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INCLUSIVE PARTICLE PRODUCTION AT FORWARD ANGLES FROM COLLISIONS OF LIGHT RELATIVISTIC NUCLEI, PART III: DATA TABLES

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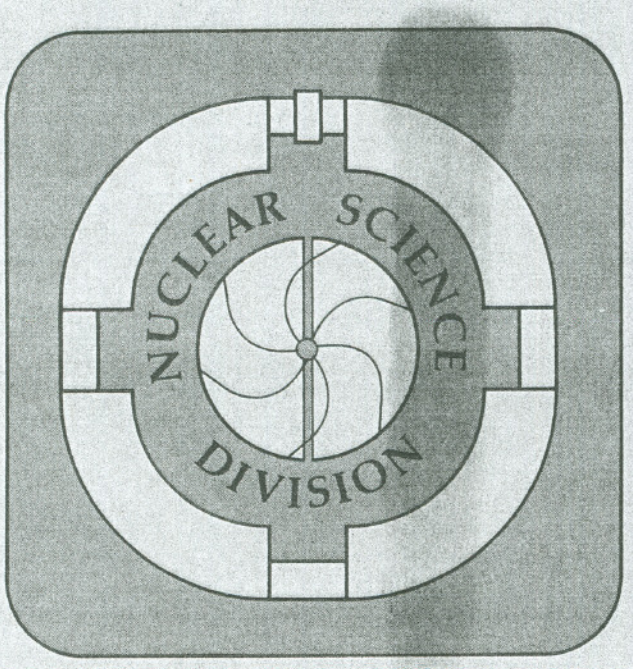
May 1982



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INCLUSIVE PARTICLE PRODUCTION AT FORWARD ANGLES FROM COLLISIONS OF LIGHT RELATIVISTIC NUCLEI, PART III: DATA TABLES

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ABSTRACT

This document contains data tables on microfiche of single particle inclusive cross sections of protons, deuterons, tritons, ^{3}He, ^{4}He, ^{6}He, ^{8}He, and π^-. The production of these fragments was measured in collisions of 1.05 GeV/A and 2.1 GeV/A proton, deuteron, alpha and carbon projectiles as well as 0.4 GeV/A alpha particles on targets of C, Cu, Pb, and H (from a CH_2-C subtraction), using a double focusing spectrometer. Only fragment emission in the region $0.5 \leq (p/Z)_{lab} \leq 8.7$ GV/c and $0° \leq \vartheta_{lab} \leq 12°$ is included.

This work was supported by the Director, Office of Energy Research, Division of Nuclear Physics of the Office of High Energy and Nuclear Physics of the U.S. Department of Energy under Contract DE-AC03-76SF00098.

In the pocket attached to the inside front cover of this report the reader should find eight microfiches containing data tables of fragmentation cross sections of relativistic light ions. These data were obtained during the course of an experiment at the Bevatron of the Lawrence Berkeley Laboratory. The experimental details and the analysis are described in Ref. 1. A presentation and discussion of the results can be found in Ref. 2 and 3.

The reaction types and energies are summarized in a TABLE OF CONTENTS together with the identification numbers of the corresponding microfiches (to be found in the upper left corner of a fiche). A detailed INDEX for each fiche follows. Cross sections of Z=1,2 fragments with the same nominal (lab) rigidity P/Z (GV/c) and transverse rigidity PT/Z (GV/c) are grouped together on a single frame of a fiche. The INDEX lists the values of P/Z, PT/Z (first two numbers in each entry) and the observed fragment types (P=proton, D=deuteron, T=triton, HE4=^{4}He, HE6=^{6}He, HE8=^{8}He) together with the address of the frame on the fiche where the data are tabulated. In case of negative pions, cross section data with the same nominal (lab) momentum P (GeV/c) but different transverse momenta PT (GeV/c) are grouped together on a single frame of a fiche. Correspondingly, the INDEX lists the values for P (first number in each entry) followed by up to five different PT values together with the address of the frame on the fiche where the data are tabulated. Frame addresses consist of a letter (A-O) indicating the row, and a two-digit column number. For example on fiche 068 the INDEX entry '2.00 .15 P D T HE3 HE4 ... E10' refers to the fifth row, tenth column of the fiche, where cross section data for protons, deuterons, tritons, ^{3}He, and ^{4}He at P/Z=2.0 GV/c and PT/Z=0.15 GV/c from 1.05 GeV/A α + C collisions are tabulated.

