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In situ monitoring of the stopped muon flux at Mu2e[1] BASTIANO VITALI[2], Univ of Rome La Sapienza — Mu2e searches for the neutrino-less coherent $\mu^- \rightarrow e^-$ conversion in aluminum nucleus field. The number of stopped muons (cardinal for the normalization) is proportional to the number of protons on target, which depends on the extraction system for the proton beam. Mu2e will use a resonant extraction characterized by intensity fluctuations on the time scale of milliseconds with non-trivial impacts on the performance of the apparatus. The apparatus includes two detectors developed to measure the normalization but encounter limitations when trying to monitor the flux at the millisecond timescales: the goal of my Thesis was to try filling this gap. The method is based on counting the number of muons captured in the stopping target by counting the number of protons produced by the nuclear muon capture. Cardinal task of this study has been to tailor the reconstruction routines to protons. An event is everything which happens in a 1.7 μs window between two consecutive proton pulses (time needed for the π to decay and μ): the reconstruction will be performed in a crowded environment. Our results are satisfactory since the number of reconstructed protons is significant (few per event), and show that a monitor on the timescale of milliseconds is indeed possible.

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[2]The MA thesis was written while I was a student at the University of Pisa.

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