Origin of the rotation of a planet on its axis.

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Abstract. In this paper we consider some problems of the origin of body rotation under the influence of the thermal radiation.

Keywords. Center of mass, thermal radiation, differential equations of second order curves [1].

In this paper we present the shift of the center of mass under the thermal radiation. On Earth, the center of mass coincides with the center of gravity. Suppose two metal bars (P1 and P2) has equal lengths l1 and l2 and has equal masses m1 and m2. Let they be connected through a thermal-resistant separator and let the whole construction be hanged over the center of mass. Figure 1a. Let a source of the thermal radiation be placed under the second bar P2. Under the influence of the radiation the length of the second bar increases by the value d. Figure 1b. As a result the center of mass of the second bar moves from the point C2 to the point C3. The fact that (O, C3) is longer than (O,C1) leads to the moment of rotation M is take place. In the gravitational field of Earth we can calculate the direction of the rotational moment M.

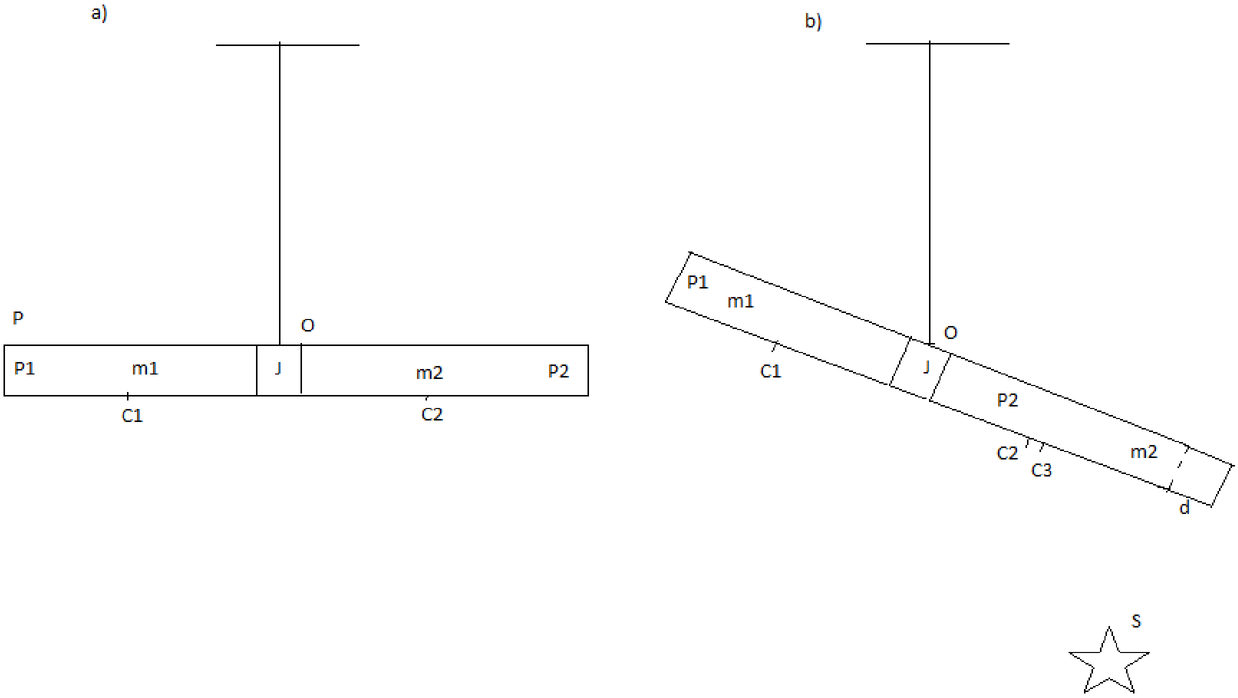

Figure 1

Let us place the bar P in the space and repeat the experiment. The fluctuation of molecules is more intensive in the heated part of the construction. Let's suppose that the rotation moment arises under the influence of the thermal radiation. Taken it into account let's consider following problems.

Problem 1.

We consider the first problem in vacuum and in zero gravity space.

In the XY coordinate system, let a body B be placed on the distance OH from the axis X. For the sake of simplicity suppose B is a solid homogeneous ball with the mass m. Let's drop a perpendicular on the axis X, let a source of the thermal radiation S be placed into the point where the perpendicular and the axis X intersect. Suppose the temperature of the environment T is less than the temperature of the source of radiation T1. Suppose no forces are acting on B. Figure 2

