TRIUMF Experiment E614

Time Spread of a Single Electron in DC4 at $B = 2T$

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20 May 2004

The time spread for a positron *track* depends on several reasons which have been estimated in TN81 (see Table 2). The $\sigma_{track} = 2 - 100ns$ change depends on a travel distance (see TN81, Figs. 38,39).

Konstantin said me couple days ago that a time spread σ of *each* electron in GEANT is constant value of $\sigma = 2 - 3ns$. It is the long time *misunderstanding* of course.

Therefore I have calculated a time spread of an one electron because a diffusion. The calculations have been done along line between two wires in DC4. One can see the result in Fig.1. Contribution of the diffusion is zero at $t = 0$. Cluster statistics gives a maximal contribution at $t = 0$. GEANT calculates this statistics.

My proposal is to introduce in GEANT the time spread function from Fig.1. Contribution of cluster statistics only will be calculated in few days. I belive the spread $\sigma = 3ns + RMS(t)$ from Fig.1 will be a better approximation than the existing number of $\sigma = 3ns$.

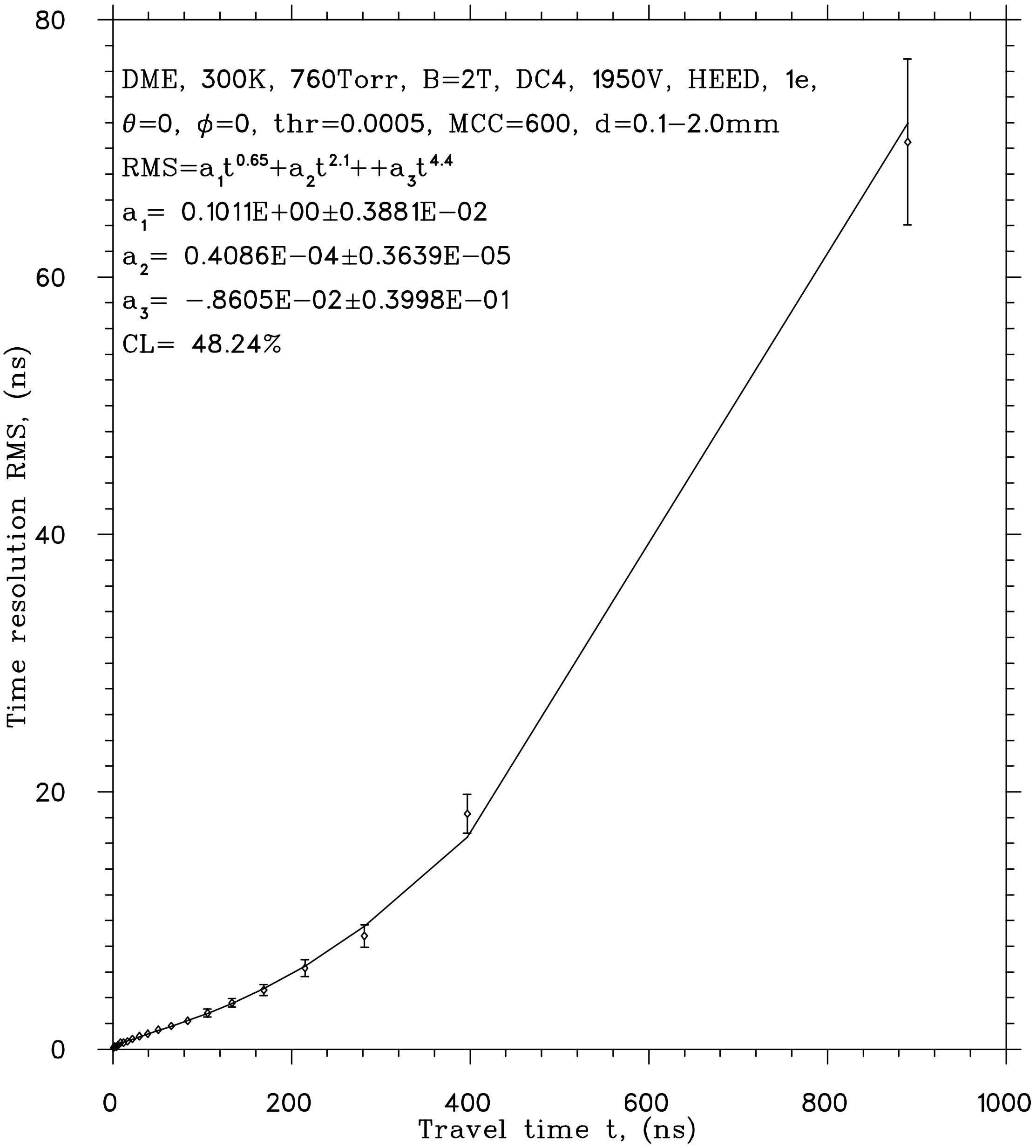

Figure 1: Time spread of single electron in DC4. Detailes see in the text.