

Abstract Submitted  
for the APR10 Meeting of  
The American Physical Society

**The Pioneer Effect as a Local Manifestation of the Global Non-Holonomy of Space** DMITRI RABOUNSKI — This study answers the Pioneer effect - the anomalous braking acceleration gained by the NASA deep space missions, and first observed on Pioneer 10 and 11. The problem is considered by means of the General Theory of Relativity, using the mathematical apparatus of physically observable quantities (Zelmanov A.L., Soviet Physics Doklady, 1956, vol.1, 227-230). A globally non-holonomic space is considered: there the time lines are non-orthogonal to the three-dimensional spatial section, which is manifested as three-dimensional rotation of the space. If the non-holonomy field is vortexless, it does not produce forces of inertia, or anisotropy of the space; only a uniformly distributed field of the linear velocity of the space rotation, manifested equally in any direction in which we measure it, is present. It is shown, through the geodesic equations, that any body travelling in the space gains an additional braking acceleration along the direction of its travel due to the space non-holonomy. This effect increases with the distance travelled by the body. This calculation meets the Pioneer effect that gives a complete theoretical explanation to it.

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Date submitted: 20 Oct 2009

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