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A Study of e+ e- -> pi+ pi- pi0 pi0 at 3.090 GeV Center of Mass Energy*

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THESIS

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WE HEREBY RECOMMEND THAT THE THESIS BY

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A STUDY OF $e^+e^- \to \pi^+\pi^-\pi^0\pi^0$ AT 3.090 GEV CENTER OF MASS ENERGY

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Department of Physics
University of Illinois at Urbana-Champaign, 1993
Jon J. Thaler, Advisor

The process $e^+e^- \to \pi^+\pi^-\pi^0\pi^0$ is studied at a center of mass energy of 3.090 GeV, the J/ψ center of mass energy, by the **Mark III** detector at SPEAR. The branching ratios for $\psi \to \pi^+\pi^-\pi^0\pi^0$ and several background process are measured: $\psi \to \pi^+\pi^-\pi^0\pi^0\pi^0$, $\psi \to K^\pm K^\mp\pi^0\pi^0$, and $\psi \to K^\pm\pi^\mp\pi^0\pi^0$. Upper limits on $e^+e^- \to \rho^+\rho^-$ are derived. Evidence is presented that the isobar model of low-energy hadronic interactions may not apply to $e^+e^- \to \pi^+\pi^-\pi^0\pi^0$. Suggestions for further research are made.

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