

Despite that in SS posts in the thread, last one March 17, it is quite clearly rigorously scientifically it is explained that there cannot be fundamentally any energy in any fundamental Nature force field [including in Gravity Force case in standard GR energy in “spacetime curvature”] – **that evidently violates the energy conservation law**, in the thread again such claims as

“...The discussion of the energy density of gravitational fields is essentially touching the basics of physics...”

- appear.

What happens really at the Forces actions in coupled by a Force systems of interacting elements is rigorously scientifically clarified in the Shevchenko-Tokarevsky’s Planck scale informational physical model, now the recent iteration of the model’s paper see <https://www.researchgate.net/publication/395113364> **Planck scale informational physical model and fundamental problems in physics** section “Mediation of the fundamental forces in complex systems”.

Including about what happens in the fields is in the paper’s passage

.... An example: a system of two particles that are at rest in the 3D space, have rest masses  $M$  and  $m$ , so have “intrinsic own” energies  $Mc^2$  and  $mc^2$ , total system’s energy  $E_s = Mc^2 + mc^2$ . Particles interact by an attractive Force [say, by Gravity], are on  $\sim$ infinite distance; and after a small impact on  $m$  move toward each other.

Their current kinetic energies  $E_{ckM}$  and  $E_{ckm}$  increase, current rest masses,  $M_c$ , and  $m_c$ , decrease, however the sum of their energies  $E_s$  remains be the same.

If the Force is repulsive, particles don’t compose closed systems, so can move decreasing distance between only having correspondingly directed not-zero kinematical momentums, kinetic energies and speeds. In this case analogue to the above example is as: a particle that has rest mass  $m$ , inertial mass  $m_i$ , kinetic energy,  $E_k$ , moves on  $\sim$  infinite distance toward  $M$  at speed  $V$ , at that its energy  $mc^2 + E_{km} = m_i c^2$ ,  $m_i$  is the particle’s **inertial** [“relativistic”] mass. The system’s energy on  $\sim$  infinite distance  $E_s = Mc^2 + mc^2 + E_{km}$ .

At the motion the particle’s speed  $V$  and its current energy  $E_{kmc}$  are decelerating [ $M$  is accelerated, but if  $M \gg m$  that isn’t essential here], its **current inertial mass**  $m_{ic}$  decreases - however its **current rest mass**  $m_c$  increases.

When the particle stops in the 3D space, its current energy  $E_{kmc} = 0$ , but, if  $M \gg m$ , its rest mass is practically equal **to its inertial mass  $m_i$  on infinity**. When repulsed particle is returning back, its current rest mass  $m_c$  decreases,  $E_{kmc}$  increases, and on large distance from  $M$  its speed is practically [a bit lesser than] equal to  $V$ . At any time moment total system’s current energy  $E_{sc} = Mc^2 + m_c c^2 + E_{kMc} + E_{kmc} =$  [always]  $Mc^2 + mc^2 + E_k$ .

Just by this way **in closed systems the whole system’s energy is always constant, the Forces only govern the exchange by momentums between systems’ elements**, what results in pumping-repumping energy between the elements’ kinetic and intrinsic “rest mass” energies. From intrinsic energy into kinetic one, if the directions of Force mediators’ elementary momentums [ $p_e = \pm \hbar/r$ ] and the irradiated elements’ motion are the same; and oppositely, if the directions are opposite. At that really exchanging by mediators caused [“macro” momentums, at interactions  $p \gg p_e$ ]  $p$ , happens. Say, at small speeds  $E_s = p_M^2/2M + p_m^2/2m$ , i.e. the pumping-repumping energy happens “automatically” and is in certain sense secondary.

Cheers