We have tried to fit some of the data, namely the longitudinal momentum distributions for $p_L^{Proj} \geq 0$ at $p_T=0$, and the transverse momentum distributions at $\beta_{Fragment} = \beta_{Beam}$ in terms of an exponential, which is most important for high fragment momenta, plus either a Gaussian or a second exponential, which dominate the lower momentum behavior. Here, p_L^{Proj} and p_T are the longitudinal momentum in the

projectile frame and the transverse momentum, respectively. The corresponding fit parameters are summarized on fiche 492. It should be noted that, although this parameterization gives reasonable fits to the data in most cases, there are some noteable exceptions.

Acknowledgments

This work was supported by the Director, Office of Energy Research, Division of Nuclear Physics of the Office of High Energy and Nuclear Physics of the U.S. Department of Energy under Contract DE-AC03-76SF00098.

TABLE OF CONTENTS

I. Data Tables

II. Fit Parameters

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* All hydrogen results were obtained from a CH_2-C subtraction.

FICHE 280 (Nuclear Fragments)

** 1.05 GEV PROTON

CARBON

.52	0.	P	
.52	.05	P	
.52	.10	P	
.64	0.	P	
.64	.08	P	
.64	.12	P	
.76	0.	P	
.76	.08	P	
.76	.15	P	
.79	0.	D	
.88	0.	P	D
1.01	0.	P	D
1.26	0.	P	D
1.26	.15	P	D
1.50	.08	P	D
1.50	.15	P	D
1.50	.29	P	D
1.76	.08	P	D
1.75	.15	P	D
1.75	.22	P	D
1.75	.29	P	D
1.75	.36	P	D
2.26	.15	D	

COPPER

.52	0.	P	
.52	.10	P	
.64	0.	P	
.64	.12	P	
.76	0.	P	
.76	.08	P	
.76	.15	P	
.79	0.	D	
1.51	0.	P	D
1.50	.08	P	D
1.50	.15	P	D
1.50	.29	P	D
1.76	.08	P	D
1.75	.15	P	D
1.75	.22	P	D
1.75	.29	P	D
1.75	.36	P	D

LEAD

.53	0.	P	
.53	.10	P	
.65	0.	P	
.65	.12	P	
.77	0.	P	
.77	.08	P	
.77	.15	P	
.81	0.	D	
1.51	0	P	D
1.51	.08	P	D
1.51	.15	P	D
1.51	.29	P	D
1.77	.08	P	D
1.76	.15	P	D
1.76	.22	P	D
1.76	.29	P	D
1.76	.36	P	D

'H'

.52	0.	P	
.52	.10	P	
.64	0.	P	
.64	.12	P	
.76	0.	P	
.76	.08	P	
.76	.15	P	
1.50	0.	P	D
1.50	.08	P	D
1.50	.15	P	D
1.50	.29	P	D
1.75	.15	P	
1.75	.22	P	D
1.75	.29	P	D
1.75	.36	P	D

** 2.10 GEV PROTON

CARBON

.52	0.	P	
.52	.05	P	
.52	.10	P	
.76	0.	P	
.76	.08	P	
.76	.15	P	
1.01	0.	P	D
1.01	.05	P	D
1.01	.10	P	D
1.01	.19	P	D
1.26	0.	P	D
1.26	.08	P	D
1.26	.15	P	D
1.26	.24	P	D
1.50	0.	P	D
1.50	.08	P	D
1.50	.15	P	D
1.50	.29	P	D
1.75	0.	P	D
1.75	.15	P	D
1.75	.29	P	D
2.00	0.	P	D
2.00	.08	P	D
2.00	.15	P	D
2.00	.29	P	D
2.25	.30	P	D
2.25	.43	P	D
2.50	0.	P	
2.50	.08	P	D
2.50	.15	P	D
2.50	.30	P	D
2.50	.44	P	D
2.75	.15	P	D
2.75	.22	P	D
2.88	.30	P	D

