$$\tau^+ \to \bar{\nu}_\tau + e^+ + \nu_e$$

$$\tau^- \to \nu_\tau + e^- + \bar{\nu}_e$$

leading to

$$\tau^+ + \tau^- \to e^+ + e^- + \text{missing energy} \quad , \tag{7}$$

and an analogous sequence for the μ decay modes. A student of mine, Frank Heile[37], did find some weak evidence for the process in Eq. 7, but the background from radiative Bhabha pairs was a severe problem. Incidentally, the great improvement in detectors in 15 years is illustrated by contrasting this measurement with the beautiful determination of $B(\tau^- \to \nu_\tau + e^- + \bar{\nu}_e)$ by Akerib *et al.*[38] using the CLEO II detector and the process in Eq. 7.

J. ANOMALOUS MUON EVENTS

The first advance beyond the $e\mu$ events came with three different demonstrations of the existence of anomalous $\mu-$ hadron events

$$e^+ + e^- \to \mu^\pm + \text{hadrons} + \text{missing energy}$$

The first and very welcome outside confirmation of anomalous muon events came in 1976 from another SPEAR experiment by Cavalli-Sforza *et al.*[39] This paper was entitled "Anomalous Production of High-Energy Muons in e^+e^- Collisions at 4.8 GeV".

I have in my files a June 3, 1976 Mark I note by Gary Feldman discussing μ events using the muon identification tower of the Mark I detector, Fig. 5a. For data acquired above 5.8 GeV he found the following:

> "Correcting for particle misidentification, this data sample contains 8 μe events and 17 $\mu-$hadron events. Thus, if the acceptance for hadrons is about the same as the acceptance for electrons, and these two anomalous signals come from the same source, then with large errors, the branching ratio into one observed charged hadron is about twice the branching ratio into an electron. This is almost exactly what one would expect for the decay of a heavy lepton."