Morges Seminar 1971 - Intersecting Storage Rings at Novosibirsk A.N. Skrinsky

$\mu^+\mu^-$ Possibilities

These experiments at hundreds GeV energy region will be available, only when several very difficult things will be discovered:

1. To have a very large number of protons with 10 GeV energy in rather short bunches. It is necessary to have about 10^{14} or even 10^{15} protons in about 10 sec in several meters long bunch.
2. To produce with maximum efficiency muons with 1 GeV or less energy, using nuclear cascade, strong focusing in the target and in pion decay channel. It seems possible to have 0.1 or even more useful muon per proton.
3. To cool muons in special 100 kilogauss pulsed storage ring, using ionization energy losses. If the targets are in places with very small β-function, the finishing emittance of muon beam should be small enough to be injected into the main muon accelerator with small aperture and to be well compressed in interaction points.
4. To accelerate muons rapidly in some accelerators. If the muons are accelerated to their rest energy in a time, several times less than their life time at rest, most of the muons will be accelerated up to the required energy. It is possible to use a linear accelerator, or to use a synchrotron with more than a 100 kilogauss and magnetic field with a short rise time. In the last case, the accelerator will be at the same time the colliding beams ring. In the ring with such a magnetic field it is possible to have several thousands of useful turns of muon beams.

If all of these conditions are satisfied, it seems to be possible to have an average luminosity $10^{31}\text{cm}^{-2}\text{sec}^{-1}$ and may be a bit more, which should be sufficient.

Accelerator and Detector Prospects of Elementary Particle Physics - A.N. Skrinsky

Institute of Nuclear Physics of the Siberian Division of the Academy of Sciences of the USSR, Novosibirsk, Usp. Fiz. Nauk 138, I-43 (September 1982)

This review treats the progressive changes in the filed of physics and technology of accelerators, and in part, of detectors, which have exerted and will in the near future exert a fundamental influence on the development of elementary-particle physics. In particular, it discusses the possibilities of generation of beams of elementary particles and the prospects of performing experiments with colliding beams involving the development of methods of cooling charged-particle beams, designing superconducting systems, and developing Superlinacs.

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