Particle acceleration in electric field

Particle acceleration is done typically in electric fields. No doubt exists in the fact that the energy a particle gets when it ran through a field with the total voltage U. Then the energy increase e.g. for an electron is e * U . This energy increase is independent of the particles entrance speed into the accelerating E field. In case that this independency shall be explained with special relativity this gets a little complicated, as the electric field becomes weaker the closer the entrance speed is compared to the speed of light c. On the other hand due to the time dilation in SR the electron experiences this reduced force for a longer time.

In the new theory there is no such complication, as the static or quasistatic electric field acts immediately on the charge, completely independent of the entrance speed into such a linear acceleation system. The electromagnetic waves created by an accelerated charge seems to be well known. But this New Theory might change that understanding, so that it becomes expainable, that rotating electrons in an atom do not radiate, though they are continuously accelerated towards the kernel.

In the following we consider only electrons as the effect is most prominent with these particles due to their high charge to mass ratio. It is valid also for all other charged particles.

When entering the acceleration path the electron will immediatly start to emit electromagnetic waves in the direction of acceleration. The electron will follow these self crated waves and is continuously accelerated. At first when the speed of the electron is lower than c, the created waves will increase their distance to the electron. If the path is long enough, the electron will reach the speed of light. Immediately afterwards with a speed higher than c the distance to the own created wave decreases, until the electron reaches its own created wave. A calculation shows, that the time it takes to reach its own first generated wave is always the same (for constant E-Field) completely independent form its initial speed entering the acceleration path. On the other hand the path length is dependent on the initial speed when entering the acceleration E-field. For cascaded accelerators follows that the first acceleration path can be the shortest, the higher the initial speed is the longer the path has to be, to avoid effects from interference with its own generated wave.

The distances for electron acceleration with Voltages in the range of 1 to 10 MV are in the range of some meters.

The higher the voltage the shorter is the distance until the electron reaches its first own created wave and with that the intensity of the wave acting on the electron increases.

What happens when an electron reaches its own created electromagnetic wave ?
This is not yet calculated anywhere (as far as the authors know) but one thing is clear, the electron cannot gain any additional energy (conservation of energy). The only remainig effect can then be that it loses energy by additional radiation.The radiation must become stronger the faster it gets to this point. (The energy-density of a created wave decreases with $1/r^2$.)

It can be expected that this radiation can become stronger than the radiation by its acceleration through the electric field, if the distance to the reach point is smaller than a certain limit.