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Charged Hadron and Lepton Currents Produced by Low-Momentum (≤ 3 GeV/c) Charged Pions in Al, Fe, and Pb Targets

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Abstract

Calculations have been carried out to determine the spatial dependence of charged hadron and lepton currents produced by low-momentum ($\leq$ 3 GeV/c) charged pions in Al, Fe, and Pb targets. Even at the lowest momentum values considered (0.5 GeV/c), there is little difference between incident positive pions and negative pions with respect to the average spatial dependence of the charged current.

In the design of high-energy nuclear instrumentation such as proportional wire chambers which detect charged particles, it is desirable to have an estimate of the average number of charged particles produced as a function of spatial position. The code[1] HETC with CALOR[2] has been utilized to determine the spatial dependence of charged hadron and lepton currents*† produced by low-momentum ($\leq$ 3 GeV/c) charged pions in Al, Fe, and Pb targets. The data presented here are for a zero-width, zero-angular-spread beam of normally incident pions. No gaps have been introduced at the spatial positions where the charged particles are detected. Presented in Figs. 1-3 are the laterally integrated number of charged particles (protons, $\pi^{\pm}$, $\mu^{\pm}$, $e^{\pm}$) crossing selected boundaries in the three different targets for four different energies. The curves drawn through the data points are hand-drawn and are not intended to represent a best fit to the data. The general trend noted in these data is that for increasing A number of the target there is a decrease in the number of charged particles. Presented in Figs. 4-6 are the individual contributors to the total current in the Al, Fe, and Pb targets, respectively, for incident 2-GeV/c π^{+}. In these data the general trend is that for increasing A number there is a dramatic decrease in the lepton current.

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*Electrons from muon decay are not included due to the time scale associated with the production of these particles. Also, electrons and positrons resulting from the low-energy electromagnetic cascades generated by excitation gamma rays are not included. This, however, should be a relatively small effect.

†Current is defined here to mean the number of particles crossing a given boundary regardless of the direction.

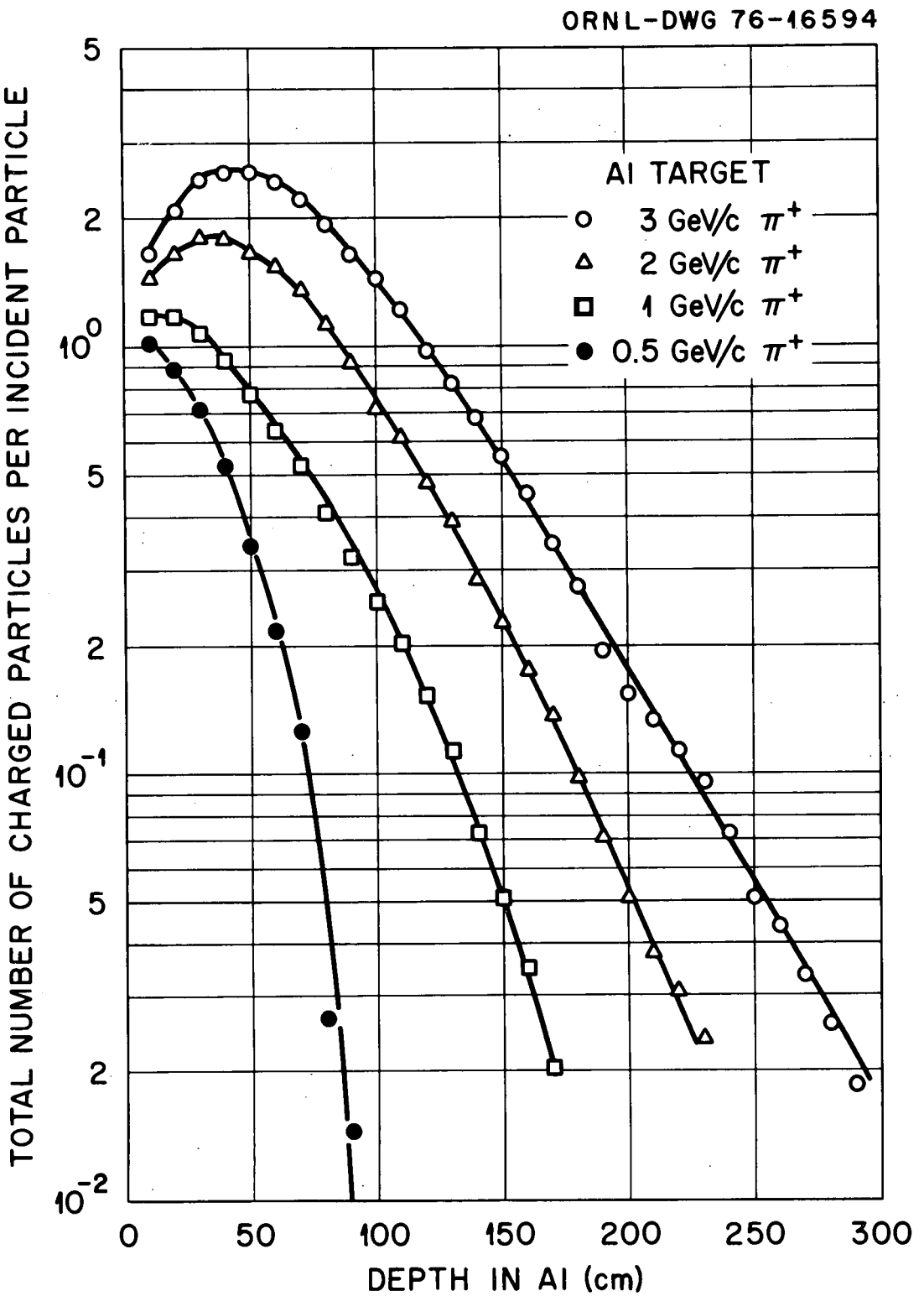

Fig. 1. Laterally integrated charged-particle currents in an Al target due to incident 0.5-, 1.0-, 2.0-, and 3.0-GeV/c π^+.

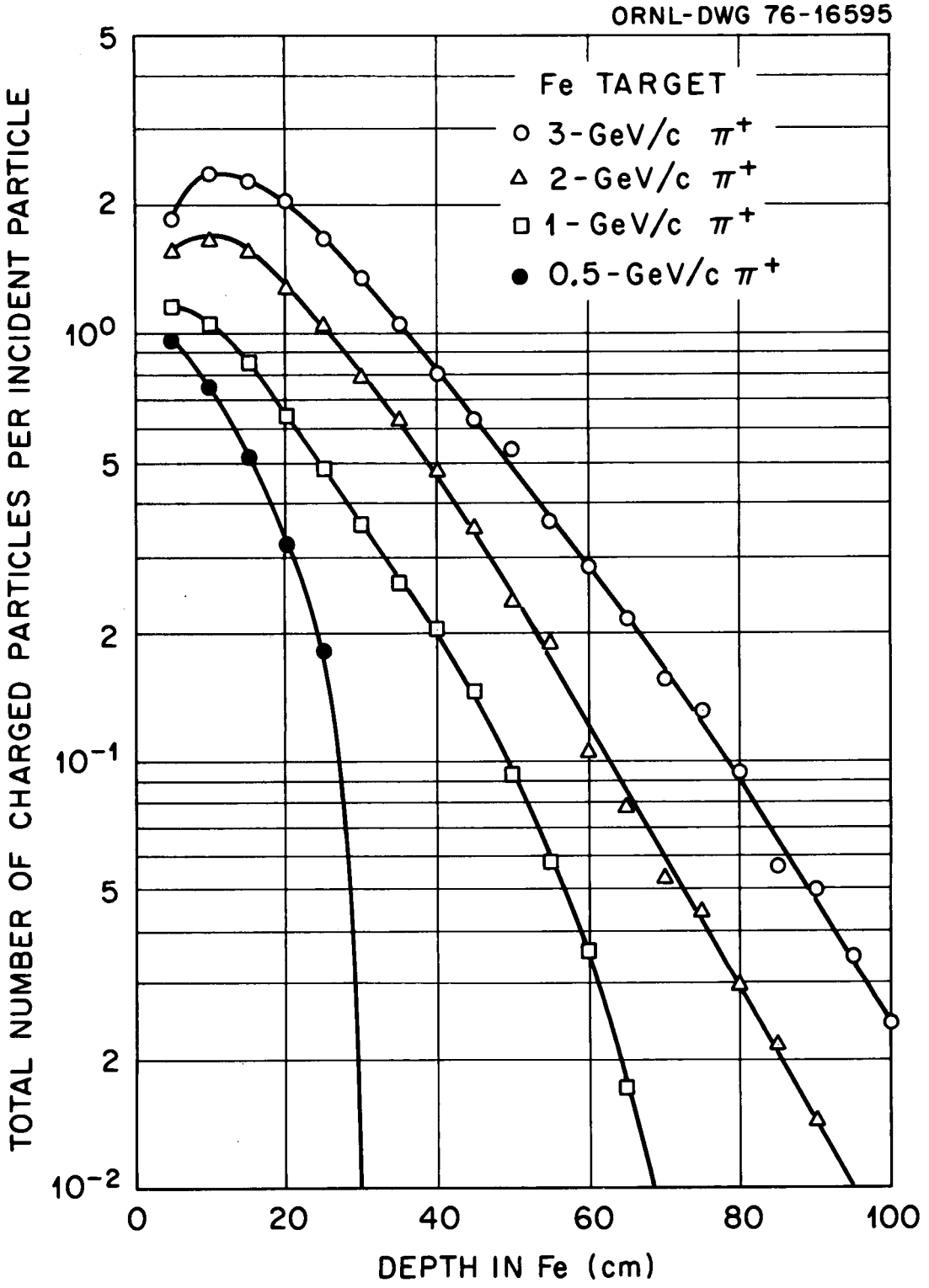

Fig. 2. Laterally integrated charged-particle currents in an Fe target due to incident 0.5-, 1.0-, 2.0-, and 3.0-GeV/c π^+.

