Part 5. The new balance of energy in an inelastic collision of material masses at small speeds.

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To get the energy balance let's recollect well-known example of redistribution of kinetic energy between the two point objects at their amorphous (inelastic) collision. Under understanding of point objects, we mean infinitesimal small points that have masses. Let masses of the point objects are taken an arbitrary and speed of their collision is very small, and tends to zero in the system at rest. Let the mass of the first point objectis equal to $\mathbf{m_1}$, and its speed is equal to $\mathbf{U_1}$. The mass of the second point objectis equal to $\mathbf{m_2}$, and it is at rest. See figure 1.

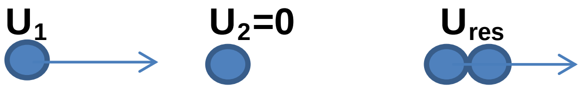

Figure 1.

Because the collision of the point masses occurs along a single axis, we replace the velocity vector by scalar. After, we using the total momentum before and after collision shall find the resultant velocity of the two masses after the collision.

$$\mathbf{m_1 \cdot U_1 = (m_1+m_2) \cdot U_{res}}, \text{ hence } \mathbf{U_{res} = \frac{m_1 \cdot U_1}{m_1+m_2}}$$

All these mathematical calculations are simple for the reader, but they are necessary to further criticism of established concepts in physics. They have to be considered in detail to show their inconsistencies. Let's consider the kinetic energy, which has the point with mass $\mathbf{m_1}$ before the collision, and the kinetic energy of the points with masses $(\mathbf{m_1+m_2})$ are sticking together. The kinetic energy of the point mass $\mathbf{m_1}$ is equal to:

$$\mathbf{E_1 = \frac{m_1 \cdot (U_1)^2}{2}}$$

After the collision, the kinetic energy of point masses are sticking together is equal to:

$$\mathbf{E_{(1+2)} = \frac{(m_1+m_2)\cdot(U_{res})^2}{2} = \frac{(m_1+m_2)(m_1\cdot U_1)^2}{2\cdot(m_1+m_2)^2} = \frac{(m_1\cdot U_1)^2}{2\cdot(m_1+m_2)}} .$$

Let’s analyze these kinetic energies. To do this, let 's find their difference.

$$\mathbf{E_{diff} = E_1 - E_{(1+2)} = \frac{m_1\cdot(m_1+m_2-m_1)(U_1)^2}{2\cdot(m_1+ m_2)} = \frac{m_1\cdot m_2\cdot (U_1)^2}{2\cdot(m_1+m_2)} \geq 0} \quad (1)$$

The result shows the positive difference energies. This says that in the inelastic collision the kinetic energy of the first material point is not completely turns into the energy of motion of two agglomerated material points. But the energy in a closed system can not disappear, but the balance of resulting shows the opposite result. Since the concept of kinetic energy was based on Newton's laws, then assume that Newton's laws are wrong - is absurd (at low speeds they are accurate). It remains one conclusion, which is suggested by classical physics. It is the transfer of energy from one form to another. In particular, part of the energy that is not turned into energy of agglomerated point masses is turned into "thermal" energy of the point masses. And, from the point of view of classical physics, this is enough. But the conclusion for the concept of energy was derived from the laws of classical mechanics, such as Newton's laws, the law of conservation of momentum, and so on. But there from point of view of of mathematics the mass is - a coefficient which has a physical dimension. Any ability to absorb or radiate heat, this coefficient in

Newton's laws has not. Moreover, all laws will be performed regardless what there is essence of mass, that is, the what volume is taken by this mass; what there is internal structure of mass and so on . The mass is “Black box”.

In particular, these laws apply to an infinitesimal volume, namely, to a mathematical point having mass. The structure here does not play any role, for an infinitesimal volume it is not defined. However, Newton's laws will work in this case too. If we go to the conservation of kinetic energy in the example of inelastic collisions, the concept of "mathematical point" with a mass does not has contradiction until we energy difference, which was obtained not equate to the heat. In this case, it will be "absurdity" (from the standpoint of classical physics). The difference between the energy that we got in the example has a value, and it is greater than zero. Therefore, if there we do not set limits on the value of mass, equating the difference between the energy to the heat energy **Q**, we can get an infinite density of thermal (heat) energy **T**.

$$\mathbf{T} = \lim_{\Delta x, \Delta y, \Delta z \to 0} \frac{\mathbf{Q}}{\Delta x \cdot \Delta y \cdot \Delta z} = \infty$$

Such a result is "unacceptable" from a position of physical reality. The density of thermal energy should blow up the point with mass, if there does not exist endless internal or external forces of restraint.

