# 1 The Trackers

## 1.1 The Hardware

MICE is equipped with two identical, high precision scintillating-fibre ("scifi") trackers, described in [1]. Each tracker is placed in a superconducting solenoid designed to provide a uniform field over the tracking volume. One tracker, TKU, is upstream of the cooling cell, the other, TKD, downstream. Each tracker consists of five detector stations, labelled 1 to 5, with the stations placed varying distances apart to help resolve ambiguities. The trackers are placed symmetrically about the cooling cell, with station 1 the nearest to the cooling cell for both.

Each station is formed of three planes of $350\mu m$ scintillating-fibres, orientated at 120 degrees to one another. Each plane consists of two layers. The fibres in each plane butt up to each other and the two layers are offset with respect to each other by a fibre radius. A charge particle will then deposit energy in at least $350\mu m$ of scintillator, providing uniform response over the whole station face. The doublet layers are glued to a sheet of mylar and the fibres are adjacent groups of seven fibres form one read-out channel. The three views are referred to as U, V and W, with the order being identical for each station and the U fibres running vertically.

The light from the seven scintillating fibres passes into a single clear fibre, which takes it to a visible light photon counter (VLPC) which operate at 9k. The signal from the VLPCs is digitised using electronics developed by the D0 collaboration[2].

## 1.2 Tracker Performance and Reconstruction

### 1.2.1 Low Level Analysis

Low level analysis including digits, to spacepoints 50% LiH full 50% empty (2 runs), 2 pages, Melissa U.

### 1.2.2 Noise

Noise at electronics level discussion, 1/2 page, Chris H and Noise from data, 1/2 page, Chris H

### 1.2.3 Track Finding Efficiency

Track selection/Kalman, efficiency (from all data runs plotted by pt and if all equal just 10mm can be shown) resolution (from MC), reference MAUS and Tracker SW paper, 1 page, Chris H.

## 1.3 Tracker Efficiency Evolution

Tracker efficiency with time (maybe 1 runs every 3 months since start shown?), 1/2 page, Paul K.

# References


[1] M. Ellis, P. Hobson, P. Kyberd, J. Nebrensky, A. Bross, et al., "The Design, construction and performance of the MICE scintillating fibre trackers," Nucl. Instrum. A659 (2011) 136?153, arXiv:1005.3491 [physics.ins-det].

[2] S. Abachi et al., "The D0 Detector," Nucl. Instrum. Meth. A338 (1994) 185.