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Antiprotonic Helium Structure and Spectroscopy.

Montag, 5. September 2011 10:50 (30 Minuten)

From the discovery of metastable states in the antiprotonic helium [1, 2] a spectacular progress has been achieved in precision spectroscopy of He^+pbar atoms [3, 4]. This talk will be devoted to advances in theory, which is an indispensable constituent for studying properties of antiproton and (!) electron via the spectroscopy of antiprotonic helium. Particularly, the following topics will be discussed:
1) An overview of theoretical methods to treat metastable states in the antiprotonic helium atom;
2) Fine and hyperne structure of the 3He^+pbar and 4He^+pbar atoms and determination of the antiproton magnetic moment [5];
3) Present status of theoretical studies of ro-vibrational transitions [6];
4) Near future perspectives in theory and improved determination of the electron-to-proton mass ratio.

References:
[1] M. Iwasaki et al. Phys. Rev. Lett. 67 1246 (1991).
[2] T. Yamazaki et al. Nature, 361 238 (1993).
[3] M. Hori, et al. Phys. Rev. Lett. 96, 243401 (2006).
[4] T. Pask, et al. Phys. Lett. B 678, 55 (2009).
[5] V.I. Korobov and Zh.-X. Zhong, Phys. Rev. A 80, 042506 (2009).
[6] V.I. Korobov, Phys. Rev. A 77, 042506 (2008).

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Sitzung Einordnung: 20 Years of Antiprotonic Helium

Track Klassifizierung: 20 Years of Antiprotonic Helium