Except for the observation of non-zero neutrino masses and the resulting phenomenon of neutrino oscillations, all existing laboratory measurements regarding the interactions of basic constituents of matter agree with the predictions of the Standard Model within the uncertainty of experimental uncertainties. Observation of the Higgs boson in 2012 by ATLAS and CMS experiments carried out at CERN was the final confirmation of the great success of the Standard Model formulated in the sixties of the last century. Despite this success, many observations indicate that the Standard Model is only an effective theory at the scale of currently available collision energy. Astrophysical and laboratory observations (dark matter, the domination of matter over antimatter in the Universe, the above-mentioned non-zero mass of neutrinos) can not be explained in the framework of MS; an extended theory containing the so-called New Physics is searched for. The measured mass of the Higgs boson and the direct search for the production of particles from outside the Standard Model on the LHC collider suggest that the direct energy scale of observation of the New Physics particles is much higher than expected. For this reason, the importance of indirect measurements, such as those carried out in the LHCb experiment, has increased significantly. . Precise indirect measurements allow one to search for effects from particles with masses significantly exceeding the available energy in proton collisions on the LHC. In indirect studies, the influence New Physics particles on phenomena at lower energy are examined, where the particles of the New Physics may appear in the form of virtual particles. Particularly interesting phenomena sensitive to this type of effects are rare decays, which are strongly suppressed within the Standard Model . Suppressed decays should be extracted from the prevailing background both from the more frequent decays and the combinatorial background.

In recent years, a wide program of searching for New Physics in the beautyhadrons sector has been conducted. These studies have yielded a number of interesting measurements whose results differ from the predictions of the Standard Model in the range of 3 or 4 standard deviations. The pattern of these anomalies seems to be consistent with some extensions of the Standard Model. The purpose of the proposed project is to search for the New Physics in the charmed barion sector. The project's tasks include search for several different decays of rare baryons Λc, which occur through an analogous type of transition as in the case of the mentioned beautiyhadron decays, where indications for the existence of the New Physics were observed. It should also be mentioned that charmed barions have not been examined so far with sufficiently high precision, and studies with sufficiently high statistics have a great potential to discover the New Physics.