15. Cosmic rays in the plane-particle model

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Our earth is permanently hit by a stream of extremely fast charged particles. It is assumed that per square meter and per second about 1000 protons, but also electrons and other ionized atoms collide with the earth's atmosphere. You imagine that these are individual particles that collide with molecules of the upper atmosphere at extremely high velocities, sometimes just below the speed of light, and trigger a flood of secondary particles. These secondary particles are registered on the ground and from the sum of these particles the properties of the primary particle are deduced.

A primary particle decomposes into up to 10^{11} secondary particles. A distinction is made between solar particles, galactic particles and extragalactic particles. The energies of the particles of the solar wind or those of solar flares are about 10 MeV, galactic particles have energies of 1 GeV and more, however extragalactic particles are even said to have energies of up to 10^{20} eV have reached. The highest particle ever measured, known as the "Oh My God particle", is said to have had an incredible energy of 3.2 10^{20} eV. The centre-of-mass energy is assumed to be 10^{15} eV, about one hundred times greater than the energies generated at Cern at the LHC. A single proton, which in its resting state only has energy of 938 MeV is said to have been accelerated so close to the speed of light that not only its kinetic energy increased extremely strongly, but also the mass of the proton many billions of times. This particle would have to have reached 99.99999999999999999999957% of the speed of light.

In our plane particle model, particle pairs can be generated from high-energy radiation, one particle and its antiparticle each, but protons cannot be converted into electrons, or a single very high-energy proton cannot produce two or more new secondary particles. Only via the electromagnetic radiation, particles can also be transmitted over long distances, make jumps.

Protons or electrons are accelerated by very strong electromagnetic fields. We separate charges in large numbers and thereby generate a voltage or a strong electric field. The many separated open charge carriers would like to neutralize themselves again, but they are integrated stably. A simple arrangement for accelerating charged particles would be two metal plates which are charged positively and negatively and into which, for example, a free electron is brought perpendicular to the plates. The charges on the plates are solid, but since there are many open charges, the particle always finds the next contact immediately after each contact, so that it is constantly accelerated. If the free electron is to be brought to very high velocities, the charge separation must be very large, i.e. the voltage extremely high. The higher the voltage, the further the plates have to be removed to avoid flashovers.

Charges are only accelerated by electric fields, not by magnetic fields. The field lines should be as longitudinal as possible to the movement of the particles. This would be the case in a plate capacitor. Positive ions are repelled by the negatively charged plate and attracted by the positive one. If an ion e.g. a proton passes through such a stress field, then it always absorbs the same amount of energy, no matter how far away the plates are and no matter what speed the proton had before entering the stress field. The amount of energy increase depends only on the voltage. If one now wants to bring a proton or electron to extreme high velocities, one can lead the beam with magnetic fields in a circle and accelerate it again and again through the same stress field. The charges on the plate capacitor must be conducted so, that only when the protons to be accelerated are inside the charge plates do the positive and negative charges build up and break down. The ions must feel a positive and negative field in front of and behind them, then the field lines lie in the direction of motion and the ions accelerate. However, it are not really the field lines that accelerate the protons and electrons, but the positive and negative charges themselves that must appear in front of and behind the ions. In the case of an electron, the negative charge of an electron behind the electron or the positive charge of a nuclear proton in front of the electron must make contact and, like in the case of free charges, be together for a short moment. The accelerating charges must therefore also have the velocity of the ion beam. This is achieved by suitable high-frequency fields.

In our model we have free charges, which see each other for a short time, but at the moment of contact the space in between do not exist, before the two charges jump back to their old position with a slight space shift in the next moment. At each contact, particles are always together at the moment of contact. If the kinetic energy of an electron or a positron is at the Compton wavelength, i.e. the energy that is equal to the mass both of them, than they loses their three-dimensional gravitational connections to other particles and they no longer jump back to the starting point. It looks as if two gamma quanta meet and an electron and a positron are generated. Actually, the two charges just don't jump back.

Quantum move in one dimension and at the speed of light. Particles jump in the same way at the speed of light, but are again three-dimensionally networked at the start and end points. They lose their position only for a tiny moment. During the contact to the other particle they are also not cross-linked. So we do not know that their position is somewhere else for a short time. Only if the energy is large enough these take all there network information with to the new position. The same happens at particle accelerator when the proton and the two charges, to accelerate the proton, get the energy value at which the Compton energy lies. Then the two charges attach themselves to the ion and remain there. So the proton does not gain speed, it only becomes heavier. Not one particle then flies further, but three particles with the corresponding additional mass. The ion has become heavier, has gained energy without becoming faster. For a while, only charges accumulate before the particle stream picks up speed again and accelerates. The next energy jump is that of the muon. Then again only the ions collect, without the beam becoming particularly faster. The same happens again at the pion jump and at the Proton jump, before then the whole new conglomeration of the many particles is only further accelerated.