COPPER

.52	0.	P	
.52	.10	P	
.76	0.	P	
.76	.15	P	
1.01	0.	P	D
1.01	.05	P	D
1.01	.10	P	D
1.01	.19	P	D
1.26	0.	P	D
1.26	.08	P	D
1.26	.15	P	D
1.50	0.	P	D
1.50	.08	P	D
1.50	.15	P	D
1.50	.29	P	D
1.75	0.	P	D
1.75	.15	P	D
1.75	.29	P	D
2.00	0.	P	D
2.00	.08	P	D
2.00	.15	P	D
2.00	.29	P	D
2.25	.30	P	D
2.25	.43	P	D
2.50	0.	P	
2.50	.08	P	D
2.50	.15	P	D
2.50	.30	P	D
2.50	.44	P	D
2.75	.15	P	D
2.75	.22	P	D
2.88	.30	P	D

LEAD

.53	0.	P	
.53	.10	P	
.77	0.	P	
.77	.15	P	
1.01	0.	P	D
1.01	.05	P	D
1.01	.10	P	D
1.01	.19	P	D
1.26	0.	P	D
1.26	.15	P	D
1.51	0.	P	D
1.51	.08	P	D
1.51	.15	P	D
1.51	.29	P	D
1.76	0.	P	D
2.01	0.	P	D
2.01	.15	P	D
2.01	.29	P	D
2.26	.43	P	D
2.51	0.	P	D
2.51	.08	P	D
2.51	.15	P	D
2.51	.30	P	D
2.51	.44	P	D
2.66	.57	P	D
2.76	.15	P	
2.76	.44	P	D
2.89	.15	P	
2.89	.30	P	D

'H'

.52	0.	P	
.76	0.	P	
.76	.15	P	
1.01	0.	P	
1.01	.05	P	
1.01	.10	P	
1.01	.19	P	D

A01				
B01				
C01				
D01	.52	0.	P	
E01	.52	.10	P	
F01	.64	0.	P	
G01	.64	.12	P	
H01	.76	0.	P	
I01	.76	.08	P	
J01	.76	.15	P	
K01	1.50	0.	P	D
L01	1.50	.08	P	D
M01	1.50	.15	P	D
N01	1.50	.29	P	D
O01	1.75	.15	P	
A02	1.75	.22	P	D
B02	1.75	.29	P	D
C02	1.75	.36	P	D
D02				
E02				
F02				
G02				
H02				
I02				
J02				
K02				
L02				
M02				
N02				
O02	1.01	0.	P	D
A03	1.01	.05	P	D
B03	1.01	.10	P	D
C03	1.01	.19	P	D
D03	1.26	0.	P	D
E03	1.26	.08	P	D
F03	1.26	.15	P	D
G03	1.26	.24	P	D
H03	1.50	0.	P	D
I03	1.50	.08	P	D
J03	1.50	.15	P	D
K03	1.50	.29	P	D
L03	1.75	0.	P	D
M03	1.75	.15	P	D
N03	1.75	.29	P	D
O03	2.00	0.	P	D
A04	2.00	.08	P	D
B04	2.00	.15	P	D
C04	2.00	.29	P	D
D04	2.25	.30	P	D
E04	2.25	.43	P	D
F04	2.50	0.	P	
G04	2.50	.08	P	D
H04	2.50	.15	P	D
I04	2.50	.30	P	D
J04	2.50	.44	P	D
K04	2.75	.15	P	D
L04	2.75	.30	P	
M04	2.75	.44	P	D
N04	2.88	.08	P	
O04	2.88	.15	P	D
A05	2.88	.22	P	D
B05	2.88	.30	P	D
C05				
D05				
E05				
F05				
G05				
H05				

I05	.76	.15	P	
J05	1.01	0.	P	D
K05	1.01	.05	P	D
L05	1.01	.10	P	D
M05	1.01	.19	P	D
N05	1.26	0.	P	D
O05	1.26	.15	P	D
A06	1.50	0.	P	D
B06	1.50	.08	P	D
C06	1.50	.15	P	D
D06	1.50	.29	P	D
E06	1.75	0.	P	D
F06	2.00	0.	P	D
G06	2.00	.15	P	D
H06	2.00	.29	P	
I06	2.25	.43	P	D
J06	0.	0.	P	
K06	2.50	.08	P	D
L06	2.50	.15	P	D
M06	2.50	.30	P	D
N06	2.50	.44	P	D
O06	2.65	.57	D	
A07	2.75	.15	P	D
B07	2.75	.44	P	D
C07	2.88	.15	P	D
D07	2.88	.30	P	D
E07				
F07				
G07				
H07				
I07				
J07				
K07				
L07				
M07				
N07				
O07				
A08				
B08				
C08				
D08				
E08				
F08				
G08				
H08				
I08				
J08				
K08				
L08				
M08				
N08				
O08				
A09				
B09				
C09				
D09				
E09				
F09				
G09				
H09				
I09				
J09				
K09				
L09				
M09				
N09				
O09				
A10				

