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Hadron spectroscopy and exotics (experiment and theory)

QCD: Soft interactions

Experiment: L3 Collaboration

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# Light Resonances in $K_S^0 K^\pm \pi^\mp$ and $\eta \pi^+ \pi^-$ final states in $\gamma\gamma$ collisions at LEP

L3 Collaboration

## Abstract

The  $e^+e^- \rightarrow e^+e^- K_S^0 K^\pm \pi^\mp$  and  $e^+e^- \rightarrow e^+e^- \eta \pi^+ \pi^-$  final states are studied with the L3 detector at LEP using data collected at centre-of-mass energies from 183 GeV up to 202 GeV. The mass spectrum of the  $K_S^0 K^\pm \pi^\mp$  final state shows an enhancement around 1470 MeV, which is identified with the pseudoscalar meson  $\eta(1440)$ . This state is observed in  $\gamma\gamma$  collisions for the first time and its two-photon width is measured to be  $\Gamma_{\gamma\gamma}(\eta(1440)) \times \text{BR}(\eta(1440) \rightarrow K\bar{K}\pi) = 212 \pm 50(\text{stat}) \pm 23(\text{sys})$  eV. Clear evidence is also obtained for the formation of the axial vector mesons  $f_1(1420)$  and  $f_1(1285)$ . In the  $\eta \pi^+ \pi^-$  channel the  $f_1(1285)$  is observed, and upper limits for the formation of  $\eta(1440)$  and  $\eta(1295)$  are obtained.

Version 1

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