

# Doubly strange stable dibaryon and hyperon production in p+C collision at 10GeV/c

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## Abstract

A reliable identification of the above events needs a multivertex kinematic analysis which is in turn feasible only using  $4\pi$ -detectors and high measurement precisions of the sought objects. The preliminary estimate of the total cross sections for  $\Lambda$  production (7200-events) is  $\sigma_{\Lambda} = 5.0$  mb. Several  $\Xi^{-} \rightarrow \Lambda + \pi^{-}$  hyperons (20-events) identified (applied ionization and kinematic fits data) in these collisions with an effective cross section of 1300-600 nb, have been found. The total cross section of H-particle production formulated with coalescence model is about  $2.6\mu\text{b}$  in Ne+Ne collisions and  $0.2\mu\text{b}$  in the p+Ne collisions at a momentum of 5 GeV/nucleon. Eight events were identified as dibaryon via a multivertex kinematic analysis. The average lifetime for a weak decay of stable dihyperons exceeds  $3.3 \cdot 10^{-10}$  s. The estimate of the dihyperon production cross section in  $p^{12}\text{C}$  -collisions at 10 GeV/c is less than 100 nb. The stable S=-2 dibaryon is confined to the following energetic level scheme: a) the  $H^0$  ground state of  $M_{H^0} = (2146.3 \pm 1.0)$  MeV/ $c^2$ ; b) the first  $H_1^0$  excited state of  $M_{H_1^0} = (2203.0 \pm 5.9)$  MeV/ $c^2$ ; c) The second excited state of heavy H with  $M_{H_2^0} = (2396.9 \pm 17.3)$  MeV/ $c^2$ . The heavy dibaryon  $H^+$  of  $M_{H^+} = (2392.6 \pm 23.6)$  MeV/ $c^2$  exists well charged counterpart. Recently we have observed two other events interpreted as a S=-2 positively charged heavy  $H^+$ -dibaryon.

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