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The Search for $K_L \to \pi^0\pi^0\gamma$ DSVID SMITH, University of Virginia, KTEV COLLABORATION — This talk describes a search for the rare decay $K_L \to \pi^0\pi^0\gamma$ conducted using data from the KTeV experiment. KTeV is a high-energy physics experiment that ran at Fermilab from 1997 to 1999, dedicated to searching for rare K_L decays and to extracting CP violation parameters such as $\frac{\epsilon'}{\epsilon}$. The decay $K_L \to \pi^0\pi^0\gamma$ is an electric quadrupole (E2) decay that is forbidden to fourth order in Chiral Perturbation Theory, and is interesting as a probe of the theory to the sixth order. Howver, the decay is experimentally hard to find due to a large background of $K_L \to 3\pi^0$ decays with one missing photon. The data sample used consisted of events with one of the internal photons converting to a Dalitz pair; this was done because of the sensitivity of the KTeV charged trigger. The primary background mode consisted of $K_L \to 3\pi^0$ events with one missing photon; a subsample of this mode, in which the missing photon was assumed to go down a calorimeter beam hole, was used as a normalization mode due to the similar topology and large number of events. Both the 1997 and 1999 KTeV data was used in a blind analysis to conduct the search for $K_L \to \pi^0\pi^0\gamma$ outlined in this talk.

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