

# Estimate of Random Kink

## Background

### Introduction

The high density of through going muons in the emulsion data can give rise to a background to the tau sample, by randomly associating vertex tracks with one of the muon tracks. Only the muon tracks that appear to *start* within the allowed decay volume can be incorrectly linked to those vertex tracks that appear to *stop* within the volume. This memo documents the computation of this background, using data from the set of 203 events.

### Method

#### *Outline*

The estimation of the random kink background is computed from the product of the starting muon track density,  $\rho$ , the allowed radius for matching tracks,  $r_{match}$ , the number of vertex tracks that stop in the decay volume,  $N_{stop}$ , the probability of matching the muon track to the SFT data,  $P_{SFT}$ , and the fraction of random kinks that have a “transverse momentum” greater than 250 MeV/c,  $P_{250}$ .

$$N_{random} = \rho \cdot r_{match} \cdot N_{stop} \cdot P_{SFT} \cdot P_{250}$$