B10	1.26	0.	P	
C10	1.26	.15	P	D
D10	1.50	0.	P	
E10	1.50	.08	P	D
F10	1.50	.15	P	D
G10	1.50	.29	P	D
H10	1.75	0.	P	D
I10	2.00	0.	P	D
J10	2.00	.15	P	D
K10	2.00	.29	P	D
L10	2.25	.43	P	D
M10	2.47	.07	P	
N10	2.50	.15	P	D
O10	2.50	.30	P	D
A11	2.50	.44	P	D
B11	2.65	.57	P	D
C11	2.75	.15	P	
D11	2.75	.44	P	
E11	2.88	.15	P	
F11	2.88	.30	P	D
G11				
H11				
I11				
J11				
K11				
L11				
M11				
N11				
O11				
A12				
B12				
C12				
D12				
E12				
F12				
G12				
H12				
I12				
J12				
K12				
L12				
M12				
N12				
O12				
A13				
B13				
C13				
D13				
E13				
F13				
G13				
H13				
I13				
J13				
K13				
L13				
M13				
N13				
O13				
A14				
B14				
C14				
D14				
E14				
F14				
G14				
H14				
I14				

J14				
K14				
L14				
M14				
N14				
O14				
A15				
B15				
C15				
D15				
E15				
F15				
G15				
H15				
I15				
J15				
K15				
L15				
M15				
N15				

FICHE 293 (Nuclear Fragments)

** 1.05 GEV/A DEUTERON

CARBON

.52	0.	P			A01
.52	.04	P			B01
.52	.08	P			C01
.52	.10	P			D01
.76	.08	P	HE3		E01
.88	0.	P	D	HE3	F01
.88	.15	P	D	HE3	G01
1.01	0.	P	D	HE3	H01
1.01	.08	P	D	HE3	I01
1.01	.15	P	D	HE3	J01
1.26	0.	P	D		K01
1.36	0.	P	D		L01
1.50	0.	P	D	HE3	M01
1.50	.08	P	D	HE3	N01
1.50	.15	P	D	T HE3	O01
1.50	.29	P	D	T HE3	A02
1.75	0.	P			B02
1.75	.04	P	D	HE3	C02
1.75	.08	P	D	T	D02
1.75	.15	P	D	HE3	E02
1.75	.29	P	D	T HE3	F02
1.75	.36	P	D	T HE3	G02
2.00	0.	P			H02
2.00	.08	P	D	HE3	I02
2.00	.15	P	D	T HE3	J02
2.00	.29	P	D	T HE3	K02
2.00	.36	P	D	T	L02
2.25	0.	P	D	T	M02
2.25	.15	P	D	T	N02
2.25	.30	P	D	T	O02
2.25	.43	P	D	T	A03
2.50	0.	P	D	T	B03
2.50	.08	P	D	T	C03
2.50	.15	P	D	T	D03
2.50	.30	P	D	T	E03
2.50	.44	P	D	T	F03
2.75	0.	P	D	T	G03
2.75	.15	P	D	T	H03
2.75	.30	P	D	T	I03
2.75	.44	P	D	T	J03
3.00	0.	D			K03
3.00	.15	D	T		L03
3.00	.30	D	T		M03
3.00	.44	D	T		N03
3.00	.58	D	T		O03
3.25	0.	D			A04
3.25	.08	D			B04
3.25	.15	D			C04
3.25	.30	D	T		D04
3.25	.58	D	T		E04
3.25	.65	D	T		F04
3.35	.44	D	T		G04
3.50	.08	D			H04
3.50	.10	D			I04
3.50	.13	D			J04
3.50	.15	D			K04
3.50	.22	D			L04
3.45	.30	D			M04
3.50	.58	D			N04
					O04
					A05
					B05
					C05
					D05
					E05
					F05
					G05
					H05

