

Particle Hunters. Special Relativity as a tool for discovery in Particle Physics

Lorenzo Galante

lorenzo.galante@polito.it

Special Relativity is a fundamental tool for the analysis of collision events in Particle Physics. This gives the opportunity to create educational environments in which interactions between theory and experimental data occur. An opportunity whose potentiality is worth exploring. An interactive application to analyse a collision between particles is presented as a tool that opens a mystery students have to solve using Special Relativity as an inquiry tool. As in a Role Play Game students are introduced into an environment they have the empathise with. They are asked to play the role of a particle physicist, to analyse a collision between a pion and an Helium nucleus and to solve the mystery that arises from their analysis: momentum seems not to be conserved. Will they have to dismiss the conservation law or start the hunt for an undetected particle responsible for the missing momentum? As in many Role Play Games, the participants have special powers or attitudes. Here the special power comes from Einstein's energy-momentum-mass relation, which will be the magic wand leading students toward the solution of the puzzle. "Particle Hunters" is an educational environment designed to promote a deeper understanding of specific aspects of Special Relativity and to foster empathy and critical thinking along the learning process.