Rare K_S decays at NA48/1

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Using data taken in 2002 at the CERN SPS accelerator, the NA48/1 collaboration has made the first observation of the following rare decays: $K_S \to \pi^0 e^+ e^-$ [1] and $K_S \to \pi^0 \mu^+ \mu^-$ [2]. Seven events were found in the electron channel, with an estimated background of $0.15^{+0.10}_{-0.04}$. For the muon channel 6 events were observed, with a background of $0.22^{+0.13}_{-0.11}$. Using a vector matrix element with unity form factor, the resulting branching ratios are:

$$\mathrm{BR}(K_S \to \pi^0 e^+ e^-) = [5.8^{+2.8}_{-2.3}(\mathrm{stat}) \pm 0.8(\mathrm{syst})] \times 10^{-9}$$
$$\mathrm{BR}(K_S \to \pi^0 \mu^+ \mu^-) = [2.8^{+1.5}_{-1.2}(\mathrm{stat}) \pm 0.2(\mathrm{syst})] \times 10^{-9}.$$

The talk will mainly review the data analysis strategy followed to treat the potential background sources. Also the implications of these measurements for the CP violating component of $K_L \to \pi^0 l^+ l^-$ will be discussed.

[1] J.R.Batley *et al.*, Physics Letters B576 (2003) 43.

[2] Preliminary result. To be submitted for publication in Physics Letters.

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