FLATTENING OF EARTH'S POLES

According to 'MATTER (Re-examined)'

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Abstract: Flattening of Earth's Polar Regions and bulging of its equatorial region are usually attributed to 'centrifugal force' due to Earth's spin motion. 'Centrifugal force' is fictitious, yet it is assumed to physically affect Earth's shape. Earth's spin motion is apparent only with respect to its own north-south central (spin) axis. With respect to absolute space, every point on earth continuously moves in the same (mean) direction as the direction of the sun's linear motion, at slightly different linear speeds. Very small centrifugal action (due to the differences in the linear speeds of its constituent 3D matter-particles) on Earth is not sufficient to produce the observed magnitude of equatorial bulge and flattening of its polar regions. This article describes an alternative mechanism that causes the observed physical deformation of the Earth.

Keywords: Flattening of polar regions, bulging of equatorial region, gravitational collapse, shape of Earth.

Due to the uneven structures of the landmass near its surface, the shape of the Earth (in minute details) is very complicated. However, for general purposes, the shape of the Earth is determined as an oblate spheroid (or oblate ellipsoid). This is the nearest approximation of Earth's shape, which bulges at the equator and is comparatively flatter at polar regions. As the southern hemisphere has a wider water surface than the northern hemisphere, it is flatter than the northern hemisphere. Bulge at equator, by which the earth's diameter in the equatorial plane is greater than its diameter in north-south direction, is currently attributed to an imaginary 'centrifugal force', due to the earth's apparent spin motion.

No macrobody can be static (without translational motion) in space. The Sun, the central body of the solar system, is a moving body. Its linear speed along a curved path around the galactic center is determined to be (about) 250000 m/sec. All macrobodies in the solar system move along with the sun. Therefore, real orbital paths of planets are wavy about the sun's mean path, with planets moving to the front and rear of the sun periodically. Average linear speeds of planets, in the direction of the sun's linear motion, are the same as the sun's linear speed.

Earth is assumed to rotate 360° in 24 hours, with respect to its spin axis. The highest tangential linear speed of any 3D matter-particle on Earth's surface (due to this apparent spin motion) is 463 m/sec. Superimposing displacements due to the apparent rotation and linear speed of the Earth, all 3D matter-particles on Earth move at linear speeds between 249537 m/sec and 250463 m/sec in the mean direction of the sun's linear motion. With respect to an absolute reference (or a reference outside the solar system), Earth has negligible rotary motion, and that may not qualify as spin motion. Therefore, although the Earth appears to spin about its north-south axis, it has negligible rotary motion in space. This precludes sufficient centrifugal actions on its 3D matter-particles to produce the observed deformation in Earth's shape.

Due to the gravitational attraction, all 3D matter-particles tend to move towards each other. In a macrobody, gravitational attractions between its 3D matter-particles gradually reduce the macrobody's size. This phenomenon is called gravitational collapse. All macrobodies are continuously under gravitational collapse. 3D matter-particles of a planet move towards (each other and) a common centre. The linear speeds of 3D matter-particles due to gravitational collapse are higher during the initial stages of planetary formation, and

reduce until the reaction (built-up pressure) within the planetary body is able to balance the actions of gravitational collapse.

The efficiency of external effort to act on a macrobody depends on its linear speed and the relative direction of the external effort. As the linear speed of the macrobody increases, the efficiency of (component in the direction of macrobody's linear motion of) external effort reduces. Theoretically, when the macrobody is moving at the speed of light, the efficiency of action of external effort on it, in the direction of its linear motion, becomes zero. That is, external effort or its components in the direction of the macrobody's linear motion cannot affect the macrobody when its linear speed becomes equal to the speed of light. In fact, long before a macrobody achieves the linear speed equal to the speed of light, it would decompose into constituent 3D matter-particles. At the speed of light, only photons (corpuscles of light) can survive. However, external efforts or their components in the opposite direction or in a perpendicular direction to the linear motion of the macrobody are fully effective on the macrobody.

