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SuperB: Design and Update[1]

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Low-energy e^+e^- colliders as heavy flavor factories are an important facet of the overall high-energy physics accelerator field. These high-luminosity colliders produce unprecedented data sets that allow for the study of extremely rare decays of heavy flavor mesons allowing them to push the Standard Model to new limits. Through the high-luminosity avenue these machines look for contributions to suppressed decay channels from new particles with very heavy masses. In addition, they can look for extremely weak couplings to lighter unknown particles. The high-energy physics theoretical community has, in recent years, developed the idea that there may be an entire sector of dark matter particles with masses as low as 1 GeV that couple only very weakly to ordinary matter. These suggested new particles can be looked for in these low-energy, high-luminosity machines. SuperB is a proposed high-luminosity B-meson factory to be built in Italy near the INFN laboratory in Frascati. The design calls for a luminosity of 1×10^{36} $cm^{-2}s^{-1}$, nearly 100 times higher than present day B-factories. Through a novel collision scheme, this collider achieves this high luminosity using beam currents and bunch lengths very similar to present day B-factories. The design calls for a large beam crossing angle at the collision point, very low-emittance beams (ala light source storage rings), a very small vertical beta function at the collision point and an implementation of a magnetically crabbed waist in order to achieve the desired luminosity. I will give an overview of the proposed design and an update on present progress.

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