

Cross section for $\mu^-,\mu^+ \rightarrow Higgs \rightarrow e^-,e^+$

Andrew Chegvidden, Brad Schoenrock

1 abstract

The purpose of this project was to familiarize ourselves with the calculation of cross sections based on feynman diagrams, as well as to familiarize ourselves with the LaTeX package. The process we will examine is higgs production at a muon collider decaying into an electron positron pair. We will begin with ... the beginning.

2 the beginning

we start with an expresion for ... stuff... blah blah blah

3 the diagram

insert feynman diagram here

we start by assigning momenta to each particle.

1. we take the momentum of the incoming muon to be ...
2. we take the momentum of the incoming antimuon to be ...
3. we take the momentum of the intermediate higgs to be ...
4. we take the momentum of the outgoing electron to be ...
5. we take the momentum of the outgoing antielectron to be ...

from the above feynman diagram we can write the matrix element piece by piece. from the $\mu^-,\mu^+,Higgs$ vertex we have...

the higgs propagator adds a factor of ...

and from the $e^-, e^+, higgs$ vertex we have...

giving us a matrix element of

4 I am the very model of a modern Major-General

.....

I am the very model of a modern Major-General,
I've information vegetable, animal, and mineral,
I know the kings of England, and I quote the fights historical
From Marathon to Waterloo, in order categorical;
I'm very well acquainted, too, with matters mathematical,
I understand equations, both the simple and quadratical,
About binomial theorem I'm teeming with a lot o' news,
With many cheerful facts about the square of the hypotenuse.

I'm very good at integral and differential calculus;
I know the scientific names of beings animalculous:
In short, in matters vegetable, animal, and mineral,
I am the very model of a modern Major-General.

I know our mythic history, King Arthur's and Sir Caradoc's;
I answer hard acrostics, I've a pretty taste for paradox,
I quote in elegiacs all the crimes of Heliogabalus,
In conics I can floor peculiarities parabolous;
I can tell undoubted Raphaels from Gerard Dows and Zoffanies,
I know the croaking chorus from The Frogs of Aristophanes!
Then I can hum a fugue of which I've heard the music's din afore,
And whistle all the airs from that infernal nonsense Pinafore.
Then I can write a washing bill in Babylonian cuneiform,
And tell you ev'ry detail of Caractacus's uniform:
In short, in matters vegetable, animal, and mineral,
I am the very model of a modern Major-General.

In fact, when I know what is meant by "mamelon" and "ravelin",
When I can tell at sight a Mauser rifle from a Javelin,
When such affairs as sorties and surprises I'm more wary at,
And when I know precisely what is meant by "commissariat",
When I have learnt what progress has been made in modern gunnery,
When I know more of tactics than a novice in a nunnery
In short, when I've a smattering of elemental strategy
You'll say a better Major-General has never sat a gee.

For my military knowledge, though I'm plucky and adventury,
Has only been brought down to the beginning of the century;
But still, in matters vegetable, animal, and mineral,
I am the very model of a modern Major-General.