

Hadronic atoms spectroscopy: overview and perspectives

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I shall review the results obtained in recent years in the experimental studies of exotic atoms, in particular on hadronic atoms.

I shall mostly focus on the studies of kaonic atoms performed at the DAFNE collider of LNF-INFN and at J-PARC in Japan, which have produced a valuable wealth of data which are used by theoreticians to better understand the QCD in non-perturbative sector, with implications going from particle and nuclear physics to astrophysics.

I shall present future perspectives, including ongoing programs, as SIDDHARTA-2 at DAFNE and E57 and E62 at J-PARC, as well as plans to measure sigmonic atoms transitions and to perform dedicated measurements of kaonic atoms to solve the “charged kaon mass inconsistency”.

Hadronic atoms studies represent a unique opportunity to unlock the secrets of the QCD in the low-energy regime and to disentangle the role of strangeness in the neutron stars (equation of state of neutron stars).