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Multi-track Displaced Vertices at B-Factories

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We propose a program at B-factories of inclusive, multi-track displaced vertex searches, which are expected to be low background and give excellent sensitivity to non-minimal hidden sectors. Multi-particle hidden sectors often include long-lived particles (LLPs) which result from approximate symmetries, and we classify the possible decays of GeV-scale LLPs in an effective field theory framework. Considering several LLP production modes, including dark photons and dark Higgs bosons, we study the sensitivity of LLP searches with different number of displaced vertices per event and track requirements per displaced vertex, showing that inclusive searches can have sensitivity to a large range of hidden sector models that are otherwise unconstrained by current or planned searches.

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