Contribution ID: **29** Type: **not specified**

Is there place for strangeness in the Universe? Kaonic atoms studies at the DAFNE collider with advanced X-ray detectors

Friday, 19 October 2018 09:30 (30 minutes)

I shall present a series of experiments performed during the last two decades at the DAFNE collider in Frascati devoted to the measurement of kaonic atoms using advanced X-ray detectors. The detectors which were used for these studies range from Charged Coupled Devices to two versions of spectroscopic Silicon Detectors. Combining the excellent quality kaon beam delivered by the DA□NE collider with these X ray detectors we have performed unprecedented measurements in the low-energy strangeness sector in the framework of the DEAR and SIDDHARTA Collaborations.

The kaonic atoms, as kaonic hydrogen and kaonic deuterium, provide the isospin dependent kaon-nucleon scattering lengths from the measurement of X rays emitted in the de-excitation process to the fundamental 1s level of the initially excited formed atom; these scattering lengths are key-ingredients for understanding the strong interaction. The most precise kaonic hydrogen measurement was performed by DEAR, followed by the SIDDHARTA experiments. SIDDHARTA also realized the first exploratory measurement for kaonic deuterium ever. Presently, a major upgrade of the setup, SIDDHARTA-2 was done, aiming to perform in 2019 the first precision measurement of kaonic deuterium. We plan to continue our adventure in the strangeness world by using new X-ray detectors and I hope new ideas and concepts will come from this Workshop.

Kaonic atoms studies represent an opportunity to, finally, unlock the secrets of the QCD in the strangeness sector and understand the role of strangeness in the Universe, from nuclei to the stars.

Primary author: Dr CURCEANU, Catalina Oana (LNF)

Presenter: Dr CURCEANU, Catalina Oana (LNF)

Session Classification: X-rays in nuclear physics