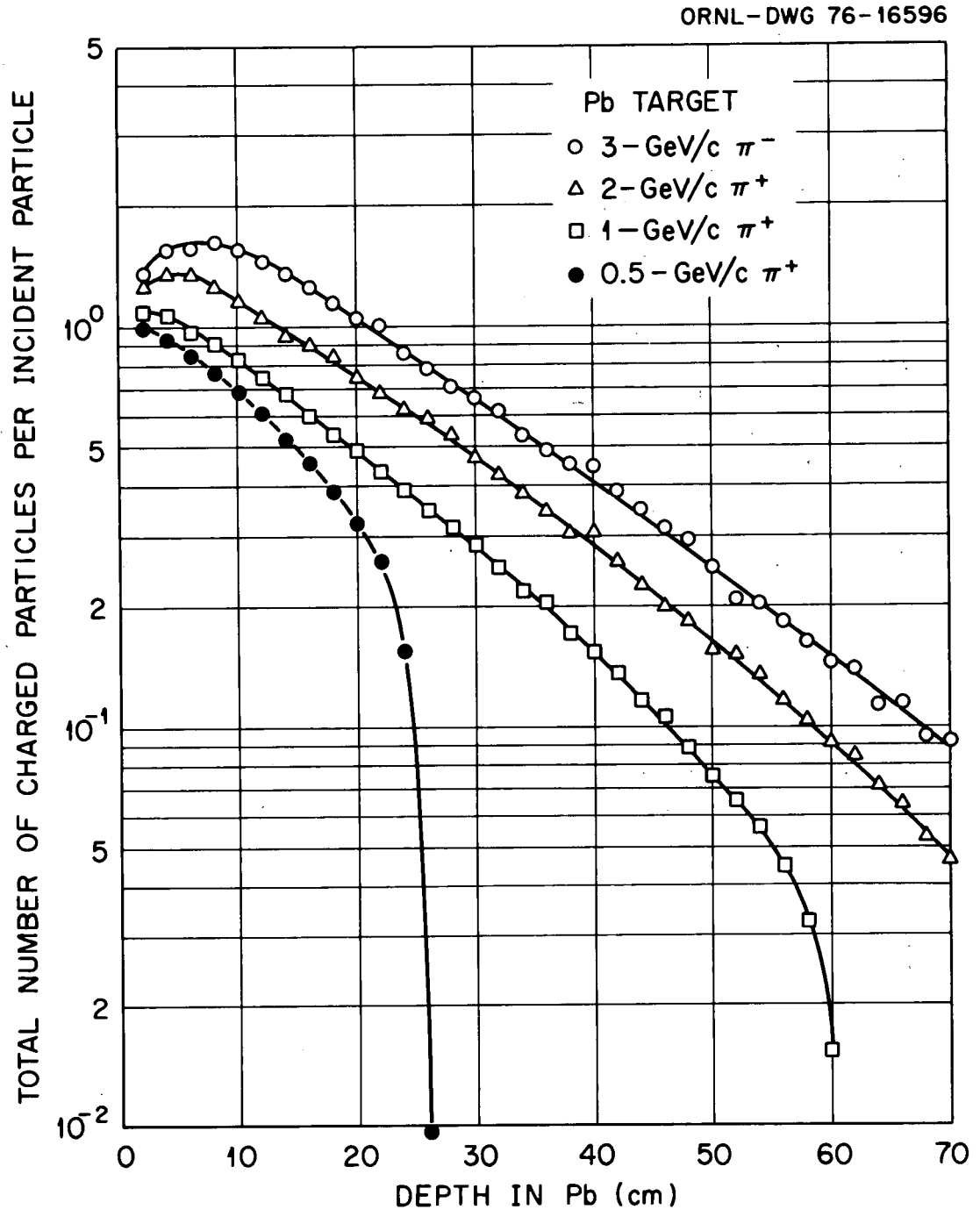

Fig. 3. Laterally integrated charged-particle currents in a Pb target due to incident 0.5-, 1.0-, 2.0-, and 3.0-GeV/c π^+.

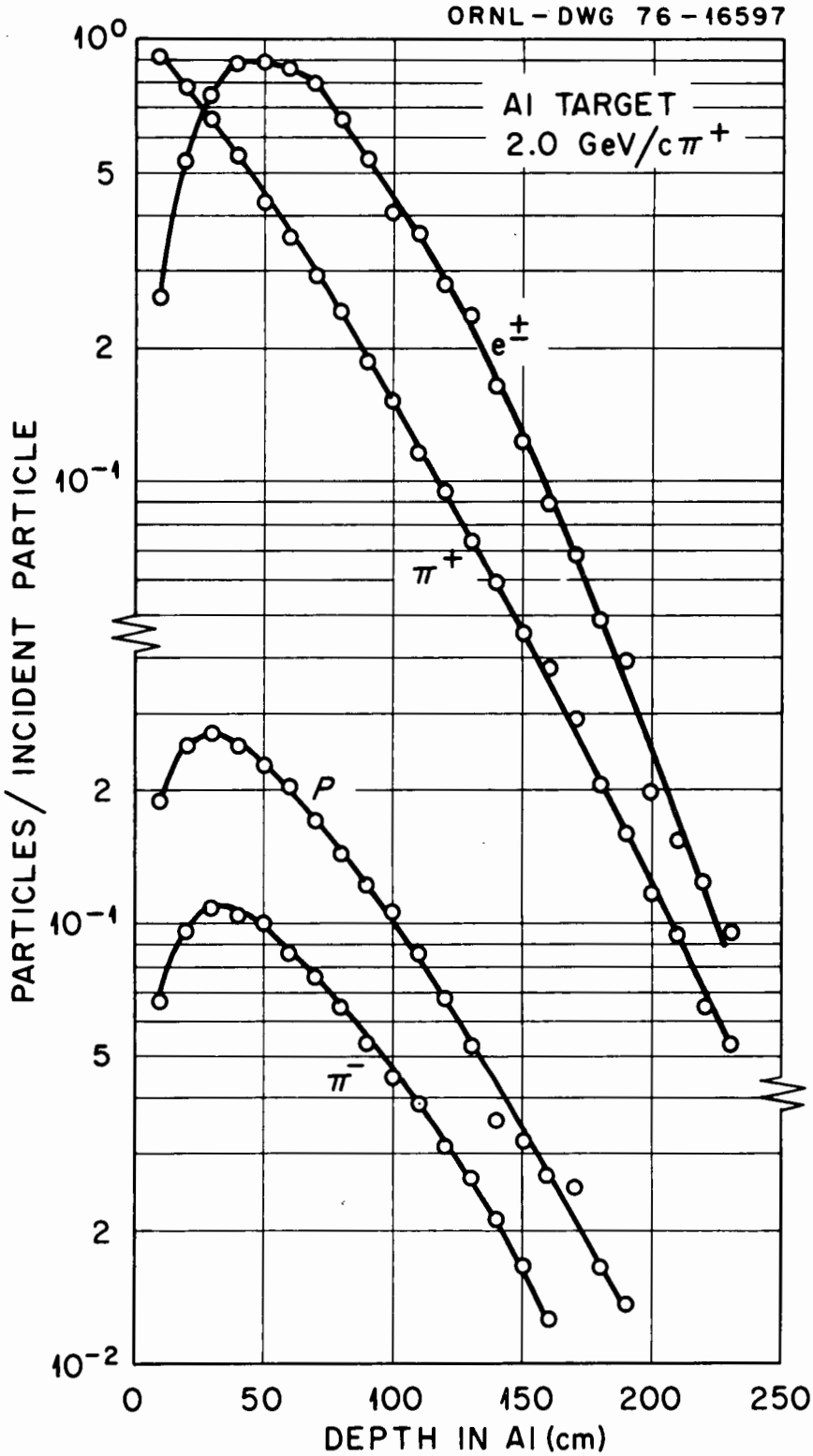

Fig. 4. Laterally integrated individual contributors to the charged-particle current in an Al target due to incident 2.0-GeV/c π^+.

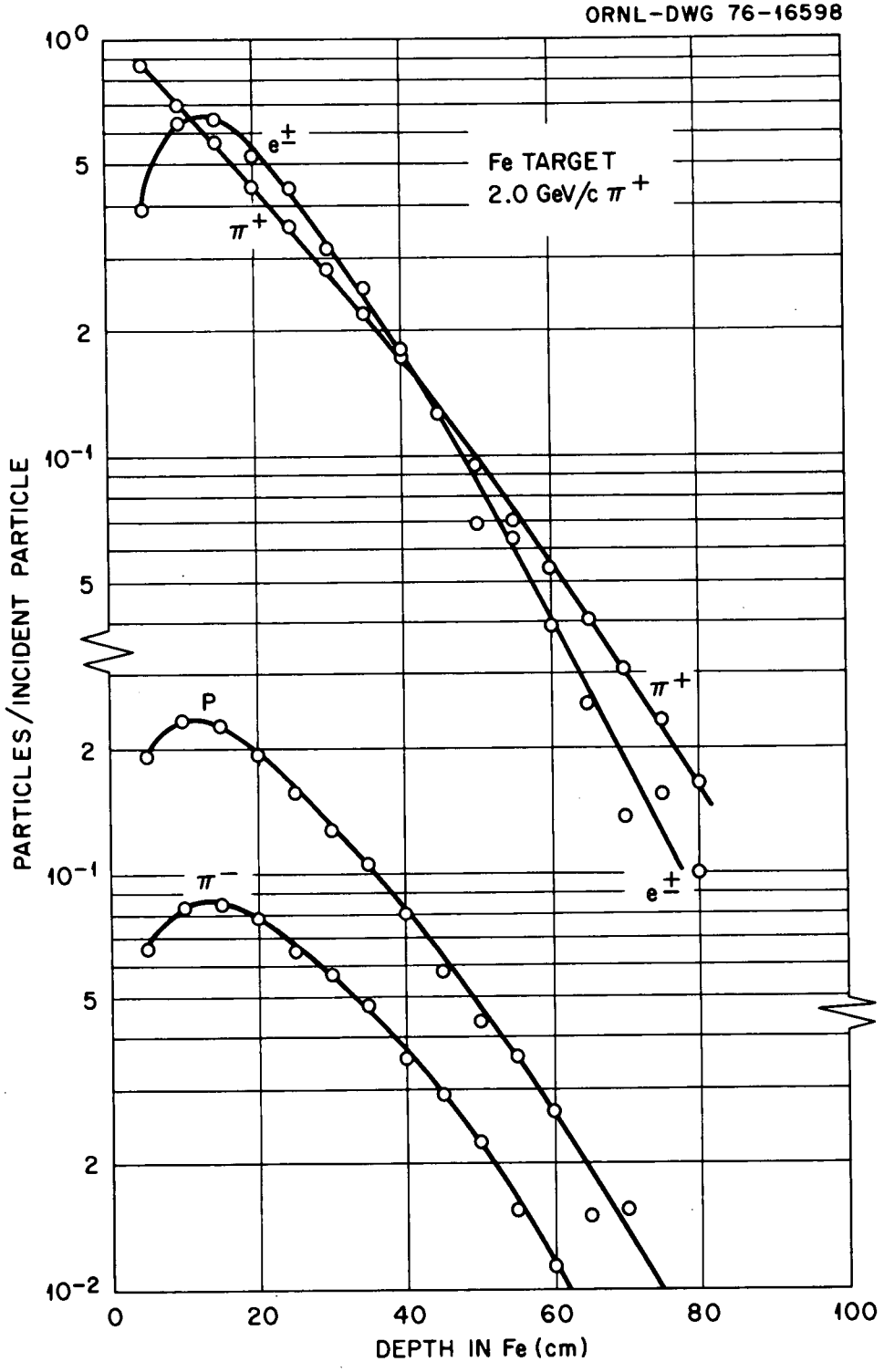

Fig. 5. Laterally integrated individual contributors to the charged-particle current in an Fe target due to incident 2.0-GeV/c π^+.

