



Figure 1: Time difference between DOM 1 and DOM 2 for an operational LED in DOM 1, Nano Beacon pulsed at 1 kHz for 30 min. The expected light travel time of 160.5 ns has already been subtracted

## 1 Coincidences

A coincidence is defined as an ensemble of hits within a time window of  $\Delta T_{\text{coincidence}} = 20$  ns. The size of a coincidence is the number of hits which it is composed of. The time of a coincidence is defined as the time of the earliest hit which is part of the coincidence.

## 2 Inter DOM Calibration

In order to calibrate the time difference between DOMs a LED (Nano Beacon) with a wavelength of 470 nm is installed in each DOM. The Nano Beacons are positioned in the top half of a DOM pointing to the next DOM on the string. For calibration purposes they are operated at a rate of 1000 Hz and the intensity is tuned in order to illuminate the next DOM on the string without invoking a High Rate Veto. Once per day two special calibration runs are taken in which the LEDs of DOM 1 and DOM 2 are operated. The time calibration is then performed on each of these data sets using the DOM with the flashing nanobeacon and the DOM directly on top of it. The time differences of coincidences on these DOMs of at least 2 hits (typical 10-20 hits) are filled into a histogram and the distribution is fitted with a gaussian as shown in figure 1. The relative time offsets between the three DOMs as determined by this procedure is then applied to the data. Applying this to DOM 2 and DOM 3 the time calibration relative to DOM 1 is obtained.