COPPER

.52	0.	P			A01
1.01	0.	P	D		B01
1.01	.08	P	D	HE3	C01
1.01	.15	P	D	HE3	D01
1.26	0.	P	D	T	E01
1.50	0.	P	D		F01
1.50	.15	P	D	T HE3	G01
1.50	.29	P	D	T HE3	H01
1.75	0.	P			I01
1.75	.08	P	D		J01
1.75	.15	P	D		K01
1.75	.29	P	D	T HE3	L01
2.00	0.	P	D		M01
2.00	.15	P	D	T HE3	N01
2.00	.29	P	D	T HE3	O01
2.25	.43	P	D	T	A02
2.50	0.	P	D	T	B02
2.50	.15	P	D	T	C02
2.50	.30	P	D	T	D02
2.50	.44	P	D	T	E02
2.75	0.	P	D		F02
3.25	0.	D			G02
3.25	.30	D	T		H02
3.25	.58	D	T		I02
3.25	.65	D	T		J02
3.35	.44	D	T		K02
3.50	.10	D			L02
3.50	.13	D			M02
3.50	.15	D			N02
3.50	.22	D			O02
3.45	.30	D			A03
3.50	.58	D			B03

LEAD

.53	0.	P			C03
.89	0.	P	D	HE3	D03
.89	.15	P	D	HE3	E03
1.01	0.	P	D	HE3	F03
1.01	.08	P	D	HE3	G03
1.01	.15	P	D	HE3	H03
1.26	0.	P	D	T	I03
1.37	0.	D	T		J03
1.51	0.	P	D		K03
1.51	.15	P	D	T HE3	L03
1.51	.29	P	D	T HE3	M03
1.76	0.	P			N03
1.76	.08	P	D		O03
1.76	.15	P	D	T	A04
1.76	.22	P	D	T HE3	B04
1.76	.29	P	D	T HE3	C04
2.01	0.	P	D		D04
2.01	.15	P	D	T	E04
2.01	.29	P	D	T HE3	F04
2.26	.43	P	D	T	G04
2.51	0.	P	D	T	H04
2.51	.15	P	D	T	I04
2.51	.30	P	D	T	J04
2.51	.44	P	D	T	K04
2.76	0.	P	D		L04
3.26	0.	D			M04
3.26	.30	D	T		N04
3.26	.58	D	T		O04
3.26	.65	D	T		A05
3.36	.44	D	T		B05
3.50	.10	D			C05
3.50	.13	D			D05
3.50	.15	D			E05
3.50	.22	D			F05
					G05
					H05
					I05
					J05
					K05
					L05
					M05

'H'

.52	0.	P			N05
1.01	0.	P	D		O05
1.01	.08	P	D		A06
1.01	.15	P	D		B06
1.26	0.	P	D	T HE3	C06
1.31	0.	P	D		D06
1.50	0.	P			E06
1.50	.15	P	D	HE3	F06
1.50	.29	P	D		G06
1.75	0.	P			H06
1.75	.08	P	D		I06
1.75	.15	P	D		J06
1.75	.29	P	D		K06
2.00	0.	P			L06
2.00	.15	P	D		M06
2.00	.29	P	D		N06
2.25	.43	P	D		O06
2.50	0.	P	D		A07
2.50	.15	P	D		B07
2.50	.30	P	D		C07
2.50	.44	P	D	T	D07
2.75	0.	P	D		E07
3.00	0.	D			F07
3.25	.30	D	T		G07
3.25	.58	D	T		H07
3.25	.65	D	T		I07
3.35	.44	D	T		J07
3.50	.10	D			K07
3.50	.13	D			L07
3.50	.15	D			M07
3.50	.22	D			N07
3.45	.30	D			O07
					A08
					B08
					C08
					D08
					E08
					F08
					G08
					H08
					I08
					J08
					K08
					L08
					M08
					N08
					O08
					A09
					B09
					C09
					D09
					E09
					F09
					G09
					H09
					I09
					J09
					K09
					L09
					M09
					N09
					O09
					A10
					B10
					C10
					D10
					E10
					F10
					G10
					H10
					I10
					J10
					K10
					L10
					M10
					N10
					O10
					A11
					B11
					C11
					D11
					E11
					F11
					G11
					H11
					I11
					J11
					K11
					L11
					M11
					N11
					O11
					A12
					B12
					C12
					D12
					E12
					F12
					G12
					H12

