DEAR - Kaonic Hydrogen: First Results

M. Cargnelli$^d$, G. Beer$^i$, A.M. Bragadireanu$^{a,e}$, C. Curceanu (Petrascu)$^{a,e}$, J.-P. Egger$^{b,c}$, H. Fuhrmann$^d$, C. Guaraldo$^a$, M. Iliescu$^a$, T. Ishiwatari$^d$, K. Itahashi$^g$, M. Iwasaki$^f$, P. Kienle$^d$, B. Lauss$^h$, V. Lucherini$^a$, L. Ludhova$^b$, J. Marton$^d$, F. Mulhauser$^b$, T. Ponta$^{a,e}$, L.A. Schaller$^b$, R. Seki$^{j,k}$, D. Sirghi$^a$, F. Sirghi$^a$, P. Strasser$^f$, J. Zmeskal$^d$

$^a$INFN - Laboratori Nazionali di Frascati; $^b$Universite de Fribourg; $^c$Universite de Neuchâtel; $^d$Institute for Medium Energy Physics, Vienna; $^e$Institute of Physics and Nuclear Engineering, Bucharest; $^f$RIKEN, Saitama; $^g$Tokyo Institute of Technology; $^h$University of California and Berkeley; $^i$ University of Victoria; $^j$California Institute of Technology; $^k$California State University

The DEAR$^1$ experiment [1] measures the energy of X-rays emitted in the transitions to the ground states of kaonic hydrogen. The shift $\epsilon$ and the width $\Gamma$ of the 1s state are related to the real and imaginary parts of the complex S-wave scattering length by the Deser Trueman formula.

Figure 1: Background subtracted energy spectrum of kaonic hydrogen. For the first time $K_{\beta}$, $K_\gamma$, $K_{\text{high}}$ are clearly resolved.

The preliminary results are: $\epsilon = -183 \pm 62$ eV and $\Gamma = 213 \pm 138$ eV. Both values are smaller then those from the previous experiment [2] and consistent with recent theoretical studies [3].

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References


$^1$DAΦNE Exotic Atom Research, conducted at the Frascati electron positron collider