This thesis deals with two independent yet closely related topics. In the first part, a measurement of branching fraction and time-dependent *CP* violation in $B^0 \to \eta_c K^0_S$, $\eta_c \to K^0_S K^\pm \pi^\mp$ decays is performed. This decay allows access to $\sin 2\phi_1$, where ϕ_1 is an angle of the unitary triangle of the Cabibbo-Kobayashi-Maskawa quark mixing matrix. The measurement is based on the entire dataset of the Belle experiment, which consists of 772×10^6 B meson pairs collected at the KEKB e^+e^- collider. The extracted mixing-induced and direct *CP*-violation parameters read $\sin 2\phi_1 \simeq \mathcal{S} = 0.59 \pm 0.17$ (stat) ± 0.07 (syst) and $\mathcal{A} = 0.16 \pm 0.12$ (stat) ± 0.06 (syst), respectively. The measured product of branching fractions $\mathcal{B}(B^0 \to \eta_c K^0_S) \times \mathcal{B}(\eta_c \to K^0_S K^\pm \pi^\mp)$ is $(9.8 \pm 0.6$ (stat) $\pm$ 0.4 (syst) ± 2.3 (int)$) \times 10^{-6}$, where the last uncertainty accounts for interference with non-resonant background.

The second part deals with the alignment of the vertex detector and the central drift chamber of the Belle II experiment at the SuperKEKB collider, which is a next-generation Super-B-Factory. With the new pixel detector and the presented alignment method, Belle II achieves approximately twice better impact parameter resolutions than Belle. The presented alignment procedure involves a simultaneous determination of about sixty thousand parameters and accounts for time-dependent detector instabilities. The method is evaluated in simulations, and its performance is validated using data recorded by the Belle II detector and in the first world-leading physics measurements.