particle decrease its instantaneous linear speed for any reason, both components OD and DC would reduce. The component OD tends to move the 3D matter-particle at a lesser linear speed along the tangent XX. A reduction in the outward component DC tends to move the 3D matter-particle towards the centre of its circular path. The 3D matter particle tends to reduce the radius of curvature of its path. A reduction of the radius of curvature of the path is caused by a reduction in the centrifugal component of linear motion. An increase in centripetal action also produces similar results.

In other words, a 3D matter-particle regulates its distance from the centre of its circular path so that its angular speed remains constant. This is the reason for the action of centrifuges. As linear speeds of 3D matter-particles increase, they move outwards, in an effort to maintain their angular speed constant.

Additional work, done for the linear motion of a 3D matter-particle and additional work done for its angular motion, are entirely separate and distinct. Additional work for the linear motion of a 3D matter-particle can produce only linear motion, and additional work for angular motion can produce only angular motion. In the case explained above, the increase in the linear speed of the 3D matter-particle is considered. That is, additional work invested in association with the 3D matter-particle is of a linear nature. It can only increase its linear motion. As no additional work (for the angular motion) is invested in it, the 3D matter-particle cannot change its angular speed. Instead, the 3D matter-particle is compelled to move away from the centre of its rotation, so that it can increase the magnitude of linear motion while keeping the magnitude of angular motion constant.

Similarly, an increase in the centripetal effort invests additional work, required for the angular motion of the 3D matter-particle. The 3D matter-particle tends to increase the magnitude of its angular motion. The curvature of its path increases as it reduces its distance from the centre of the circular path. The 3D matter-particle tends to move towards the centre of the circular path, so that it can increase its angular speed while keeping its linear speed constant.

Every macrobody in a stable galaxy behaves in a manner similar to the 3D matter-particle, represented in Figure 1. They tend to position themselves in the system so that their linear and angular speeds match the corresponding work associated with them. Macrobodies in the system strive to maintain their angular speeds constant by keeping an appropriate distance from the centre of

rotation. Macrobodies towards the central region may experience additional centripetal effort. They might increase their angular motion and move towards the central point to merge with the 'black hole' present there. In due course of time, macrobodies on the outer fringes move away from the galaxy and destroy its stability.

In a galaxy, various macrobodies arrive at their relative position, gradually (by error and trial), during which their relative positions and linear and angular speeds are stabilised. Galaxy, as a whole, stabilises only when constituent macrobodies have reached their steady relative positions and motions. In order to maintain stability, it is essential to maintain the relative positions of all constituent macrobodies by having constant and equal angular speeds and linear speeds corresponding to their distances from the galactic centre. A change in relative position or linear or angular speed of even one macrobody in the system is liable to destabilise the galaxy.

As and when superior 3D matter-particles at the fringe of galaxies attain linear speeds approaching the speed of light, they break down into primary 3D matter-particles and produce a halo around the equatorial region. Halos of neighbouring stable galaxies interact to prevent their translational movements due to gravitational attraction and maintain a steady state of the universe.

Therefore, constant angular speeds of constituent macrobodies of stable galaxies are their natural states. There are no mysteries or anomalies about them. This phenomenon is mystified by those who consider imaginary spin motions of planetary systems to be real. Therefore, assumptions of dark matter, time dilation, modification of gravitational laws, etc., and complicated mathematical exercises are irrational and unnecessary to prove a non-existing rotation anomaly of galaxies.

Conclusion:

Galactic rotation anomaly is a non-existent phenomenon, derived from the imaginary spin motions of planetary systems about their central bodies in assumed static states. Constant angular speeds of stars in a galaxy confirm the static state of the galactic center (in space), rather than producing an anomaly.

Reference:

[1] Nainan K. Varghese, *MATTER (Re-examined)*, https://www.matterdoc.in/

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