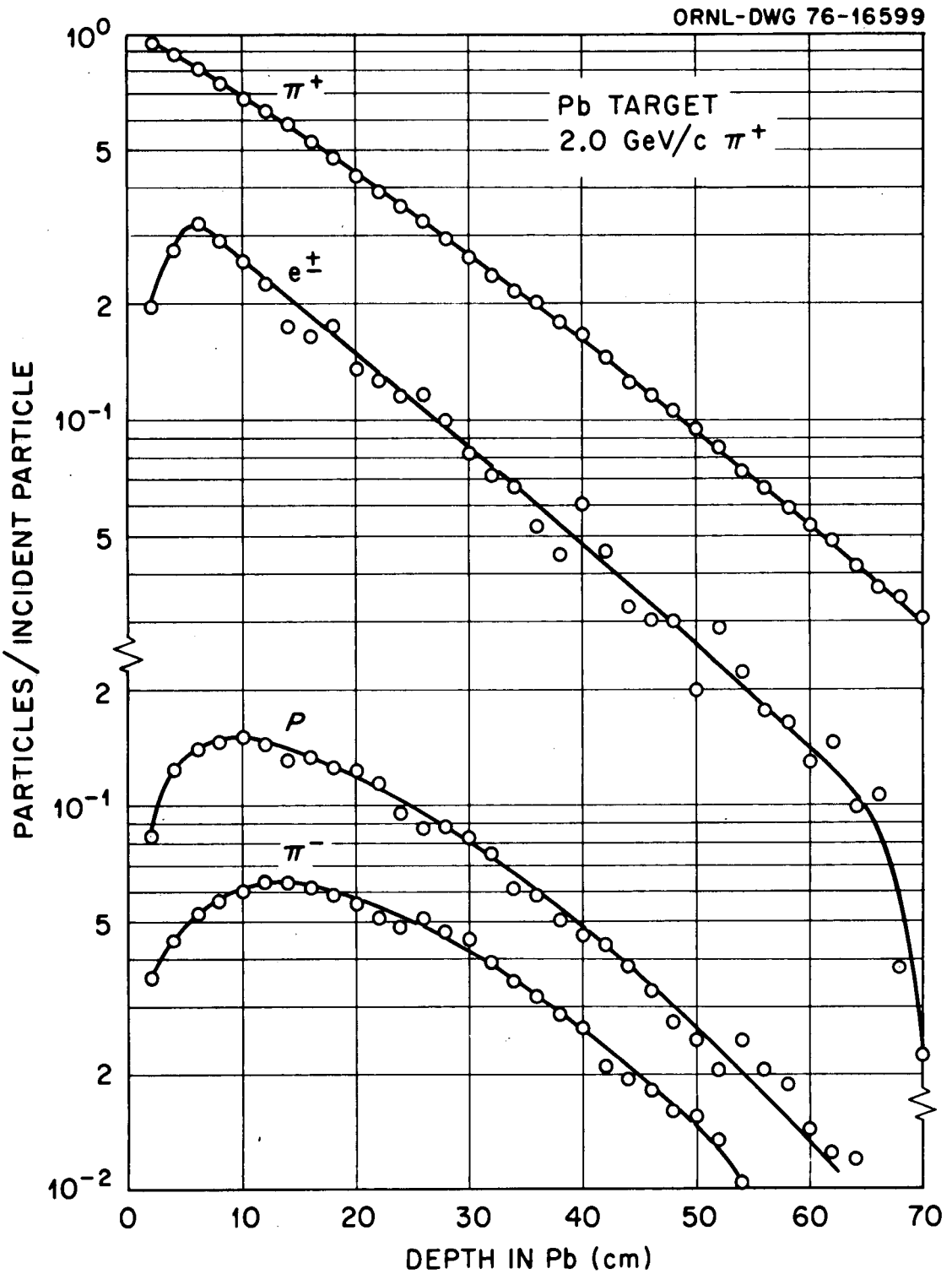

Fig. 6. Laterally integrated individual contributors to the charged-particle current in a Pb target due to incident 2.0-GeV/c π^+.

The radial dependences for all energies, targets, and particles considered are given in Tables 1 - 18. By comparing the π^+ and π^- data for the same momentum and target, it can be seen that there is very little difference between the charged-particle currents produced by these particles. Caution should be exercised when using the data in the tables for large depths and/or large radial intervals. The statistics for these data are rather poor so the user may wish to average some of the data over a larger spatial interval.

TABLE 1

CHARGED PARTICLE CURRENT AT VARIOUS SPATIAL
LOCATIONS IN AN ALUMINUM TARGET DUE TO INCIDENT
0.5GEV/C PI+

NUMBER/INCIDENT PARTICLE

DEPTH (CM)	RADIAL INTERVAL (CM) 0-1	1-2	2-4	4-6	6-10	10-15	15-30	30-INFINITY
10.	0.313E 00	0.319E-01	0.462E-01	0.314E-01	0.333E-01	0.232E-01	0.242E-01	0.113E-01
20.	0.493E 00	0.144E 00	0.459E-01	0.394E-01	0.571E-01	0.424E-01	0.467E-01	0.143E-01
30.	0.169E 00	0.222E 00	0.110E 00	0.285E-01	0.522E-01	0.456E-01	0.649E-01	0.230E-01
40.	0.541E-01	0.110E 00	0.155E 00	0.387E-01	0.376E-01	0.367E-01	0.596E-01	0.285E-01
50.	0.177E-01	0.432E-01	0.997E-01	0.569E-01	0.324E-01	0.212E-01	0.475E-01	0.267E-01
60.	0.544E-02	0.180E-01	0.476E-01	0.440E-01	0.369E-01	0.151E-01	0.263E-01	0.233E-01
70.	0.231E-02	0.612E-02	0.208E-01	0.241E-01	0.316E-01	0.102E-01	0.154E-01	0.151E-01
80.	0.125E-03	0.187E-03	0.312E-03	0.812E-03	0.181E-02	0.219E-02	0.762E-02	0.137E-01

TABLE 2

CHARGED PARTICLE CURRENT AT VARIOUS SPATIAL
LOCATIONS IN AN ALUMINUM TARGET DUE TO INCIDENT
0.5GEV/C PI-

NUMBER/INCIDENT PARTICLE

DEPTH (CM)	RADIAL INTERVAL (CM) 0-1	1-2	2-4	4-6	6-10	10-15	15-30	30-INFINITY
10.	0.805E 00	0.220E-01	0.354E-01	0.251E-01	0.324E-01	0.199E-01	0.232E-01	0.124E-01
20.	0.484E 00	0.138E 00	0.399E-01	0.297E-01	0.459E-01	0.396E-01	0.476E-01	0.126E-01
30.	0.161E 00	0.214E 00	0.100E 00	0.252E-01	0.434E-01	0.412E-01	0.588E-01	0.205E-01
40.	0.497E-01	0.106E 00	0.144E 00	0.351E-01	0.361E-01	0.309E-01	0.627E-01	0.266E-01
50.	0.150E-01	0.436E-01	0.963E-01	0.538E-01	0.328E-01	0.259E-01	0.418E-01	0.252E-01
60.	0.562E-02	0.166E-01	0.497E-01	0.416E-01	0.389E-01	0.157E-01	0.291E-01	0.224E-01
70.	0.219E-02	0.794E-02	0.219E-01	0.241E-01	0.327E-01	0.132E-01	0.133E-01	0.174E-01
80.	0.0	0.187E-03	0.687E-03	0.812E-03	0.231E-02	0.356E-02	0.819E-02	0.126E-01

