

Title: Neutrino physics at NOvA experiment

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Abstract: This thesis describes neutrino phenomenology, with special aim at the phenomenon of sterile neutrinos and its experimental study, particularly in the NOvA experiment. Its aim is to clearly and comprehensibly introduce sterile neutrinos in context of historical and present measurements and discoveries. A brief summary of neutrino history is shown, as well as the theory of neutrino oscillations, including a description of matter effects and the effect of adding sterile neutrinos on the oscillation probabilities. NOvA experiment is presented, describing the neutrino source, the detectors and the used particle identification methods. Different experiments for the study of sterile neutrinos are listed and shortly described, with special concentration on the NOvA experiment and its measurement via the neutral-current channel. A detailed description of the first NOvA sterile neutrino result is provided, as well as the aspects of NOvA's current sterile neutrino analyses.

Keywords: neutrino, neutrino oscillations, sterile neutrinos, NOvA experiment