

Dzhanibekov Effect

According to 'MATTER (Re-examined)'

by

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Abstract: A free gyroscope, on or near another large macro body and asymmetrically loaded along its spinning axis (in the horizontal plane), will continue to precess about an axis passing (vertically) through its centre of mass and perpendicular to the spinning axis. The action of resultant gravitational attractions between basic 3D matter particles in both the gyroscope and the large macrobody is through a point on its spin axis away from the centre of mass. A similar effect appearing on a spinning body in a gravity-less environment and moving in a linear direction across its plane of rotation appears as the 'Dzhanibekov Effect'.

The entire space, outside the most basic 3D matter-particles, is filled by an all-encompassing universal medium. It is a combination of 2D latticework-structures by quanta of matter in all possible planes.

Due to its structure, the universal medium is inherently under compression. A 3D matter-particle, in the universal medium, experiences compression from the universal medium. This property of the universal medium is gravitation. The magnitude of gravitation corresponds to the extent of the universal medium that exerts the pressure. The extent of universal medium between two 3D matter-particles is always less than the extent of universal medium on their outer sides. Hence, higher gravitational pressure on the 3D matter-particles from the outer sides tends to move them towards each other. This tendency is understood as gravitational attraction or gravity. Gravitational attraction (gravity) is the resultant (relatively minor by-product) of separate gravitational actions on two 3D matter-particles by the universal medium.

Corpuscles of radiation (photons) are the most basic 3D matter-particles. They are created by gravitational actions of the universal medium from free quanta of matter available within gaps in its latticework structures. Universal medium gathers free quanta of matter, compresses and shapes them into disc-shaped 3D matter-cores of photons, which spin at a spin speed proportional to their 3D matter-content and move at the highest possible (hence constant) linear speed with respect to the surrounding universal medium. Movements of 3D matter-cores of photons are accomplished by the transfer of structural distortions, formed in the surrounding universal medium, which have many similarities with EM waves in each plane. 3D matter-core and the related structural distortions in the surrounding universal medium, together, form a photon. 3D matter-core provides its particle nature, and structural distortions in the surrounding universal medium provide its wave nature in each plane. Complementary high-frequency photons, in different combinations, form all other superior 3D matter-particles and macrobodies.

For analytical purposes, gravitational attraction on the whole of a macro body is assumed to act through its imaginary centre of gravity. However, gravitational attraction between two macrobodies is the average sum of independent gravitational attractions between each of the constituent photons on one body and each of the constituent photons in the other body, at any instant. Therefore, the magnitude of gravitational attraction at any point in a macrobody depends on the distribution of 3D matter-content within the macrobody.

Universal medium is a self-stabilising structure and is the originator of all actions in nature. It is its inherent nature to transfer structural distortions from a region of higher distortion-density to a

region of lower distortion-density. During such a transfer, 3D matter-particles within the region of moving structural distortions are also carried along with the moving structural distortions. Displacements of constituent photons of a macrobody result in the movement of the macrobody in space.

Instantaneous direction of motion of an object, moving in a circular path, is deflected outwards from the tangent to any point on the path. This creates an appearance that the object tends to move outward from the centre of its circular path. This tendency is currently attributed to an imaginary centrifugal force. To maintain the circular path of the object, action by a real centripetal effort (force) on the object is essential.

In the case of a rotating body, the required centripetal effort is provided by the integrity of the body. In the case of a body that is orbiting about a much larger central body, centripetal effort (required to maintain its curved path about the central body) is provided by gravitational attraction between these bodies.

Let us consider an orbiting body whose 3D matter-content is distributed symmetrically about its geometrical centre. The action of gravitational attraction towards the central body is through the centre of gravity of the body that coincides with its geometrical centre. If the body itself is rotating about an axis along its linear motion, outward deflection of its linear path is neutralized by displacement due to gravitational attraction between the central body and the orbiting body, and the orbiting body continues to maintain the curvature of its orbital path.

Consider another orbiting body, whose 3D matter-content is distributed unevenly along the direction of its linear motion. Magnitudes of gravitational attraction towards the central body at every point along its spin axis vary in proportion to the 3D matter-content about that point. If this body is rotating about an axis in the direction of its linear motion, the heavier end of the body has a higher magnitude of gravitational attraction towards the central body. Uneven efforts, acting perpendicular to the spin axis of a rotating body, invoke gyroscopic precession and result in the body turning about an axis perpendicular to its spin axis. Such a body would flip itself (in the same direction and in the same plane) as it moves along its curved path about the central body. This phenomenon gives rise to 'Dzhanibekov Effect', which is mathematically explained by the 'Tennis Racquet Theorem' in contemporary physics.

A free gyroscope, on or near another large macro body and asymmetrically loaded along its spinning axis (in the horizontal plane), will continue to precess about an axis passing (vertically) through its centre of mass and perpendicular to the spinning axis. The action of resultant gravitational attractions between basic 3D matter-particles in both the gyroscope and the large macro body is through a point on its spin axis away from the centre of 3D matter-content (mass). A similar effect appearing on a spinning body in a gravity-less environment and moving in a linear direction across its plane of rotation appears as 'Dzhanibekov Effect'.

Reference:

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

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