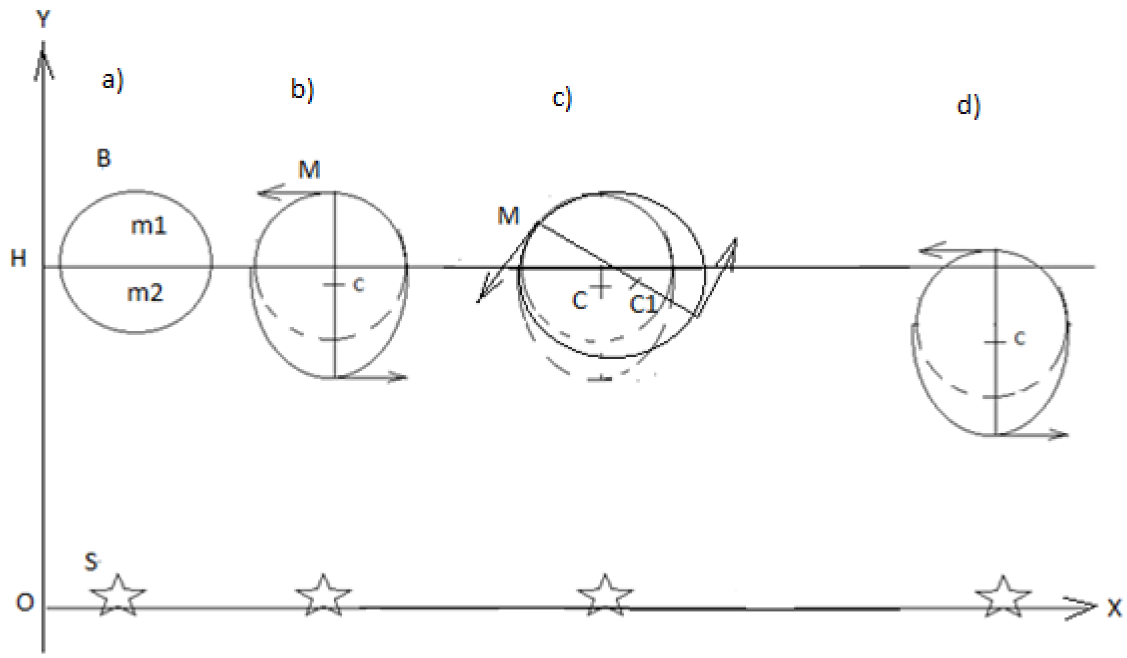

Figure 2

Let m1=m2, m1 + m2 = m. The part of B which is closer to S expands under the influence of the thermal radiation. As a result the center of mass shifts by Δy in the direction of S. Also as a result of heating a rotation moment M arises. It is not important in what direction the rotation starts. Suppose the rotation is in the direction of +X and α is the angel of the turn. The center of mass shifts by $\Delta y1$ and Δx. The opposite side of B starts to cool down. Let us move S by Δx and repeat all steps. As a result B and S collide in some time.

Problem 2.

The conditions are the same as in the first problem, but S does not move. B moves along a second order curve. Figure 3. To the orbit be stable it is required that the center of mass of B always be on the curve.

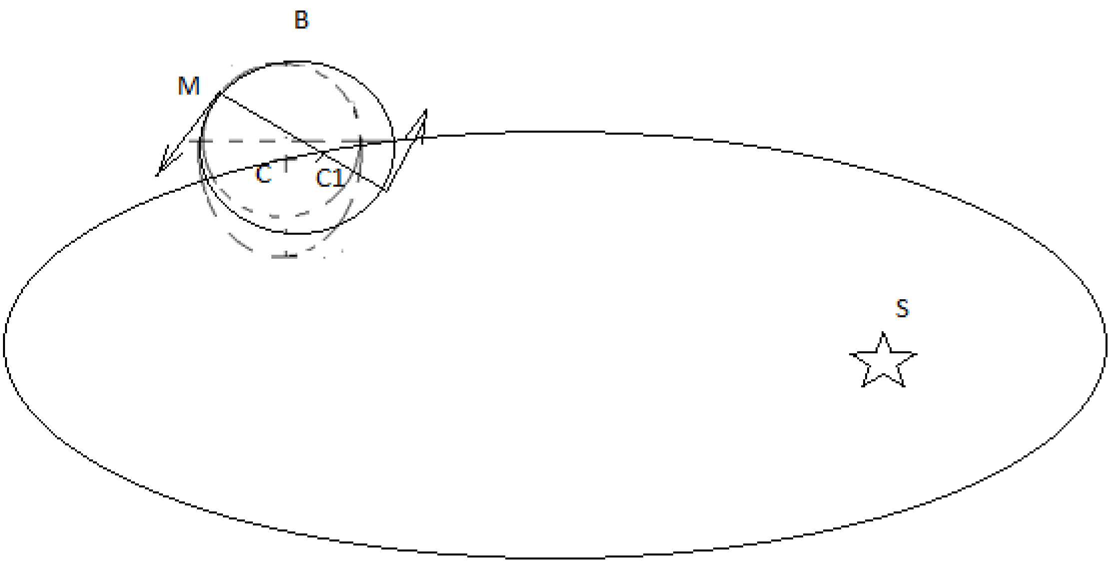

Figure 3

The main goal is to find formulas or create algorithm to find relationship between the mass of B, the coefficient of thermal expansion, the intensity of the radiation and the orbit of B. The differential equations of second order curves may be used for this [1].

The rotation on axis of planets and the absence of such rotation for satellites may be considered as an indirect confirmation of the existence of the solution. An example of the Moon.
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Reference

1. http://vixra.org/abs/1512.0253