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The SIDDHARTA-2 experiment: present status and future perspectives

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SIDDHARTA-2 represents a state-of-the-art experiment designed to perform dedicated measurements of kaonic atoms, which are particular atomic configurations composed of a negatively charged kaon and a nucleus. Investigating these exotic atoms provides an exceptional means to comprehend the strong interactions in the non-perturbative regime involving strangeness. At present, the SIDDHARTA-2 experiment is configured to undertake the challenging task of measuring kaonic deuterium transitions to the ground state, which has not yet been measured due to an expected lower yield and larger width with respect to kaonic hydrogen. To perform this challenging measurement, the collaboration developed a completely new apparatus, involving a large-area X-ray detector system, optimizing the signal and improving the signal-to-background ratio by gaining in solid angle, improving the timing capability, and additionally implementing a charge particle tracking veto systems. A full program of measurements beyond SIDDHARTA-2, i.e. the EXKALIBUR project, was put forward by the collaboration, to fully take advantage of the excellent conditions offered by the DAFNE collider.

An overview of the results obtained with SIDDHARTA-2 in the preparation phase will be presented as well as a short description of future measurements.

Primary author: Dr SIRGHI, Florin (INFN-LNF)

Presenter: Dr SIRGHI, Florin (INFN-LNF)

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