TABLE 3

CHARGED PARTICLE CURRENT AT VARIOUS SPATIAL LOCATIONS IN AN ALUMINUM TARGET DUE TO INCIDENT 1.0GEV/C PI+

NUMBER/INCIDENT PARTICLE

DEPTH (CM)	RADIAL INTERVAL (CM) 0-1	1-2	2-4	4-6	6-10	10-15	15-30	30-INFINITY
10.	0.821E 00	0.579E-01	0.845E-01	0.502E-01	0.629E-01	0.456E-01	0.494E-01	0.259E-01
20.	0.626E 00	0.561E-01	0.962E-01	0.747E-01	0.112E 00	0.307E-01	0.102E 00	0.419E-01
30.	0.417E 00	0.101E 00	0.781E-01	0.725E-01	0.121E 00	0.106E 00	0.129E 00	0.581E-01
40.	0.219E 00	0.165E 00	0.740E-01	0.555E-01	0.103E 00	0.975E-01	0.151E 00	0.682E-01
50.	0.104E 00	0.148E 00	0.102E 00	0.472E-01	0.852E-01	0.835E-01	0.138E 00	0.722E-01
60.	0.534E-01	0.974E-01	0.109E 00	0.385E-01	0.589E-01	0.704E-01	0.127E 00	0.809E-01
70.	0.280E-01	0.592E-01	0.945E-01	0.464E-01	0.520E-01	0.589E-01	0.110E 00	0.789E-01
80.	0.135E-01	0.335E-01	0.777E-01	0.421E-01	0.397E-01	0.410E-01	0.946E-01	0.675E-01
90.	0.825E-02	0.211E-01	0.529E-01	0.377E-01	0.387E-01	0.330E-01	0.669E-01	0.637E-01
100.	0.475E-02	0.147E-01	0.359E-01	0.321E-01	0.302E-01	0.282E-01	0.515E-01	0.531E-01
110.	0.262E-02	0.900E-02	0.224E-01	0.261E-01	0.301E-01	0.187E-01	0.437E-01	0.487E-01
120.	0.200E-02	0.387E-02	0.161E-01	0.195E-01	0.262E-01	0.191E-01	0.344E-01	0.311E-01
130.	0.187E-02	0.237E-02	0.104E-01	0.116E-01	0.199E-01	0.149E-01	0.235E-01	0.271E-01
140.	0.100E-02	0.150E-02	0.512E-02	0.850E-02	0.137E-01	0.109E-01	0.162E-01	0.159E-01
150.	0.625E-03	0.875E-03	0.387E-02	0.512E-02	0.887E-02	0.700E-02	0.124E-01	0.116E-01

TABLE 4

CHARGED PARTICLE CURRENT AT VARIOUS SPATIAL LOCATIONS IN AN ALUMINUM TARGET DUE TO INCIDENT 1.0GEV/C PI-

NUMBER/INCIDENT PARTICLE

DEPTH (CM)	RADIAL INTERVAL (CM) 0-1	1-2	2-4	4-6	6-10	10-15	15-30	30-INFINITY
10.	0.820E 00	0.494E-01	0.760E-01	0.504E-01	0.584E-01	0.402E-01	0.571E-01	0.219E-01
20.	0.618E 00	0.471E-01	0.870E-01	0.716E-01	0.109E 00	0.799E-01	0.879E-01	0.384E-01
30.	0.419E 00	0.897E-01	0.725E-01	0.720E-01	0.110E 00	0.101E 00	0.132E 00	0.535E-01
40.	0.217E 00	0.166E 00	0.609E-01	0.544E-01	0.960E-01	0.102E 00	0.152E 00	0.671E-01
50.	0.108E 00	0.146E 00	0.907E-01	0.455E-01	0.911E-01	0.849E-01	0.140E 00	0.857E-01
60.	0.500E-01	0.982E-01	0.111E 00	0.416E-01	0.721E-01	0.771E-01	0.128E 00	0.832E-01
70.	0.269E-01	0.564E-01	0.103E 00	0.380E-01	0.479E-01	0.602E-01	0.111E 00	0.825E-01
80.	0.129E-01	0.316E-01	0.760E-01	0.412E-01	0.405E-01	0.439E-01	0.960E-01	0.709E-01
90.	0.637E-02	0.215E-01	0.491E-01	0.470E-01	0.341E-01	0.286E-01	0.720E-01	0.725E-01
100.	0.475E-02	0.130E-01	0.362E-01	0.300E-01	0.364E-01	0.202E-01	0.629E-01	0.504E-01
110.	0.225E-02	0.687E-02	0.227E-01	0.212E-01	0.327E-01	0.200E-01	0.432E-01	0.442E-01
120.	0.200E-02	0.500E-02	0.145E-01	0.172E-01	0.256E-01	0.174E-01	0.314E-01	0.350E-01
130.	0.750E-03	0.325E-02	0.100E-01	0.110E-01	0.190E-01	0.161E-01	0.244E-01	0.262E-01
140.	0.250E-03	0.187E-02	0.662E-02	0.787E-02	0.132E-01	0.116E-01	0.159E-01	0.210E-01
150.	0.125E-03	0.100E-02	0.325E-02	0.400E-02	0.825E-02	0.107E-01	0.962E-02	0.171E-01

TABLE 5

CHARGED PARTICLE CURRENT AT VARIOUS SPATIAL
LOCATIONS IN AN ALUMINUM TARGET DUE TO INCIDENT
2.0GEV/C PI+

NUMBER/INCIDENT PARTICLE

DEPTH (CM)	RADIAL INTERVAL (CM) 0-1	1-2	2-4	4-6	6-10	10-15	15-30	30-INFINITY
10.	0.901E 00	0.822E-01	0.110E 00	0.695E-01	0.335E-01	0.672E-01	0.705E-01	0.487E-01
20.	0.697E 00	0.942E-01	0.161E 00	0.140E 00	0.165E 00	0.131E 00	0.175E 00	0.857E-01
30.	0.539E 00	0.812E-01	0.164E 00	0.167E 00	0.230E 00	0.203E 00	0.276E 00	0.137E 00
40.	0.410E 00	0.805E-01	0.143E 00	0.143E 00	0.200E 00	0.229E 00	0.340E 00	0.196E 00
50.	0.270E 00	0.107E 00	0.125E 00	0.124E 00	0.233E 00	0.207E 00	0.373E 00	0.224E 00
60.	0.165E 00	0.126E 00	0.115E 00	0.113E 00	0.215E 00	0.203E 00	0.371E 00	0.210E 00
70.	0.930E-01	0.121E 00	0.982E-01	0.945E-01	0.160E 00	0.189E 00	0.351E 00	0.245E 00
80.	0.550E-01	0.837E-01	0.902E-01	0.660E-01	0.123E 00	0.154E 00	0.305E 00	0.242E 00
90.	0.347E-01	0.590E-01	0.755E-01	0.595E-01	0.102E 00	0.118E 00	0.252E 00	0.216E 00
100.	0.197E-01	0.407E-01	0.717E-01	0.380E-01	0.902E-01	0.837E-01	0.187E 00	0.187E 00
110.	0.975E-02	0.295E-01	0.545E-01	0.385E-01	0.667E-01	0.935E-01	0.160E 00	0.162E 00
120.	0.850E-02	0.160E-01	0.380E-01	0.287E-01	0.535E-01	0.507E-01	0.145E 00	0.139E 00
130.	0.525E-02	0.120E-01	0.305E-01	0.285E-01	0.342E-01	0.460E-01	0.117E 00	0.120E 00
140.	0.400E-02	0.850E-02	0.195E-01	0.200E-01	0.252E-01	0.385E-01	0.767E-01	0.925E-01
150.	0.250E-02	0.700E-02	0.130E-01	0.180E-01	0.187E-01	0.255E-01	0.605E-01	0.780E-01
160.	0.200E-02	0.575E-02	0.117E-01	0.975E-02	0.190E-01	0.200E-01	0.410E-01	0.645E-01
170.	0.175E-02	0.300E-02	0.850E-02	0.650E-02	0.117E-01	0.152E-01	0.347E-01	0.562E-01
180.	0.100E-02	0.150E-02	0.700E-02	0.575E-02	0.102E-01	0.112E-01	0.200E-01	0.410E-01
190.	0.500E-03	0.175E-02	0.400E-02	0.450E-02	0.775E-02	0.475E-02	0.187E-01	0.285E-01
200.	0.500E-03	0.125E-02	0.450E-02	0.450E-02	0.525E-02	0.325E-02	0.102E-01	0.212E-01
210.	0.500E-03	0.125E-02	0.250E-02	0.425E-02	0.575E-02	0.300E-02	0.675E-02	0.137E-01
220.	0.500E-03	0.125E-02	0.225E-02	0.225E-02	0.375E-02	0.275E-02	0.675E-02	0.107E-01
230.	0.250E-03	0.125E-02	0.225E-02	0.325E-02	0.125E-02	0.425E-02	0.475E-02	0.650E-02

TABLE 6

CHARGED PARTICLE CURRENT AT VARIOUS SPATIAL LOCATIONS IN AN ALUMINUM TARGET DUE TO INCIDENT 3.0GEV/C PI+

NUMBER/INCIDENT PARTICLE

DEPTH (CM)	RADIAL INTERVAL (CM) 0-1	1-2	2-4	4-6	6-10	10-15	15-30	30-INFINITY
10.	0.937E 00	0.123E 00	0.165E 00	0.109E 00	0.120E 00	0.662E-01	0.824E-01	0.537E-01
20.	0.754E 00	0.138E 00	0.267E 00	0.192E 00	0.270E 00	0.174E 00	0.215E 00	0.893E-01
30.	0.580E 00	0.146E 00	0.267E 00	0.274E 00	0.328E 00	0.330E 00	0.397E 00	0.152E 00
40.	0.469E 00	0.102E 00	0.242E 00	0.226E 00	0.421E 00	0.370E 00	0.529E 00	0.233E 00
50.	0.345E 00	0.105E 00	0.231E 00	0.223E 00	0.413E 00	0.369E 00	0.592E 00	0.305E 00
60.	0.266E 00	0.964E-01	0.174E 00	0.174E 00	0.346E 00	0.368E 00	0.631E 00	0.409E 00
70.	0.174E 00	0.111E 00	0.160E 00	0.176E 00	0.287E 00	0.325E 00	0.596E 00	0.386E 00
80.	0.120E 00	0.877E-01	0.102E 00	0.162E 00	0.249E 00	0.306E 00	0.529E 00	0.397E 00
90.	0.709E-01	0.889E-01	0.100E 00	0.108E 00	0.227E 00	0.198E 00	0.477E 00	0.404E 00
100.	0.481E-01	0.708E-01	0.668E-01	0.105E 00	0.178E 00	0.208E 00	0.398E 00	0.373E 00
110.	0.280E-01	0.581E-01	0.704E-01	0.593E-01	0.154E 00	0.156E 00	0.342E 00	0.342E 00
120.	0.212E-01	0.348E-01	0.653E-01	0.521E-01	0.122E 00	0.143E 00	0.253E 00	0.286E 00
130.	0.128E-01	0.236E-01	0.496E-01	0.336E-01	0.104E 00	0.123E 00	0.244E 00	0.237E 00
140.	0.800E-02	0.220E-01	0.380E-01	0.244E-01	0.765E-01	0.107E 00	0.188E 00	0.228E 00
150.	0.480E-02	0.144E-01	0.304E-01	0.300E-01	0.528E-01	0.815E-01	0.169E 00	0.176E 00
160.	0.360E-02	0.104E-01	0.240E-01	0.148E-01	0.296E-01	0.601E-01	0.168E 00	0.144E 00
170.	0.200E-02	0.801E-02	0.144E-01	0.188E-01	0.268E-01	0.309E-01	0.117E 00	0.131E 00
180.	0.280E-02	0.520E-02	0.132E-01	0.192E-01	0.188E-01	0.288E-01	0.857E-01	0.999E-01
190.	0.120E-02	0.320E-02	0.760E-02	0.720E-02	0.136E-01	0.216E-01	0.533E-01	0.886E-01
200.	0.120E-02	0.280E-02	0.520E-02	0.520E-02	0.148E-01	0.144E-01	0.477E-01	0.633E-01
210.	0.0	0.120E-02	0.600E-02	0.681E-02	0.172E-01	0.128E-01	0.420E-01	0.502E-01
220.	0.0	0.120E-02	0.280E-02	0.561E-02	0.232E-01	0.128E-01	0.276E-01	0.393E-01
230.	0.0	0.120E-02	0.240E-02	0.361E-02	0.196E-01	0.720E-02	0.232E-01	0.395E-01
240.	0.0	0.0	0.160E-02	0.200E-02	0.960E-02	0.800E-02	0.188E-01	0.331E-01

