Observed disappearance of reactor antineutrinos in the short baseline in Daya Bay can be explained by the phenomenon of neutrino flavour oscillations. The analysis in standard three-neutrino framework provides the best measurement of mixing angle of θ_{13} and the value of effective mass squared difference Δm^2_{ee} with comparable precision with other experiments. The unprecedented precision of Daya Bay motivates us to extend our search beyond standard three-neutrino oscillation scheme. It this thesis, we have explored two scenarios of possible physics Beyond Standard Model (BSM).

We have tested the fundamental symmetry of the nature by searching for the Lorentz Invariance violation effect within the framework of the Standard-Model Extension (SME). Such an effect could be observed as a deviation from three- neutrino oscillation prediction in the oscillated antineutrino spectrum. Since we have not observed any significant deviation, we have been able to set the limits on the SME parameters. Some of the limits were measured for the first time while some turned out not to be competitive with the measurement of other experiments.

We have also performed search for Non-standard Interactions (NSIs) in the Daya Bay. Being forbidden in the Standard Model, these interactions are predicted by BSM theories for which Standard Model is considered to be a low energy limit. Such NSIs effects could take place in the process of production and detection of the reactor antineutrinos and effectively modify the oscillation probability. In order to perform this analysis we have developed our own phenomenological approach to include the NSIs effect in the neutrino oscillations. No significant deviation from standard three-neutrino framework oscillation was found. We obtained limits on the NSIs parameter.