However, disbalance of energy can be eliminated in the wave model of elementary masses. Let’s consider this.

As it was shown in the fourth part of the presentation, in the space **ξ,y,z,x** there are reaction forces. Therefore, in this example, any mass has the energy of motion in our world, and in a parallel space simultaneously. Considering this factor we can find a new balance of energies in view of the energy that exists in a parallel space.

Before the collision, the first and second point mass had the following speeds of virtual movement in parallel space. The speed of the first point mass in parallel space, along the axis ξ is equal to $\mathbf{U}_{1\xi} = \sqrt{\mathbf{c}^2 - (\mathbf{U}_1)^2}$. The speed of the second point mass along the axis **ξ** was equal to **c**. The speed of the point masses, which stuck together after the collision is equal to:

$$\mathbf{U_{res\xi}} = \sqrt{\mathbf{c^2 - \frac{(m_1)^2 \cdot (U_1)^2}{(m_1 + m_2)^2}}} \quad .$$

Let's find the kinetic energy of the masses in a parallel space due to the virtual movements. Along the axis **ξ**, the first point mass has got energy that is equal to:

$$\mathbf{E_{1\xi}} = \mathbf{\frac{m_1 \cdot [c^2 - (U_1)^2]}{2}}$$

The second point mass has got energy, equal to:

$$\mathbf{E_{2\xi}} = \mathbf{\frac{m_2 \cdot c^2}{2}}$$

After the collision, the agglomerated masses have energy, equal to:

$$\mathbf{E_{(1+2)\xi}} = \mathbf{\frac{(m_1+m_2)\cdot(U_{res\xi})^2}{2}} = \mathbf{\frac{(m_1+m_2)\cdot(c^2 - \frac{(m_1)^2\cdot(U_1)^2}{(m_1+m_2)^2})}{2}} = \mathbf{\frac{(m_1+m_2)\cdot[(m_1+m_2)^2\cdot c^2 - (m_1)^2\cdot(U_1)^2]}{2\cdot(m_1+m_2)^2}} =$$

$$= \mathbf{\frac{(m_1+m_2)\cdot c^2}{2}} - \mathbf{\frac{(m_1)^2\cdot(U_1)^2}{2\cdot(m_1+m_2)}}.$$

Let's consider the difference between the kinetic energy in the parallel space before the collision and after it, and we consider its value and its sign.

$$\mathbf{E_{diff\xi} = E_{1\xi} + E_{2\xi} - E_{(1+2)\xi} = \frac{m_1\cdot[c^2-(U_1)^2]}{2} + \frac{m_2\cdot c^2}{2} - \frac{(m_1+m_2)\cdot c^2}{2} + \frac{(m_1)^2\cdot(U_1)^2}{2\cdot(m_1+m_2)} = \frac{(m_1)^2\cdot(U_1)^2}{2\cdot(m_1+m_2)} - \frac{m_1\cdot(U_1)^2}{2} =}$$

$$\mathbf{=\left[\frac{m_1}{(m_1+m_2)} - 1\right]\cdot \frac{m_1\cdot(U_1)^2}{2} = - \frac{m_1\cdot m_2\cdot (U_1)^2}{2\cdot(m_1+m_2)} \leq 0} \qquad (2).$$

Now let's analyze the results of the energy difference in the parallel space $\mathbf{E_{diff\xi}}$ and in our world $\mathbf{E_{diff}}$. See the results of (1) and (2). They show that in the parallel space after the collision the kinetic energy of agglomerated point masses become greater than the first mass and the second mass before the collision.

The value of increase in energy in the parallel space is exactly equal to the lost energy in our world. The balance of energy in an inelastic collision of point masses is preserved without transition in other form of energy.

$$\mathbf{E_{diff} = \frac{m_1\cdot m_2\cdot (U_1)^2}{2\cdot(m_1+m_2)} \geq 0}$$

$$\mathbf{E_{diff\xi} = - \frac{m_1\cdot m_2\cdot (U_1)^2}{2\cdot(m_1+m_2)} \leq 0} \qquad \text{or}$$

$$\mathbf{E_{diff} + E_{diff\xi} = 0.}$$

Here, this part of the material is finished.