Abstract Submitted
for the NEF08 Meeting of
The American Physical Society

On the Doppler-Like Anisotropy of the Space-Time of General Relativity. DMITRI RABOUNSKI, LARISSA BORISSOVA — We consider a light signal (photon) originating on the Earth, whose reference space is non-holonomic (where the time lines are non-orthogonal to the spatial section due to the Earth's rotation) and is moving toward a direction in the cosmos relative to a net fixed upon the resting stars. Two cases are under study: a photon radiated toward the motion, and orthogonal to it. To find the deviation of the photon from the initial direction, we consider the equations of isotropic geodesics (the equations of motion of a light-like particle). To simplify the calculation, we consider a satellite-bound observer (in a weightless state), where the force of gravity is put into equilibrium by the space rotation. The geodesic equations indicate the deviation of both radial and tangential photon from its initial direction due to the space rotation and the toward motion contained in the space metric. As a result the field of distribution of the photons attains a first-order anisotropy v/c along the motion of the space while the velocity of light remains constant (we call it the "Doppler-like anisotropy"). In a resting or holonomic (non-rotating) space the anisotropy effect vanishes.

Dmitri Rabounski

Date submitted: 17 Sep 2008 Electronic form version 1.4