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Teaching particle physics to high school teachers

Particle physics is one of the most remarkable endeavours undertaken by mankind. However, the achievements are largely beyond reach for all but the particle physicists themselves. Popular science and high school text books being riddled with oversimplified and to some extent incorrect information, learning these topics becomes virtually impossible for anyone outside of the field.

In this talk I will discuss how particle physics can be taught correctly to early bachelor students, of whom some are expected to become high school teachers.

The key is to carefully introduce concepts like particles (care must be taken here since particles are very different from classical particles, a far too often ignored point), Feynman diagrams and virtual particles; explaining their meaning without introducing the complicated mathematics of quantum field theory.

To further understand the construction of the standard model, one must introduce gauge theory and spontaneous symmetry breaking. It will be a mayor topic of this presentation to present a way of doing this in an intuitive and correct manner.

It is also demonstrated how the presence of infinities as well as renormalisation and RGE flow can be understood from a study of the electric field of an electron, requiring no more mathematics than an integral of Coulombs law.

Experimental Collaboration

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