In Figure 1, two circles, P and F, represent planes passing through the Earth and containing the direction of its linear motion and north-south axis. Large circle, P, in bold line represents the Earth during the initial stage of its formation, and smaller circle, F, in dashed line represents the Earth in the advanced stage of formation. A and D are the north and south poles. B and C are points on the equator; B is the foremost point, and C is the rearmost point, on Earth's surface. Central line XX_1 is the direction of Earth's linear motion.

Let us consider resultant linear displacements of 3D matter-particles at four representative points on Earth's surface during its formation/gravitational collapse. The magnitude and direction of linear motion of 3D matter-particles at points A, B, C, and D are represented by blue arrows, V. They are equal and unidirectional. Red arrows at these points represent displacements of 3D matter-particles due to gravitational collapse.

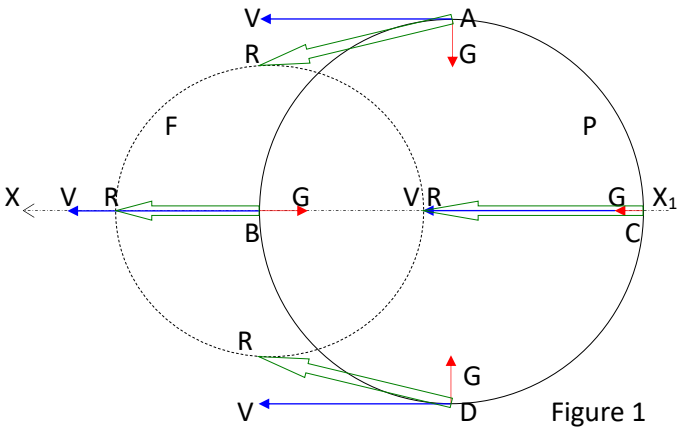

Figure 1

Gravitational attractions along AG and DG, being perpendicular, and the gravitational attraction along BG, being opposite to the direction of linear motion of the Earth, have 100% efficiency and thus are fully effective. Magnitudes of displacements by them are represented by arrows AG, DG, and BG. Resultant displacements of 3D matter-particles at A, B, and D are represented by the green block arrows, R. AR and DR are directed inward and are of equal magnitudes.

Since BV and BG are in opposite directions, their resultant BR is smaller in magnitude.

Gravitational attraction along CG, being in the same direction as the direction of Earth's linear motion, is less efficient. The magnitude of its action is inversely proportional to Earth's linear speed. Hence, the magnitude of displacement, CG, is shown as smaller. However, linear displacements due to the Earth's linear speed and gravitational attraction along the CG are unidirectional. Their resultant is shown by the green block arrow, CR.

3D matter-particles at all other points on Earth experience gravitational attraction at different angles to the direction of Earth's linear motion. Their components, which oppose or are perpendicular to the direction of Earth's linear motion, are fully effective. The efficiency of their components, which are in the same direction as the direction of Earth's linear motion, reduces in proportion to Earth's linear speed.

As a result, during the initial stages of gravitational collapse (formation of the Earth), its shape gradually became smaller and changed to a spheroid as shown by the smaller circle, F, in a dashed line. Polar regions, A and D, are flatter compared to the equatorial region, BC. Flattening of polar regions A and D has nothing to do with the negligible spin motion of the Earth.

Earth's southern hemisphere has a greater surface area under water. Hence, it is comparatively smoother. All actions by gravitational collapse and deformation of the Earth, caused by it, are, more or less, evenly distributed. Uniform distribution of gravitational collapse causes the curvature of the surface to be even. Thus, the surface of the southern hemisphere appears flatter compared to the surface of the northern

hemisphere, where gravitational collapse is unevenly distributed. Macrobodies with continuous fluid surface have even curvatures for both of their hemispheres.

Flattening of polar regions and bulging of equatorial action continue as long as the displacements of 3D matter-particles, due to gravitational collapse, continue. The degree of flattening of polar regions is proportional to the linear speed of the macrobody rather than to its spin speed. Similar effects are applicable to all linearly moving macrobodies that are under appreciable gravitational collapse.

Reference:

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

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