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Thesis title

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I hereby declare that I carried out this thesis independently, and only with the cited sources, literature and other professional sources.

I also declare that this thesis has not been and will not be, submitted in whole or in part to another University for the award of any other degree.

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Dedication

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List of Abbreviations

PMNS	Pontecorvo-Maki-Nakagawa-Sakata (matrix)
SNU	Solar Neutrino Unit
CC	Charged Current (interaction)
NC	Neutral Current
MSW	Mikheyev-Smirnov-Wolfenstein (effect)
SK	Super-Kamiokande (experiment)
NO	Normal Ordering (of masses)
IO	Inverted Ordering (of masses)
SBL	Short Baseline
LBL	Long Baseline
LSND	Liquid Scintillator Neutrino Detector
MiniBooNE	Mini Booster Neutrino Experiment
SBN	Short Baseline Neutrino (program)
NOvA	NuMI Off-axis ν_e Appearance (experiment)
NuMI	Neutrinos from the Main Injector
ND	Near Detector
FD	Far Detector
FHC	Forward Horn Current (neutrino mode)
RHC	Reverse Horn Current (antineutrino mode)
HC	Horn Current
LE	Low Energy (mode of NuMI)
ME	Medium Energy (mode of NuMI)
APD	Avalanche Photodiode
CVN	Convolutional Neural Network
MC	Monte Carlo
PPFX	Package to Predict the Flux
CMS	Center of Mass (frame)
BENDecomp	Beam Electron Neutrino Decomposition

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