TABLE 7

CHARGED PARTICLE CURRENT AT VARIOUS SPATIAL LOCATIONS IN AN IRON TARGET DUE TO INCIDENT 0.5 GEV/C PI+

NUMBER/INCIDENT PARTICLE

DEPTH (CM)	RADIAL INTERVAL (CM) 0-1	1-2	2-4	4-6	6-10	10-15	15-30
5.	0.810E 00	0.491E-01	0.545E-01	0.237E-01	0.178E-01	0.581E-02	0.112E-02
10.	0.513E 00	0.913E-01	0.577E-01	0.329E-01	0.319E-01	0.888E-02	0.212E-02
15.	0.138E 00	0.183E 00	0.695E-01	0.282E-01	0.311E-01	0.113E-01	0.287E-02
20.	0.560E-01	0.108E 00	0.104E 00	0.233E-01	0.198E-01	0.719E-02	0.281E-02
25.	0.178E-01	0.408E-01	0.774E-01	0.289E-01	0.101E-01	0.350E-02	0.119E-02

TABLE 8

CHARGED PARTICLE CURRENT AT VARIOUS SPATIAL LOCATIONS IN AN IRON TARGET DUE TO INCIDENT 0.5 GEV/C PI-

NUMBER/INCIDENT PARTICLE

DEPTH (CM)	RADIAL INTERVAL (CM) 0-1	1-2	2-4	4-6	6-10	10-15	15-30
5.	0.793E 00	0.423E-01	0.491E-01	0.213E-01	0.151E-01	0.563E-02	0.194E-02
10.	0.505E 00	0.876E-01	0.612E-01	0.334E-01	0.308E-01	0.882E-02	0.251E-02
15.	0.178E 00	0.180E 00	0.654E-01	0.237E-01	0.346E-01	0.108E-01	0.307E-02
20.	0.523E-01	0.105E 00	0.105E 00	0.188E-01	0.185E-01	0.675E-02	0.188E-02
25.	0.167E-01	0.416E-01	0.780E-01	0.297E-01	0.938E-02	0.382E-02	0.156E-02

TABLE 9

CHARGED PARTICLE CURRENT AT VARIOUS SPATIAL LOCATIONS IN AN IRON TARGET DUE TO INCIDENT 1 GEV/C PI+

NUMBER/INCIDENT PARTICLE

DEPTH (CM)	RADIAL INTERVAL (CM) 0-1	1-2	2-4	4-6	6-10	10-15	15-30	30-INFINITY
5.	0.874E 00	0.102E 00	0.103E 00	0.484E-01	0.411E-01	0.125E-01	0.437E-02	0.375E-03
10.	0.639E 00	0.108E 00	0.142E 00	0.664E-01	0.676E-01	0.230E-01	0.150E-01	0.250E-03
15.	0.449E 00	0.966E-01	0.119E 00	0.767E-01	0.635E-01	0.289E-01	0.100E-01	0.500E-03
20.	0.256E 00	0.134E 00	0.819E-01	0.640E-01	0.625E-01	0.284E-01	0.119E-01	0.625E-03
25.	0.131E 00	0.134E 00	0.774E-01	0.497E-01	0.544E-01	0.231E-01	0.129E-01	0.500E-03
30.	0.655E-01	0.981E-01	0.804E-01	0.285E-01	0.425E-01	0.239E-01	0.130E-01	0.125E-03
35.	0.307E-01	0.632E-01	0.774E-01	0.292E-01	0.304E-01	0.195E-01	0.100E-01	0.500E-03
40.	0.172E-01	0.385E-01	0.657E-01	0.315E-01	0.232E-01	0.144E-01	0.116E-01	0.250E-03
45.	0.825E-02	0.195E-01	0.496E-01	0.276E-01	0.189E-01	0.114E-01	0.937E-02	0.500E-03
50.	0.412E-02	0.100E-01	0.284E-01	0.182E-01	0.146E-01	0.227E-01	0.750E-02	0.375E-03
55.	0.162E-02	0.550E-02	0.170E-01	0.126E-01	0.129E-01	0.462E-02	0.487E-02	0.0
60.	0.625E-03	0.362E-02	0.750E-02	0.937E-02	0.950E-02	0.350E-02	0.112E-02	0.250E-03
65.	0.500E-03	0.875E-03	0.525E-03	0.437E-01	0.562E-02	0.162E-02	0.750E-03	0.375E-03
70.	0.0	0.125E-03	0.0	0.125E-03	0.500E-03	0.125E-03	0.100E-02	0.250E-03

TABLE 10

CHARGED PARTICLE CURRENT AT VARIOUS SPATIAL LOCATIONS IN AN IRON TARGET DUE TO INCIDENT 1 GEV/C PI-

NUMBER/INCIDENT PARTICLE

DEPTH (CM)	RADIAL INTERVAL (CM) 0-1	1-2	2-4	4-6	6-10	10-15	15-30	30-INFINITY
5.	0.848E 00	0.915E-01	0.108E 00	0.431E-01	0.356E-01	0.104E-01	0.650E-02	0.500E-03
10.	0.636E 00	0.890E-01	0.122E 00	0.706E-01	0.649E-01	0.184E-01	0.750E-02	0.500E-03
15.	0.440E 00	0.981E-01	0.111E 00	0.702E-01	0.637E-01	0.290E-01	0.987E-02	0.500E-03
20.	0.253E 00	0.133E 00	0.915E-01	0.542E-01	0.561E-01	0.301E-01	0.141E-01	0.375E-03
25.	0.124E 00	0.136E 00	0.774E-01	0.430E-01	0.502E-01	0.231E-01	0.117E-01	0.750E-03
30.	0.634E-01	0.100E 00	0.826E-01	0.359E-01	0.395E-01	0.224E-01	0.130E-01	0.625E-03
35.	0.342E-01	0.606E-01	0.847E-01	0.305E-01	0.325E-01	0.171E-01	0.150E-01	0.625E-03
40.	0.179E-01	0.370E-01	0.634E-01	0.290E-01	0.290E-01	0.147E-01	0.115E-01	0.100E-02
45.	0.825E-02	0.179E-01	0.476E-01	0.270E-01	0.212E-01	0.109E-01	0.800E-02	0.250E-03
50.	0.475E-02	0.987E-02	0.282E-01	0.224E-01	0.156E-01	0.122E-01	0.575E-02	0.250E-03
55.	0.262E-02	0.525E-02	0.149E-01	0.144E-01	0.135E-01	0.550E-02	0.387E-02	0.375E-03
60.	0.100E-03	0.212E-02	0.800E-02	0.712E-02	0.106E-01	0.450E-02	0.212E-02	0.500E-03
65.	0.500E-02	0.100E-02	0.350E-02	0.325E-02	0.575E-02	0.175E-02	0.500E-03	0.625E-03
70.	0.0	0.0	0.500E-03	0.375E-03	0.750E-03	0.625E-03	0.750E-03	0.875E-03
75.	0.0	0.0	0.0	0.0	0.125E-03	0.125E-03	0.500E-03	0.250E-03

TABLE 11

CHARGED PARTICLE CURRENT AT VARIOUS SPATIAL LOCATIONS IN AN IRON TARGET DUE TO INCIDENT 2 GEV/C PI+

NUMBER/INCIDENT PARTICLE

DEPTH (CM)	RADIAL INTERVAL (CM) 0-1	1-2	2-4	4-6	6-10	10-15	15-30	30-INFINITY
5.	0.968E 00	0.177E 00	0.191E 00	0.912E-01	0.552E-01	0.252E-01	0.132E-01	0.500E-03
10.	0.757E 00	0.225E 00	0.298E 00	0.157E 00	0.136E 00	0.507E-01	0.205E-01	0.125E-02
15.	0.572E 00	0.174E 00	0.307E 00	0.181E 00	0.168E 00	0.877E-01	0.367E-01	0.750E-03
20.	0.419E 00	0.134E 00	0.234E 00	0.155E 00	0.176E 00	0.877E-01	0.452E-01	0.175E-02
25.	0.295E 00	0.124E 00	0.181E 00	0.128E 00	0.153E 00	0.845E-01	0.590E-01	0.300E-02
30.	0.200E 00	0.114E 00	0.126E 00	0.962E-01	0.128E 00	0.597E-01	0.532E-01	0.400E-02
35.	0.126E 00	0.106E 00	0.112E 00	0.822E-01	0.987E-01	0.542E-01	0.415E-01	0.600E-02
40.	0.727E-01	0.787E-01	0.862E-01	0.660E-01	0.752E-01	0.495E-01	0.360E-01	0.375E-02
45.	0.402E-01	0.542E-01	0.670E-01	0.475E-01	0.557E-01	0.437E-01	0.280E-01	0.375E-02
50.	0.262E-01	0.345E-01	0.447E-01	0.265E-01	0.377E-01	0.302E-01	0.272E-01	0.550E-02
55.	0.195E-01	0.292E-01	0.415E-01	0.165E-01	0.337E-01	0.282E-01	0.212E-01	0.400E-02
60.	0.900E-02	0.182E-01	0.360E-01	0.162E-01	0.192E-01	0.177E-01	0.137E-01	0.225E-02
65.	0.675E-02	0.900E-02	0.240E-01	0.115E-01	0.175E-01	0.105E-01	0.875E-02	0.200E-02
70.	0.500E-02	0.825E-02	0.127E-01	0.102E-01	0.122E-01	0.725E-02	0.950E-02	0.250E-02
75.	0.425E-02	0.475E-02	0.132E-01	0.110E-01	0.900E-02	0.650E-02	0.600E-02	0.200E-02

