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**Dinucleon and Nucleon Decay into Two-Body Final States with No Hadrons**[1] SARA SUSSMAN, Boston Univ, SUPER-KAMIOKANDE COLLABORATION — The violation of baryon number ($B$) is a consequence of many grand unified theories and is also one of the Sakharov conditions for baryogenesis. The Super-Kamiokande detector is a 50-kiloton tank of ultra-pure water (containing $1.2\times10^{34}$ nucleons) that is used to detect neutrinos and search for baryon number violating processes. In addition to searching for $\Delta B = 1$ decays such as proton decay, Super-Kamiokande data can be used to search for decays where $\Delta B = 2$. One type of $\Delta B = 2$ decay is dinucleon decay, where two nucleons in an oxygen atom decay together. We search for 10 dinucleon and proton decay modes which are characterized by a two-body final state with no hadrons. For example, our search included the dinucleon decay mode $pp \to e^+e^+$, and the proton decay mode $p \to e^+\gamma$. We use Super-Kamiokande data from April 1996 to April 2016, with a total exposure of 0.35 megaton-years. Here we present the search results and discuss their consequences.

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