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**Sensitivity study for a branching fraction measurement of $\Xi_c^+$ decays to $\Sigma^+\pi^+\pi^-$ at Belle II.** ANIL PANTA, JAKE BENNETT, University of Mississippi — The decay $\Xi_c^+ \to \Sigma^+\pi^+\pi^-$ is singly Cabibbo-suppressed, with a reported branching fraction of $0.48 \pm 0.20$ by the SELEX experiment with events of 21 $\pm$ 8 events. With the high statistics data samples that will be available at Belle II, this mode, along with other similar modes, will be useful for comprehensive searches for CP violation in charmed baryon decays. We report a sensitivity study for this mode, including the use of machine learning techniques like fast Boosted Decision Trees (BDT) for signal isolation.

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