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Time Stability in Detectors for a 1 ppm Measurement of the Positive Muon Lifetime BRETT WOLFE, MULAN COLLABORATION — The Mu-Lan experiment aims to obtain a 1 ppm measurement of the positive muon lifetime. In a 22 μ s measurement period for the muon lifetime there are considerably more muon decays at the start of the time and less near the end. We will determine if this bombardment of positrons will create a time delay within the detectors. A laser pulse is sent to 24 of the 340 detectors used to make the positive muon lifetime fit. The same pulse is also sent to a reference detector that does not go into the lifetime fit. The laser pulses are used to measure the time difference between the reference detector and the 24 detectors used to make the lifetime fit. If the muon bombardment does make a considerable difference, then graphing the mean time difference for a specific detector vs the time in the measurement period will show a slope. For a 1 ppm measurement, we need to make sure the time difference at the beginning of the period is within 2.2×10^{-13} s from the end of the period.

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