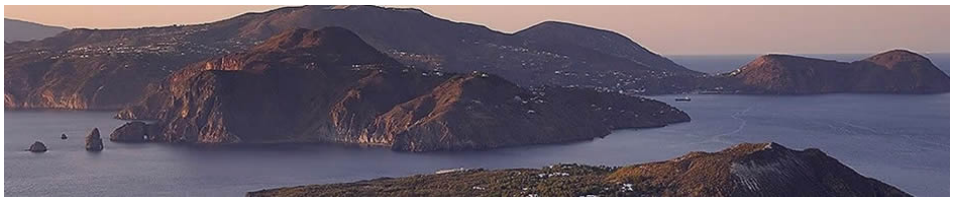

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The muon collider, status and prospects

Muon-based accelerators have the potential to enable facilities at both the Intensity and the Energy Frontiers in Particle Physics. A Muon Collider has the ability to study the direct (s-channel) production of scalar resonances like the Higgs boson while extending operations to a multi-TeV energy region enables a new field of measurements and discoveries. The traditional approach for these machines is based on the production of muons by means of an intense proton source. One of the most critical issues of this design is the cooling of the muons emerging from the hadronic interactions in the target. An alternative approach is based on muon pair production by a positron beam impinging on electrons at rest in a target. The main advantage of the new scheme is that the muons produced in the process at threshold are constrained into a very small longitudinal and transverse phase space region. This approach still needs to be verified with extensive studies and tests. Muon decays in the ring impact both the magnet and shielding design of the collider itself as well as backgrounds in the detector. Progress in muon accelerator designs has advanced steadily in recent years and therefore a muon collider appears more feasible in our future.

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