Contribution ID: **707** Type: **not specified**

Muon Colliders for 10 TeV Center of Mass: The Accelerator and Collider

Wednesday 15 May 2024 14:50 (20 minutes)

The advantage of muons over electrons for a lepton collider is that one can accelerate and collide them in circular machines. Unfortunately muons are difficult to produce and have a short lifetime, and these basic issues drive most design choices for a muon collider. In particular, unlike most colliders, all the muons of a given sign in each pulse are combined into a single intense bunch. To keep decays reasonable, muons must be accelerated to their final energies in a small number of milliseconds. Accomplishing this with machines that are reasonably sized and cost effective requires unique solutions that maintain a high average bend field while allowing rapid energy variation. I will present two methods to accomplish this, hybrid pulsed synchrotrons and fixed field alternating gradient accelerators, describe recent work on their design, and outline challenges, including issues related to a machine that would fit on the Fermilab site. Once the beams are accelerated, the beams are collided in a ring. Since all the remaining muons eventually decay in this ring, management of the radiation load and the offsite neutrino beam intensity are essential to the collider ring design. Higher magnetic fields have a direct relationship to the luminosity in the collider ring, and thus magnet capabilities have a particularly direct impact on machine performance here. I describe important issues for the collider design and recent work on the collider lattice.

Mini Symposia (Invited Talks Only)

Plenary (Invited talks only)

Presenter: BERG, J. Scott (Brookhaven National Laboratory)

Session Classification: Minisymposium