## This is a document explaining what each figure shows in the Scifi official plots. The word "jun99" of each file name means that the figure contains only June data in 1999.

**muon_energy_jun99.ps**

:The 1st page shows observed muon energy spectrum for Data and MC (MC histogram is normalized to DATA) events which have muon tracks in both Scifi and Muon chamber detector. The cross points and boxes with statistical error are Data and MC, respectively. The 2nd page shows ratios of Data/MC as a function of measured muon energy.

**muon_energy_double_jun99.ps**

:The 1st page shows observed muon energy spectrum for Data and MC (MC histogram is normalized to DATA) events which have muon tracks in both Scifi and Muon chamber detector and one short track associated with the muon long track ("tow-track" events). The selection criteria to select those events are described later (see the explanation in "num_of_track_jun99.ps"). The 2nd page shows ratios of Data/MC as a function of measured muon energy.

**muon_energy_double_jun99.2.ps**

:The figure shows observed muon energy spectrum for Data and MC (MC histogram is normalized to DATA) events which have muon tracks in both Scifi and Muon chamber detector and one short track associated with the muon long track ("tow-track" events). The MC histogram is divided to Q.E.(quasi-elastic, blank) and non-Q.E. (hatched) events. The selection criteria to select those events are described later (see the explanation in "num_of_track_jun99.ps").

**muon_energy_qecand_jun99.ps**

:The 1st page shows observed muon energy spectrum for Data and MC (MC histogram is normalized to DATA) events which have muon tracks in both Scifi and Muon chamber detector and one short track associated with the muon long track ("tow-track" events), which is a recoil proton candidate. The selection criteria to select those events are described later (see the explanation in "num_of_track_jun99.ps" and "second_trk_deltatheta_jun99.ps"). The 2nd page shows ratios of Data/MC as a function of measured muon energy.

**muon_energy_qecand_jun99.2.ps**

:The 1st page shows observed muon energy spectrum for Data and MC (MC histogram is normalized to DATA) events which have muon tracks in both Scifi and Muon chamber detector and one short track associated with the muon long track ("tow-track" events), which is a recoil proton candidate. The MC histogram is divided to Q.E.(quasi-elastic, blank) and non-Q.E. (hatched) events. The selection criteria to select those events are described later

(see the explanation in "num_of_track_jun99.ps" and "second_trk_deltatheta_jun99.ps").

**muon_energy_single_jun99.ps**

:The 1st page shows observed muon energy spectrum for Data and MC (MC histogram is normalized to DATA) events which have muon tracks in both Scifi and Muon chamber detector and no short track associated with the muon long track ("single-track" events). The selection criteria to select those events are described later (see the explanation in "num_of_track_jun99.ps"). The 2nd page shows ratios of Data/MC as a function of measured muon energy.

**muon_energy_single_jun99.2.ps**

:The figure shows observed muon energy spectrum for Data and MC (MC histogram is normalized to DATA) events which have muon tracks in both Scifi and Muon chamber detector and no short track associated with the muon long track ("single-track" events). The MC histogram is divided to Q.E.(quasi-elastic, blank) and non-Q.E. (hatched) events. The selection criteria to select those events are described later (see the explanation in "num_of_track_jun99.ps").

**muon_theta_jun99.ps**

:The 1st page shows observed angle between neutrino beam and muon for Data and MC (MC histogram is normalized to DATA) events which have muon tracks in both Scifi and Muon chamber detector. The cross points with statistical error and histogram are Data and MC, respectively. The 2nd page shows ratios of Data/MC as a function of measured muon energy.

**muon_theta_double_jun99.ps**

:The 1st page shows observed angle between neutrino beam and muon for Data and MC (MC histogram is normalized to DATA) events which have muon tracks in both Scifi and Muon chamber detector and one short track associated with the muon long track ("tow-track" events). The cross points with statistical error and histogram are Data and MC, respectively. The 2nd page shows ratios of Data/MC as a function of measured muon energy.

**muon_theta_qecand_jun99.ps**

:The 1st page shows observed angle between neutrino beam and muon for Data and MC (MC histogram is normalized to DATA) events which have muon tracks in both Scifi and Muon chamber detector and one short track associated with the muon long track ("tow-track" events), which is a recoil proton candidate. The cross points with statistical error and histogram are Data and MC, respectively. The 2nd page shows ratios of Data/MC as a function of measured muon energy.

| Number of tracks | Number of events(Data) Jun, 1999 |
|---|---|
| 1 | 246 |
| 2 | 61 |
| 3 | 7 |
| 4 | 1 |

**muon_theta_single_jun99.ps**

:The 1st page shows observed angle between neutrino beam and muon for Data and MC (MC histogram is normalized to DATA) events which have muon tracks in both Scifi and Muon chamber detector and no short track associated with the muon long track ("single-track" events), The cross points with statistical error and histogram are Data and MC, respectively. The 2nd page shows ratios of Data/MC as a function of measured muon energy.

**num_of_track_jun99.ps**

:This figure shows a distribution of number of tracks in a event (i.e. muon long track + associated short track). The cross points are data and, the blank and hatched histogram are Q.E. and non-Q.E. events in MC. The way to calculate number of tracks is as follow.

(a)At first, three variables are defined; $d_{trk}$ : three dimensional distance between muon long track which was tagged by the Muon chamber detector and second track candidate, $d_{str}$ : distance between the muon track and the second track candidate in a plane including the start point of the second track, which is perpendicular to the neutrino beam direction, $d_{stp}$ : distance between the muon track and the second track in a plane including the end point of second track, which is also perpendicular to the neutrino beam direction.

(b)The second track candidate which satisfys following condition is selected;

$$d_{trk} < 5cm \tag{1}$$

$$d_{str} < 20cm \tag{2}$$

$$d_{stp} > 25cm \tag{3}$$

(c)If more than 2 tracks satisfy the condition (b), the track which has the most smallest $d_{trk}$ is selected as the second track.

Table  shows the number of events (Data) for each number of tracks.

**second_trk_deltatheta_jun99.ps**

:This figure shows $\cos\Delta\theta$ distribution, where $\Delta\theta$ is angle between the observed second track and an expected proton track which can be predicted from observed muon kinematics (i.e. total energy and angle with respect to the neutrino beam direction) by assuming Q.E.

scattering. The events that number of tracks equals 2 in the "num_of_track_jun99.ps" are only used. The histogram of MC is divided to Q.E. and non-Q.E. events. The events used in the figures "muon_energy_qecand_jun99.ps", "muon_energy_qecand_jun99.2.ps" and "muon_theta_qecand_jun99.ps are those satisfying $\cos\Delta\theta >= 0.95$, and total number of events is 22.