that were used for the analysis is sampled\textsuperscript{8} in order to include any fluctuations in the background signal during the running period.

Since an arbitrary amount of accidental data can be generated, these data must properly be scaled before subtracting from the total coincidence data. The next section will address this issue.

7.2.2.1 Proper scaling of the Accidental Data

In order to scale the data we need to use a quantity which cannot be related to pion production, and if possible, which represents an impossible event. At this point using the negative neutron times shown in figure 7-2 can be a starting point.

Thus, it is very useful to construct the same histogram for the accidental analysis. Figure 7-16 shows the neutron time of flight from the LH\textsubscript{2} target obtained by using exactly the same procedure. The scale is chosen such that it can be directly compared with figure 7-2.

\begin{figure}
\centering
\includegraphics[width=0.5\textwidth]{figure7-16}
\caption{The time of flight of the product neutron from LH\textsubscript{2} target to the detector for accidental coincidences. $\theta_p = 12^\circ$, $\theta_n = 24^\circ$, $T_{\text{beam}} = 500 \pm 25$ MeV.}
\end{figure}