τ Decays with η, f_1 & $3\pi^{\pm}3\pi^0$

CLEO Analyzes $\sim 4.3\times 10^6$ prod. $\tau^+\tau^-$ Search for:
$\eta \to \gamma\gamma, 3\pi^0$ $f_1(1285) \to \pi^+\pi^-\eta, 2\pi^0\eta$ $\eta'(958) \to \pi^+\pi^-\eta$

Main Experimental Points:

- π^0/η Finding: Excellent Ang & E–Res of Calo.
  $S^X_{\gamma\gamma} \equiv (M_{\gamma\gamma} - M_X)/\sigma_{\gamma\gamma}$ $\sigma_{\gamma\gamma} \sim 12$ MeV
- $q\bar{q}$ Background
  - Use 1–1 & 1–3 Topologies + Kinematics
  - Study Data: High Mass in Tag Hemi.

Sample	N_{signal}	$\varepsilon(\%)$	BR (10^{-4})
$3\pi^{\pm}\eta_{\gamma\gamma}$	$73.4^{+13.0}_{-12.3}$	6.3	$5.3^{+1.4}_{-1.3} \pm 1.8$
$f_1\pi^{\pm} \to 3\pi^{\pm}\eta_{\gamma\gamma}$	$36.3^{+9.7}_{-9.0}$	5.6	$3.5^{+0.7}_{-0.6} \pm 1.0$*
$3\pi^{\pm}\eta_{3\pi^0}$	$15.2^{+4.8}_{-4.6}$	1.8	$6.8^{+4.0}_{-3.3} \pm 2.2$
$f_1\pi^{\pm} \to 3\pi^{\pm}\eta_{3\pi^0}$	$9.6^{+5.6}_{-4.7}$	1.4	$3.1^{+0.9}_{-0.9} \pm 1.0$*
$\pi^{\pm}2\pi^0\eta_{\gamma\gamma}$	$15.0^{+5.0}_{-5.0}$	2.5	$6.6^{+2.5}_{-2.5} \pm 2.3$
$f_1\pi^{\pm} \to \pi^{\pm}2\pi^0\eta_{\gamma\gamma}$	$8.4^{+3.2}_{-3.2}$	2.6	$1.4^{+0.6}_{-0.6} \pm 0.3$*
$\pi^{\pm}\eta'$	2[1]	4.4	<0.74 (90%CL)
$\pi^{\pm}\pi^0\eta'$	0[1]	2.3	<0.80 (90%CL)
$3\pi^{\pm}3\pi^0$	38.2 ± 3.4	2.1	$2.85\pm0.56\pm0.51$
$\pi^{\pm}2\pi^0\omega$	$19.4^{+6.8}_{-6.1}$	1.9	$1.89^{+0.74}_{-0.67} \pm 0.40$*

* First Measurement

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