

This thesis is devoted to studies of the proper decay-time resolution function and particle decay vertex reconstruction tools, their applicability and role in the studies of time-dependent CP violation at the Belle II experiment.

A positive effect of beam spot constraints and new beam spot calibration on the vertex reconstruction precision is seen via MC/data comparison.

The core part of the work focuses on studying universality of the time resolution function across nine different neutral and charged B -meson decay channels.

The possibility to use a single form of this function for all studied channels is demonstrated and supported by the consistency between the lifetime values used for simulation and obtained as results of the decay time difference fit.