The ion beam is focused by strong magnetic fields. On closed curves, charged particles lose energy through radiation, so there is a limit to the maximum energy, which depends on the radius, i.e. the size of the facility and the magnetic field density. It depends on how strong the magnetic fields can be compressed to hold the ion track together.

Thereafter a cosmic particle does not disintegrate into billions of secondary particles when it hits an air molecule, but consists of billions of particles which all separate again in a shower of rays.

But now we do not have it with a fantastically high, but completely unrealistic energy of a single particle, but to do with the fusion of billions of particles in the same centres of gravity system. The particle structure as a whole has a much more realistic velocity and thus also each of the individual particles. It is conceivable that over longer distance particles can be accelerated in a very strong cosmic magnetic field and that many secondary particles adhere to a proton. How a proton can be accelerated to 99.99999999999999999999957% of the speed of light cannot be imagined. With what a particle is to be accelerated that is so close to the speed of light, who or what then reaches the particle that has hardly any contact with the outside world? It is much more obvious to assume that all secondary particles were present even before the collision; they did not originate from the proton. There is the proton, the electron and unstable particles like the pion and the muon, but no electron can originate from a proton via the pion and muon decay and vice versa. A muon probably represents a resonance state of energetically highly charged electrons, but they are electrons, not protons. If at a fast proton, muons also occur during the collision, than because they were generated from electrons during the acceleration process and have attached themselves.

Muons are 207 times heavier than electrons, belong to the leptons of the 2nd generation, have the same spin, the same charge and otherwise behave like electrons, only that they are much heavier and of course short-lived. Their half-life is 660 µs. They occur either as Secondary particles of the cosmic background radiation on or can be generated in particle accelerators. The centre-of-mass energy is 106 MeV. This value is too high to be generated by natural radioactivity or nuclear reactions. So muons must arise at accelerations and since we claim that they are actually only heavy electrons and not naturally occurring heavy, independent particles, this fits into the picture. If electrons are accelerated in particle accelerators to velocities of near the speed of light, then their mass increases. In the plane image, the distance between the planes of the electron decreases. Either one argues with the Lorentz contraction or that in general the planes approach each other with increasing speeds. Furthermore, the distance in our model stands for the size of the mass. The speed cannot change arbitrarily fine, but the smallest change of speed is at $v_0 = 1.7 \cdot 10^{-12}$ m/s. The same applies to the displacement of the planes a smallest value, which is by $\delta = 10^{-57}$ m is located. Irrespective of the plane distance, electrons have a residence probability a_0, which for an atom in its lowest state is $a_0 = 0.5 \cdot 10^{-10}$ m, the Bohr radius. It should also have this uncertainty in free space. With increasing speed the mass and thus the impulse increase. According to Heisenberg, the blur decreases accordingly. A first step then represents the transition, with which the blur of the fast electron reaches the space step size R_e, the basic space size of our world. The plane distance of the electrons is then already much smaller than R_e. If the electron is to contract even further, the probability of residence is still below R_e, the only if the electron loses its three-dimensional electrical connections to other particles and becomes one-dimensional. The transition of R_e movements, which exceed the R_e distance and move towards the d_p planes, is indicated by an impulse, which has neither mass nor charge, and moves only in one dimension with c, a neutrino. In this case an electron neutrino. If we pump even more energy into the electron, then a neutrino is released when jumping smaller than R_e and changing to exclusively one-dimensional compounds. Then the electron can be accelerated again and take up mass.

Electrons rotate. In our picture, there is a gravitational connection to other particles, an electrical connection and the connection to the antiparticle at the edge. If the uncertainty of the electron now reaches exactly 2/3 of R_e, then the space rotation fits into this rotation cycle. The two electron planes with the mass and the plane distance of a muon are then inside R_e, 1/3 left of the R_e border and 2/3 right of the R_e border limitation. It divides the R_e space into three sections. After three cycles the electron or muon has its initial position within the blur again. The whole can therefore and remains stable in this one-dimensionality for the time being. These snap in is also indicated by an impulse which is emitted into space and which we interpret as muon neutrino or which we receive far away. Muons that accumulate on particle beams seem to remain trapped there for the time being. Free muons, can again be trapped by a muon neutrino and an electron neutrino in a convert an electron back, and get rid of their energy.

We can thus interpret particles as two planes that can shift, without newly introduced particles such as muons or neutrinos. We only have to work off the boundary conditions occurring in this model.