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Searches for long-lived particles at LHCb with BuSca

BuSca (Buffer Scanner) is a real-time data monitoring and analysis framework designed to guide searches for new physics at the LHCb experiment at CERN, operating prior to any trigger decision. By accessing the full proton–proton collision rate of 30 MHz, it enables the exploration of previously inaccessible regions of phase space. Long-lived particle tracks are reconstructed and analysed in real time using highly GPU-optimized software in a model-independent approach. Preliminary results from Run 3 data, corresponding to more than 15/fb are presented, together with ongoing developments of this framework and prospects for Run 4.

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