

Re: IS high energy physics real ?

Source: <http://sci.tech-archive.net/Archive/sci.physics/2004-10/0862.html>

From: Gregory L. Hansen (glhansen_at_steel.ucs.indiana.edu)

Date: 10/03/04

Date: Sun, 3 Oct 2004 12:47:05 +0000 (UTC)

In article <415f1eaa\$1_1@127.0.0.1>, eighth man <eighth@libero-dot-it.no-spam.invalid> wrote:

>I have a few questions:

>

- >1) I read that particle physics uses
- >accelarators and computers to compare
- >results according to Feynman diagrams.
- >According to the precision these diagrams
- >may be 70 or 40000 and eventually millions
- >to trillions all very complex to calcuate.
- >At what point (decimal point;) will scientists
- >think the precision will be enough ? (a trillion
- >feynman diagrams?) And if so will they be
- >even able to calcuate it ? and even after won't
- >they be curious to know if a higher precision
- >could lead to something else ?

It depends on which question you're trying to answer. You always go for as much precision as reasonable, but in general, your theoretical precision only needs to be comparable to your measurement precision, and vice versa. I don't know high energy, but an example from low energy is that the standard model says the CKM matrix is unitary, while nuclear decay results say it isn't. But nuclear decays require a lot of theoretical corrections. Free neutron decays are theoretically cleaner, but currently is consistent with both possibilities. If the free neutron lifetime can be determined to less than about two seconds, it will agree with one or the other. Another example is neutron spin rotation, a parity violating effect, which is strong in e.g. a tin isotope. But tin is such a big system that nobody knows how to interpret the data. So they're trying (again) to measure neutron spin rotation in liquid helium, which is almost undetectable, but which is a small enough system that the theoreticians can interpret the data.

>

- >2) after the grand theory of everything is
- >achieved maybe 300 years from now, will
- >scientists still study all the theoretical structures
- >anyways even if it has no use for physics anymore ?

Re: IS high energy physics real ?

sci.physics: Re: IS high energy physics real ?

They will if they're interested in applying it.

>

>3) *particle accelerators, theories, computers*

>*etc. seem quite distant from reality... it makes*

>*me think sometime "is it real ?"*

>*I mean there is only one level separating a*

>*virtual reality program from reality (the program)*

>*whereas in particle physics we have about 5 or 6*

>*(accelerators, theories, computers, calculations etc)*

If you clonk your head on a bending magnetic, it will hurt! Those things are real, all right. You prepare an arrangement of equipment, and then it does stuff. It's not clear that finding the Higgs or whatever has any practical applications, but that's another matter.

--

"I'm giving you the chance to look fate in those pretty eyes of hers and say, 'Step off, bitch. This is my party and you're not invited.'"

-- Chris Shugart, *_Testosterone Magazine_*