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### P4.093 Sensitivity of liquid xenon dark matter detectors to supernova neutrinos

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Liquid xenon dark matter detectors are now at the tonne scale and are sensitive to coherent elastic neutrino-nucleus scattering (CENNS) of supernova neutrinos. In this study, we forecast the expected event rate in current- and future-generation xenon experiments from the next galactic burst. In particular, we model the expected light (S1) and charge signals (S2) under realistic detector conditions. We find that dark matter experiments like XENON1T or LZ should expect  $\sim 20$  events per tonne due to the coherence effect. The short duration of the neutrino burst renders all potential sources of background negligible. Consequently, a brand new interaction channel in a new class of detectors has been opened to learn about supernovae through neutrinos.