TABLE 12

CHARGED PARTICLE CURRENT AT VARIOUS SPATIAL LOCATIONS IN AN IRON TARGET DUE TO INCIDENT 3 GEV/C PI+

NUMBER/INCIDENT PARTICLE

DEPTH (CM)	RADIAL INTERVAL (CM) 0-1	1-2	2-4	4-6	6-10	10-15	15-30	30-INFINITY
5.	0.113E 01	0.244E 00	0.273E 00	0.111E 00	0.706E-01	0.289E-01	0.146E-01	0.202E-02
10.	0.887E 00	0.365E 00	0.488E 00	0.288E 00	0.212E 00	0.633E-01	0.185E-01	0.799E-03
15.	0.721E 00	0.312E 00	0.506E 00	0.291E 00	0.302E 00	0.106E 00	0.449E-01	0.322E-02
20.	0.557E 00	0.288E 00	0.437E 00	0.281E 00	0.296E 00	0.123E 00	0.676E-01	0.242E-02
25.	0.392E 00	0.194E 00	0.383E 00	0.243E 00	0.253E 00	0.147E 00	0.675E-01	0.449E-02
30.	0.272E 00	0.166E 00	0.271E 00	0.193E 00	0.234E 00	0.115E 00	0.812E-01	0.105E-01
35.	0.195E 00	0.113E 00	0.220E 00	0.145E 00	0.178E 00	0.106E 00	0.685E-01	0.728E-02
40.	0.120E 00	0.985E-01	0.157E 00	0.107E 00	0.138E 00	0.100E 00	0.753E-01	0.101E-01
45.	0.904E-01	0.522E-01	0.958E-01	0.706E-01	0.115E 00	0.903E-01	0.623E-01	0.852E-02
50.	0.776E-01	0.656E-01	0.103E 00	0.754E-01	0.742E-01	0.795E-01	0.586E-01	0.105E-01
55.	0.400E-01	0.468E-01	0.605E-01	0.544E-01	0.642E-01	0.458E-01	0.433E-01	0.923E-02
60.	0.264E-01	0.368E-01	0.565E-01	0.617E-01	0.501E-01	0.337E-01	0.297E-01	0.763E-02
65.	0.156E-01	0.268E-01	0.397E-01	0.253E-01	0.420E-01	0.293E-01	0.301E-01	0.643E-02
70.	0.680E-02	0.176E-01	0.337E-01	0.132E-01	0.316E-01	0.221E-01	0.277E-01	0.726E-02
75.	0.560E-02	0.148E-01	0.237E-01	0.129E-01	0.244E-01	0.212E-01	0.217E-01	0.761E-02
80.	0.400E-02	0.600E-02	0.277E-01	0.880E-02	0.152E-01	0.104E-01	0.205E-01	0.240E-02
85.	0.200E-02	0.320E-02	0.206E-01	0.100E-01	0.840E-02	0.920E-02	0.721E-02	0.240E-02
90.	0.0	0.400E-02	0.133E-01	0.440E-02	0.104E-01	0.640E-02	0.117E-01	0.361E-02
95.	0.400E-02	0.366E-02	0.880E-02	0.520E-02	0.360E-02	0.480E-02	0.561E-02	0.280E-02
100.	0.0	0.166E-02	0.600E-02	0.280E-02	0.400E-02	0.440E-02	0.360E-02	0.239E-02

TABLE 13

CHARGED PARTICLE CURRENT AT VARIOUS SPATIAL LOCATIONS IN A LEAD TARGET DUE TO INCIDENT 0.5 GEV/C PI+

NUMBER/INCIDENT PARTICLE

DEPTH (CM)	RADIAL INTERVAL (CM) 0-1	1-2	2-4	4-6	6-10	10-15	15-30	30-INFINITY
2.	0.954E 00	0.297E-01	0.147E-01	0.337E-02	0.181E-02	0.187E-03	0.0	0.0
4.	0.863E 00	0.362E-01	0.270E-01	0.650E-02	0.352E-02	0.499E-03	0.620E-04	0.620E-04
6.	0.741E 00	0.614E-01	0.324E-01	0.981E-02	0.475E-02	0.812E-03	0.620E-04	0.0
8.	0.519E 00	0.194E 00	0.356E-01	0.148E-01	0.637E-02	0.156E-02	0.312E-03	0.0
10.	0.313E 00	0.274E 00	0.724E-01	0.127E-01	0.956E-02	0.275E-02	0.250E-03	0.620E-04
12.	0.178E 00	0.256E 00	0.146E 00	0.160E-01	0.994E-02	0.281E-02	0.562E-03	0.0
14.	0.102E 00	0.192E 00	0.195E 00	0.276E-01	0.110E-01	0.269E-02	0.187E-03	0.0
16.	0.592E-01	0.131E 00	0.199E 00	0.538E-01	0.148E-01	0.269E-02	0.0	0.620E-04
18.	0.357E-01	0.850E-01	0.170E 00	0.728E-01	0.256E-01	0.219E-02	0.312E-03	0.620E-04
20.	0.201E-01	0.526E-01	0.131E 00	0.782E-01	0.374E-01	0.319E-02	0.187E-03	0.620E-04
22.	0.130E-01	0.322E-01	0.943E-01	0.706E-01	0.454E-01	0.231E-02	0.620E-04	0.620E-04
24.	0.762E-02	0.189E-01	0.600E-01	0.477E-01	0.293E-01	0.124E-03	0.187E-03	0.620E-04
26.	0.687E-03	0.231E-02	0.394E-02	0.187E-02	0.750E-03	0.0	0.0	0.620E-04
28.	0.620E-04	0.620E-04	0.124E-03	0.0	0.620E-04	0.620E-04	0.620E-04	0.620E-04

TABLE 14

CHARGED PARTICLE CURRENT AT VARIOUS SPATIAL LOCATIONS IN A LEAD TARGET DUE TO INCIDENT 0.5 GEV/C PI-

NUMBER/INCIDENT PARTICLE

DEPTH (CM)	RADIAL INTERVAL (CM) 0-1	1-2	2-4	4-6	6-10	10-15	15-30	30-INFINITY
2.	0.945E 00	0.186E-01	0.112E-01	0.344E-02	0.112E-02	0.312E-03	0.187E-03	0.620E-04
4.	0.851E 00	0.319E-01	0.228E-01	0.675E-02	0.219E-02	0.937E-03	0.620E-04	0.0
6.	0.734E 00	0.549E-01	0.277E-01	0.875E-02	0.550E-02	0.937E-03	0.187E-03	0.187E-03
8.	0.508E 00	0.182E 00	0.328E-01	0.136E-01	0.781E-02	0.187E-02	0.250E-03	0.187E-03
10.	0.301E 00	0.267E 00	0.642E-01	0.128E-01	0.101E-01	0.137E-02	0.312E-03	0.620E-04
12.	0.174E 00	0.241E 00	0.129E 00	0.127E-01	0.101E-01	0.275E-02	0.374E-03	0.125E-03
14.	0.100E 00	0.184E 00	0.177E 00	0.261E-01	0.110E-01	0.269E-02	0.250E-03	0.0
16.	0.578E-01	0.130E 00	0.185E 00	0.454E-01	0.147E-01	0.325E-02	0.250E-03	0.250E-03
18.	0.339E-01	0.848E-01	0.160E 00	0.641E-01	0.256E-01	0.287E-02	0.312E-03	0.187E-03
20.	0.212E-01	0.524E-01	0.124E 00	0.722E-01	0.337E-01	0.344E-02	0.312E-03	0.125E-03
22.	0.131E-01	0.349E-01	0.901E-01	0.702E-01	0.427E-01	0.131E-02	0.312E-03	0.620E-04
24.	0.731E-02	0.207E-01	0.605E-01	0.472E-01	0.207E-01	0.562E-03	0.187E-03	0.125E-03
26.	0.119E-02	0.300E-02	0.431E-02	0.144E-02	0.312E-03	0.187E-03	0.187E-03	0.125E-03
28.	0.620E-04	0.620E-04	0.125E-03	0.187E-03	0.124E-03	0.249E-03	0.620E-04	0.0

