1. Data Analysis

The "standard" technique is to locate a well-reconstructed track from the electronic tracking detector into the emulsion stack, and follow this track until it ends at the interaction vertex. This method, also used in the CHORUS experiment, is appropriate for only about 50% of the data in DONUT. Because the emulsion targets are very thick, 6 cm, this method of following tracks from the spectrometer is less reliable for vertices in the upstream part of the target because of secondary interactions, electron showers, and scattering. A second method is used for upstream or complex events where the position of the vertex is poorly known. In this method, automatic emulsion scanning stations are programmed to find all tracks in a *volume* of emulsion surrounding the interaction prediction. These data are then processed by finding all 3-track vertices in this volume. For each DONUT event processed in this way, there are up to 10^4 tracks found in every 5 cm^3 of target emulsion. Almost all of these tracks are from background particles, and will not produce the proper topology of a neutral vertex. This powerful method is possible only because of the speed of the present scanning stations. Nevertheless, until March 1999, it required more than 10 hours to process one event in this way. Today at Nagoya University the next generation scanning machines are now on-line, and have proven speed increases of 8 to 10 over the previous generation.