

# Formation of $\psi'(3700)$ particles in $\pi^-$ -Cu interactions at 50 GeV/c

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(Submitted 15 July 1980)

Pis'ma Zh. Eksp. Teor. Fiz. **32**, No. 4, 297–300 (20 August 1980)

The generation cross sections of  $\psi'$  particles in  $\pi^-$ -Cu interactions have been measured at a momentum of 50 GeV/c. A value of  $0.018 \pm 0.007$  has been obtained for the quantity  $R = \sigma_{\psi'} B_{\psi' \rightarrow \mu^+ \mu^-} / \sigma_{J/\psi} B_{J/\psi \rightarrow \mu^+ \mu^-}$ .

PACS numbers: 14.40.Pe, 13.20.Jf, 13.85.Kf

The experiment was conducted on a SIGMA spectrometer,<sup>1</sup> placed in a beam of negative particles with a momentum of 50 GeV/c. The particle beam, monitored with  $S_1 S_2 S_3 S_4 A$  counters, struck a 20-cm thick copper target, placed in the pole of a magnet  $M$  (Fig. 1). Inelastic interactions in the target were detected with counters  $B_1$ ,  $B_2$ , connected in anticoincidence with the monitor. The hodoscopes  $H_4$  and  $H_5$ , placed in front of and behind a 3.5-m thick steel filter, were used to isolate events with muons in the final state. The elements of the hodoscopes  $H_4$  and  $H_5$  with dimensions of  $7.5 \times 60$  cm<sup>2</sup> and  $10 \times 100$  cm<sup>2</sup>, respectively, were arranged horizontally in two rows, forming the right and left halves of the hodoscopes. In order to detect particles flying from the target, each element of the right (left) half of hodoscope  $H_4$  was connected in coincidence with the three corresponding elements of the right (left) half of hodoscope  $H_5$ . The trigger requirement of coincidences between the right and left halves of the hodoscope  $H_4$  and  $H_5$  led to the detection of events with muons of opposite signs. The elements of the hodoscope  $H_6$  were arranged vertically and served for a more reliable identification of the muons during data analysis. The tracks of secondary particles beyond the magnet were reconstructed from the 12 coordinate planes of three wide-gap wire spark chambers.

The following criteria were used to select events of the reaction