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Titolo	First Measurement of the Muon Anti-Neutrino Charged Current Quasielastic Double-Differential Cross Section // by Joseph Grange
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Soggetti	Elementary particles (Physics) Quantum field theory Particle acceleration Elementary Particles, Quantum Field Theory Particle Acceleration and Detection, Beam Physics
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Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	Introduction -- Neutrino Overview -- Neutrino Oscillations -- Neutrino Interactions in MiniBooNE -- The MiniBooNE Experiment -- Introduction to the Cross-Section Measurement -- Background Measurements and Constraints -- $\mu$ CCQE Cross-Section Measurement -- Combined $\nu$ and $\mu$ CCQE Measurements -- Conclusion.
Sommario/riassunto	This book presents a major step forward in experimentally understanding the behavior of muon neutrinos and antineutrinos. Apart from providing the world's first measurement of these interactions in a mostly unexplored energy region, the data presented advances the neutrino community's preparedness to search for an asymmetry between matter and anti-matter that may very well provide the physical mechanism for the existence of our universe. The details of these measurements are preceded by brief summaries of the history of the neutrino, the phenomenon of neutrino oscillations, and a description of their interactions. Also provided are details of the experimental setup for the measurements and the muon antineutrino cross-section measurement which motivates the need for dedicated in situ

background constraints. The world's first measurement of the neutrino component of an antineutrino beam using a non-magnetized detector, as well as other crucial background constraints, are also presented. By exploiting correlated systematic uncertainties, combined measurements of the muon neutrino and antineutrino cross sections described in the book maximize the precision of the extracted information from both results.

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