TABLE 15

CHARGED PARTICLE CURRENT AT VARIOUS SPATIAL LOCATIONS IN A LEAD TARGET DUE TO INCIDENT 1.0 GEV/C PI+

NUMBER/INCIDENT PARTICLE

DEPTH (CM)	RADIAL INTERVAL (CM) 0-1	1-2	2-4	4-6	6-10	10-15	15-30	30-INFINITY
2.	0.100E 01	0.432E-01	0.306E-01	0.525E-02	0.537E-02	0.150E-02	0.500E-03	0.0
4.	0.916E 00	0.744E-01	0.511E-01	0.125E-01	0.800E-02	0.362E-02	0.750E-03	0.125E-03
6.	0.817E 00	0.650E-01	0.636E-01	0.216E-01	0.800E-02	0.262E-02	0.150E-02	0.125E-03
8.	0.734E 00	0.622E-01	0.655E-01	0.202E-01	0.141E-01	0.475E-02	0.500E-03	0.250E-03
10.	0.621E 00	0.917E-01	0.671E-01	0.254E-01	0.151E-01	0.412E-02	0.237E-02	0.0
12.	0.490E 00	0.145E 00	0.556E-01	0.254E-01	0.191E-01	0.462E-02	0.187E-02	0.125E-03
14.	0.362E 00	0.204E 00	0.625E-01	0.216E-01	0.190E-01	0.675E-02	0.262E-02	0.125E-03
16.	0.249E 00	0.224E 00	0.722E-01	0.255E-01	0.175E-01	0.875E-02	0.350E-02	0.125E-03
18.	0.182E 00	0.216E 00	0.947E-01	0.190E-01	0.187E-01	0.725E-02	0.300E-02	0.0
20.	0.120E 00	0.188E 00	0.126E 00	0.251E-01	0.189E-01	0.475E-02	0.487E-02	0.0
22.	0.869E-01	0.153E 00	0.139E 00	0.254E-01	0.210E-01	0.800E-02	0.337E-02	0.0
24.	0.610E-01	0.123E 00	0.145E 00	0.286E-01	0.189E-01	0.101E-01	0.287E-02	0.250E-03
26.	0.445E-01	0.955E-01	0.139E 00	0.367E-01	0.174E-01	0.100E-01	0.437E-02	0.0
28.	0.320E-01	0.771E-01	0.128E 00	0.464E-01	0.186E-01	0.900E-02	0.475E-02	0.125E-03
30.	0.227E-01	0.551E-01	0.118E 00	0.500E-01	0.236E-01	0.962E-02	0.487E-02	0.250E-03
32.	0.161E-01	0.417E-01	0.974E-01	0.549E-01	0.259E-01	0.925E-02	0.475E-02	0.375E-03
34.	0.105E-01	0.329E-01	0.791E-01	0.519E-01	0.325E-01	0.725E-02	0.537E-02	0.375E-03
36.	0.950E-02	0.244E-01	0.669E-01	0.517E-01	0.365E-01	0.975E-02	0.450E-02	0.125E-03
38.	0.725E-02	0.187E-01	0.489E-01	0.481E-01	0.351E-01	0.887E-02	0.450E-02	0.250E-03
40.	0.462E-02	0.169E-01	0.380E-01	0.409E-01	0.371E-01	0.900E-02	0.500E-02	0.125E-03
42.	0.387E-02	0.100E-01	0.316E-01	0.362E-01	0.400E-01	0.101E-01	0.500E-02	0.125E-03
44.	0.325E-02	0.912E-02	0.245E-01	0.277E-01	0.375E-01	0.114E-01	0.400E-02	0.125E-03
46.	0.287E-02	0.600E-02	0.196E-01	0.252E-01	0.337E-01	0.134E-01	0.350E-02	0.0
48.	0.162E-02	0.450E-02	0.144E-01	0.209E-01	0.294E-01	0.152E-01	0.300E-02	0.125E-03
50.	0.162E-02	0.362E-02	0.109E-01	0.149E-01	0.276E-01	0.140E-01	0.287E-02	0.0
52.	0.625E-03	0.300E-02	0.975E-02	0.115E-01	0.255E-01	0.120E-01	0.350E-02	0.0
54.	0.500E-03	0.175E-02	0.725E-02	0.837E-02	0.210E-01	0.127E-01	0.400E-02	0.125E-03
56.	0.625E-03	0.137E-02	0.500E-02	0.787E-02	0.162E-01	0.975E-02	0.375E-02	0.0
58.	0.375E-03	0.100E-02	0.300E-02	0.637E-02	0.112E-01	0.837E-02	0.212E-02	0.125E-03
60.	0.500E-03	0.250E-03	0.187E-02	0.237E-02	0.650E-02	0.300E-02	0.750E-03	0.0
62.	0.250E-03	0.250E-03	0.375E-03	0.375E-03	0.112E-02	0.137E-02	0.250E-03	0.250E-03

TABLE 16

CHARGED PARTICLE CURRENT AT VARIOUS SPATIAL LOCATIONS IN A LEAD TARGET DUE TO INCIDENT 1.0 GEV/C PI-

NUMBER/INCIDENT PARTICLE

DEPTH (CM)	RADIAL INTERVAL (CM) 0-1	1-2	2-4	4-6	6-10	10-15	15-30	30-INFINITY
2.	0.100E 01	0.420E-01	0.261E-01	0.737E-02	0.512E-02	0.162E-02	0.375E-03	0.125E-03
4.	0.913E 00	0.685E-01	0.445E-01	0.112E-01	0.550E-02	0.175E-02	0.875E-03	0.0
6.	0.830E 00	0.691E-01	0.497E-01	0.185E-01	0.850E-02	0.212E-02	0.162E-02	0.125E-03
8.	0.738E 00	0.600E-01	0.601E-01	0.227E-01	0.116E-01	0.337E-02	0.875E-03	0.0
10.	0.624E 00	0.880E-01	0.580E-01	0.234E-01	0.175E-01	0.412E-02	0.162E-02	0.125E-03
12.	0.501E 00	0.137E 00	0.611E-01	0.237E-01	0.169E-01	0.650E-02	0.250E-02	0.125E-03
14.	0.373E 00	0.191E 00	0.622E-01	0.232E-01	0.201E-01	0.687E-02	0.300E-02	0.125E-03
16.	0.263E 00	0.218E 00	0.757E-01	0.221E-01	0.222E-01	0.812E-02	0.325E-02	0.125E-03
18.	0.186E 00	0.214E 00	0.974E-01	0.224E-01	0.212E-01	0.750E-02	0.437E-02	0.250E-03
20.	0.129E 00	0.181E 00	0.129E 00	0.230E-01	0.212E-01	0.106E-01	0.375E-02	0.375E-03
22.	0.934E-01	0.154E 00	0.142E 00	0.255E-01	0.206E-01	0.825E-02	0.362E-02	0.250E-03
24.	0.640E-01	0.123E 00	0.143E 00	0.345E-01	0.207E-01	0.100E-01	0.350E-02	0.250E-03
26.	0.509E-01	0.945E-01	0.136E 00	0.406E-01	0.189E-01	0.105E-01	0.462E-02	0.500E-03
28.	0.372E-01	0.746E-01	0.125E 00	0.456E-01	0.202E-01	0.104E-01	0.575E-02	0.125E-03
30.	0.259E-01	0.592E-01	0.111E 00	0.499E-01	0.247E-01	0.975E-02	0.537E-02	0.500E-03
32.	0.195E-01	0.459E-01	0.965E-01	0.547E-01	0.284E-01	0.106E-01	0.500E-02	0.250E-03
34.	0.150E-01	0.350E-01	0.772E-01	0.525E-01	0.299E-01	0.116E-01	0.737E-02	0.125E-03
36.	0.117E-01	0.235E-01	0.664E-01	0.500E-01	0.331E-01	0.120E-01	0.712E-02	0.0
38.	0.937E-02	0.189E-01	0.530E-01	0.492E-01	0.346E-01	0.130E-01	0.650E-02	0.250E-03
40.	0.800E-02	0.164E-01	0.407E-01	0.422E-01	0.354E-01	0.117E-01	0.662E-02	0.500E-03
42.	0.525E-02	0.119E-01	0.351E-01	0.355E-01	0.402E-01	0.115E-01	0.762E-02	0.500E-03
44.	0.412E-02	0.887E-02	0.269E-01	0.297E-01	0.377E-01	0.116E-01	0.762E-02	0.375E-03
46.	0.362E-02	0.687E-02	0.216E-01	0.246E-01	0.357E-01	0.130E-01	0.625E-02	0.875E-03
48.	0.300E-02	0.512E-02	0.184E-01	0.202E-01	0.320E-01	0.136E-01	0.600E-02	0.125E-03
50.	0.187E-02	0.387E-02	0.137E-01	0.152E-01	0.275E-01	0.134E-01	0.550E-02	0.250E-03
52.	0.125E-02	0.300E-02	0.101E-01	0.136E-01	0.234E-01	0.136E-01	0.550E-02	0.125E-03
54.	0.875E-03	0.362E-02	0.887E-02	0.101E-01	0.189E-01	0.127E-01	0.462E-02	0.125E-03
56.	0.625E-03	0.212E-02	0.537E-02	0.737E-02	0.141E-01	0.101E-01	0.400E-02	0.125E-03
58.	0.625E-03	0.375E-03	0.412E-02	0.612E-02	0.862E-02	0.712E-02	0.212E-02	0.375E-03
60.	0.0	0.500E-03	0.212E-02	0.350E-02	0.487E-02	0.225E-02	0.750E-03	0.0
62.	0.125E-03	0.0	0.125E-03	0.875E-03	0.137E-02	0.625E-03	0.250E-03	0.125E-03

TABLE 17

CHARGED PARTICLE CURRENT AT VARIOUS SPATIAL LOCATIONS IN A LEAD TARGET DUE TO INCIDENT 2.0 GEV/C PI+

NUMBER/INCIDENT PARTICLE

DEPTH (CM)	RADIAL INTERVAL (CM) 0-1	1-2	2-4	4-6	6-10	10-15	15-30	30-INFINITY
2.	0.109E 01	0.910E-01	0.500E-01	0.125E-01	0.900E-02	0.450E-02	0.250E-02	0.250E-03
4.	0.107E 01	0.128E 00	0.865E-01	0.252E-01	0.142E-01	0.575E-02	0.350E-02	0.0
6.	0.948E 00	0.171E 00	0.136E 00	0.427E-01	0.200E-01	0.675E-02	0.400E-02	0.500E-03
8.	0.868E 00	0.136E 00	0.135E 00	0.535E-01	0.302E-01	0.900E-02	0.575E-02	0.500E-03
10.	0.768E 00	0.145E 00	0.137E 00	0.527E-01	0.332E-01	0.112E-01	0.375E-02	0.500E-03
12.	0.679E 00	0.127E 00	0.129E 00	0.607E-01	0.400E-01	0.155E-01	0.650E-02	0.150E-02
14.	0.604E 00	0.108E 00	0.109E 00	0.580E-01	0.420E-01	0.177E-01	0.775E-02	0.750E-03
16.	0.509E 00	0.116E 00	0.118E 00	0.587E-01	0.540E-01	0.257E-01	0.130E-01	0.250E-03
18.	0.442E 00	0.139E 00	0.105E 00	0.595E-01	0.552E-01	0.237E-01	0.175E-01	0.125E-02
20.	0.355E 00	0.156E 00	0.990E-01	0.515E-01	0.495E-01	0.232E-01	0.127E-01	0.200E-02
22.	0.283E 00	0.172E 00	0.867E-01	0.522E-01	0.497E-01	0.262E-01	0.142E-01	0.200E-02
24.	0.215E 00	0.180E 00	0.965E-01	0.455E-01	0.447E-01	0.207E-01	0.167E-01	0.175E-02
26.	0.177E 00	0.176E 00	0.957E-01	0.440E-01	0.555E-01	0.225E-01	0.152E-01	0.150E-02
28.	0.133E 00	0.150E 00	0.112E 00	0.460E-01	0.502E-01	0.237E-01	0.177E-01	0.200E-02
30.	0.977E-01	0.139E 00	0.110E 00	0.377E-01	0.490E-01	0.215E-01	0.160E-01	0.275E-02
32.	0.727E-01	0.128E 00	0.107E 00	0.340E-01	0.390E-01	0.215E-01	0.200E-01	0.150E-02
34.	0.517E-01	0.105E 00	0.114E 00	0.322E-01	0.350E-01	0.235E-01	0.180E-01	0.200E-02
36.	0.407E-01	0.922E-01	0.103E 00	0.345E-01	0.337E-01	0.207E-01	0.185E-01	0.275E-02
38.	0.315E-01	0.717E-01	0.102E 00	0.322E-01	0.305E-01	0.202E-01	0.155E-01	0.175E-02
40.	0.280E-01	0.605E-01	0.104E 00	0.407E-01	0.325E-01	0.177E-01	0.170E-01	0.225E-02
42.	0.227E-01	0.455E-01	0.895E-01	0.400E-01	0.272E-01	0.180E-01	0.142E-01	0.200E-02
44.	0.205E-01	0.392E-01	0.737E-01	0.387E-01	0.230E-01	0.145E-01	0.142E-01	0.225E-02
46.	0.195E-01	0.302E-01	0.692E-01	0.320E-01	0.212E-01	0.130E-01	0.137E-01	0.150E-02
48.	0.127E-01	0.260E-01	0.582E-01	0.355E-01	0.195E-01	0.157E-01	0.115E-01	0.250E-02
50.	0.800E-02	0.200E-01	0.457E-01	0.385E-01	0.195E-01	0.135E-01	0.110E-01	0.175E-02
52.	0.500E-02	0.177E-01	0.437E-01	0.390E-01	0.227E-01	0.115E-01	0.105E-01	0.100E-02
54.	0.775E-02	0.117E-01	0.357E-01	0.332E-01	0.250E-01	0.925E-02	0.900E-02	0.150E-02
56.	0.400E-02	0.900E-02	0.300E-01	0.297E-01	0.262E-01	0.600E-02	0.105E-01	0.150E-02
58.	0.325E-02	0.900E-02	0.247E-01	0.280E-01	0.222E-01	0.625E-02	0.850E-02	0.200E-02
60.	0.200E-02	0.625E-02	0.247E-01	0.245E-01	0.180E-01	0.675E-02	0.725E-02	0.175E-02
62.	0.125E-02	0.700E-02	0.205E-01	0.215E-01	0.220E-01	0.550E-02	0.550E-02	0.200E-02
64.	0.200E-02	0.450E-02	0.172E-01	0.172E-01	0.187E-01	0.550E-02	0.575E-02	0.750E-03
66.	0.125E-02	0.275E-02	0.172E-01	0.167E-01	0.165E-01	0.400E-02	0.450E-02	0.125E-02
68.	0.125E-02	0.175E-02	0.120E-01	0.125E-01	0.145E-01	0.550E-02	0.400E-02	0.100E-02
70.	0.100E-02	0.275E-02	0.900E-02	0.100E-01	0.150E-01	0.475E-02	0.300E-02	0.125E-02
72.	0.750E-03	0.175E-02	0.850E-02	0.825E-02	0.137E-01	0.650E-02	0.325E-02	0.150E-02
74.	0.500E-03	0.125E-02	0.725E-02	0.825E-02	0.132E-01	0.625E-02	0.325E-02	0.125E-02
76.	0.500E-03	0.100E-02	0.600E-02	0.925E-02	0.137E-01	0.625E-02	0.300E-02	0.175E-02
78.	0.100E-02	0.500E-03	0.550E-02	0.750E-02	0.122E-01	0.550E-02	0.326E-02	0.125E-02

TABLE 18

CHARGED PARTICLE CURRENT AT VARIOUS SPATIAL LOCATIONS IN A LEAD TARGET DUE TO INCIDENT 3.0 GEV/C PI-

NUMBER/INCIDENT PARTICLE

DEPTH (CM)	RADIAL INTERVAL (CM) 0-1	1-2	2-4	4-6	6-10	10-15	15-30	30-INFINITY
2.	0.115E 01	0.111E 00	0.529E-01	0.116E-01	0.798E-02	0.209E-02	0.372E-02	0.0
4.	0.120E 01	0.164E 00	0.121E 00	0.318E-01	0.172E-01	0.374E-02	0.293E-02	0.0
6.	0.113E 01	0.226E 00	0.151E 00	0.457E-01	0.236E-01	0.752E-02	0.249E-02	0.0
8.	0.108E 01	0.236E 00	0.185E 00	0.657E-01	0.364E-01	0.130E-01	0.205E-02	0.0
10.	0.954E 00	0.267E 00	0.184E 00	0.764E-01	0.458E-01	0.148E-01	0.634E-02	0.403E-03
12.	0.863E 00	0.235E 00	0.201E 00	0.697E-01	0.598E-01	0.214E-01	0.842E-02	0.0
14.	0.754E 00	0.201E 00	0.231E 00	0.749E-01	0.627E-01	0.249E-01	0.101E-01	0.0
16.	0.683E 00	0.182E 00	0.190E 00	0.938E-01	0.682E-01	0.286E-01	0.166E-01	0.165E-02
18.	0.593E 00	0.158E 00	0.159E 00	0.862E-01	0.769E-01	0.371E-01	0.170E-01	0.165E-02
20.	0.530E 00	0.176E 00	0.143E 00	0.806E-01	0.744E-01	0.372E-01	0.199E-01	0.207E-02
22.	0.461E 00	0.182E 00	0.165E 00	0.706E-01	0.680E-01	0.352E-01	0.235E-01	0.168E-02
24.	0.343E 00	0.166E 00	0.140E 00	0.706E-01	0.748E-01	0.364E-01	0.214E-01	0.290E-02
26.	0.314E 00	0.158E 00	0.134E 00	0.557E-01	0.742E-01	0.283E-01	0.221E-01	0.247E-02
28.	0.246E 00	0.159E 00	0.120E 00	0.580E-01	0.615E-01	0.379E-01	0.258E-01	0.122E-02
30.	0.211E 00	0.141E 00	0.127E 00	0.687E-01	0.610E-01	0.370E-01	0.236E-01	0.245E-02
32.	0.197E 00	0.143E 00	0.112E 00	0.671E-01	0.577E-01	0.312E-01	0.155E-01	0.162E-02
34.	0.144E 00	0.132E 00	0.102E 00	0.535E-01	0.533E-01	0.316E-01	0.199E-01	0.287E-02
36.	0.118E 00	0.126E 00	0.889E-01	0.438E-01	0.618E-01	0.339E-01	0.191E-01	0.328E-02
38.	0.972E-01	0.125E 00	0.842E-01	0.397E-01	0.459E-01	0.375E-01	0.207E-01	0.501E-02
40.	0.864E-01	0.122E 00	0.957E-01	0.373E-01	0.481E-01	0.278E-01	0.258E-01	0.287E-02
42.	0.788E-01	0.113E 00	0.797E-01	0.385E-01	0.378E-01	0.275E-01	0.218E-01	0.284E-02
44.	0.572E-01	0.824E-01	0.816E-01	0.377E-01	0.358E-01	0.300E-01	0.222E-01	0.450E-02
46.	0.404E-01	0.728E-01	0.904E-01	0.253E-01	0.386E-01	0.253E-01	0.185E-01	0.492E-02
48.	0.320E-01	0.664E-01	0.901E-01	0.241E-01	0.334E-01	0.229E-01	0.245E-01	0.283E-02
50.	0.244E-01	0.496E-01	0.756E-01	0.241E-01	0.310E-01	0.245E-01	0.185E-01	0.324E-02
52.	0.208E-01	0.404E-01	0.600E-01	0.233E-01	0.230E-01	0.213E-01	0.193E-01	0.243E-02
54.	0.156E-01	0.284E-01	0.717E-01	0.197E-01	0.237E-01	0.213E-01	0.193E-01	0.286E-02
56.	0.176E-01	0.308E-01	0.620E-01	0.162E-01	0.190E-01	0.157E-01	0.177E-01	0.326E-02
58.	0.220E-01	0.272E-01	0.464E-01	0.188E-01	0.141E-01	0.144E-01	0.157E-01	0.446E-02
60.	0.132E-01	0.268E-01	0.396E-01	0.153E-01	0.171E-01	0.141E-01	0.177E-01	0.284E-02
62.	0.920E-02	0.256E-01	0.372E-01	0.152E-01	0.120E-01	0.157E-01	0.132E-01	0.326E-02
64.	0.100E-01	0.204E-01	0.268E-01	0.177E-01	0.720E-02	0.144E-01	0.116E-01	0.404E-02
66.	0.800E-02	0.140E-01	0.256E-01	0.212E-01	0.141E-01	0.112E-01	0.160E-01	0.362E-02
68.	0.440E-02	0.108E-01	0.296E-01	0.140E-01	0.105E-01	0.101E-01	0.100E-01	0.522E-02
70.	0.440E-02	0.720E-02	0.336E-01	0.164E-01	0.844E-02	0.683E-02	0.113E-01	0.441E-02
72.	0.320E-02	0.720E-02	0.292E-01	0.148E-01	0.113E-01	0.683E-02	0.108E-01	0.361E-02
74.	0.440E-02	0.360E-02	0.156E-01	0.108E-01	0.840E-02	0.562E-02	0.129E-01	0.240E-02
76.	0.280E-02	0.320E-02	0.144E-01	0.100E-01	0.767E-02	0.400E-02	0.964E-02	0.160E-02
78.	0.200E-02	0.240E-02	0.100E-01	0.920E-02	0.440E-02	0.560E-02	0.100E-01	0.240E-02

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