FICHE 298 (Nuclear Fragments)

** 2.10 GEV/A DEUTERON

CARBON

1.01	0.	P	D		
1.01	.08	P	D		
1.01	.15	P	D		
1.33	0.	P	D	T	
1.33	.15	P	D	T	
1.50	0.	P	D	T	
1.50	.15	P	D	T	
1.50	.29	P	D	T	
1.88	0.	P	D	T	HE3
1.88	.15	P	D	T	HE3
1.88	.29	P	D	T	HE3
2.00	0.	P	D	T	
2.00	.15	P	D	T	
2.00	.29	P	D	T	
2.35	0.	P	D		
2.35	.15	P	D	T	
2.35	.30	P	D		
2.35	.44	P	D	T	
2.65	.15	P	D		
2.65	.30	P	D	T	
2.65	.44	P	D	T	
2.65	.55	P	D	T	
2.73	0.	P			
2.88	.08	P	D		
2.88	.15	P	D		
2.88	.22	P	D		
2.88	.30	P	D	T	
2.88	.44	P	D	T	
2.88	.58	P	D	T	
2.97	0.	P	D		
2.97	.04	P			
3.10	.15	P	D	T	
3.10	.30	P	D		
3.10	.44	P	D	T	
3.10	.58	P	D	T	
3.19	0.	P			
3.40	0.	P			
3.40	.15	P	D	T	
3.40	.30	P	D	T	
3.40	.58	P	D	T	
3.75	0.	P	D	T	
3.75	.15	P	D	T	
3.75	.30	P	D	T	
3.75	.44	P	D	T	
3.75	.59	P	D	T	
3.75	.77	P	D	T	
4.10	0.	P	D		
4.10	.30	P	D		
4.10	.59	P	D		
4.50	0.	P	D		
4.50	.30	P	D		
4.50	.59	P	D		
4.50	.78	P	D		
5.00	0.	P	D		
5.00	.15	P	D		
5.00	.30	P	D		
5.00	.45	P	D		
5.00	.59	P	D		
5.00	.78	P	D		
5.25	.78	P	D		
5.50	.59	P	D		
5.50	.78	P	D		
5.76	.08	P	D		
5.76	.11	P	D		
5.76	.15	P	D		
5.76	.15	P	D		
5.76	.22	P	D		
5.76	.30	P	D		
5.76	.45	P	D		
5.76	.59	P	D		
5.76	.79	P	D		

COPPER

1.01	0.	P	D		
1.01	.15	P	D		
1.33	0.	P	T	D	
1.50	0.	P	D	T	
1.88	0.	P	D		
1.88	.15	P	D	T	HE3
2.00	0.	P	D	T	
2.00	.15	P	D	T	
2.00	.29	P	D	T	
2.35	0.	P	D		
2.35	.15	P	D	T	
2.35	.30	P	T	D	
2.65	.15	P	T	D	
2.65	.30	P	D	T	
2.65	.55	P	D	T	
2.73	0.	P			
2.88	.08	P	D	T	
2.88	.15	P	D		
2.88	.22	P	D	T	
2.88	.30	P	D	T	
2.88	.44	P	D	T	
2.88	.58	P	D	T	
2.97	0.	P			
3.10	.15	P	D		
3.10	.30	P	D	T	
3.10	.58	P	T	D	
3.19	0.	P			
3.40	0.	P			
3.75	.15	P	D	T	
3.75	.30	P	D	T	
3.75	.59	P	D	T	
3.75	.77	P	D	T	
4.50	0.	P	D		
4.50	.78	P	D		
5.00	0.	P	D		
5.00	.15	P	D		
5.00	.30	P	D		
5.00	.78	P	D		
5.50	.59	P	D		
5.50	.78	P	D		
5.76	.08	P	D		
5.76	.15	P	D		
5.76	.22	P	D		
5.76	.30	P	D		
5.76	.45	P	D		
5.76	.59	P	D		

LEAD

1.01	0.	P	D	HE3	
1.01	.15	P	D	HE3	
1.33	0.	P	D	T	HE3
1.51	0.	P	D	T	HE3
1.88	0.	P	D	T	
1.88	.15	P	D	T	HE3
2.01	0.	P	D	T	
2.01	.15	P	D	T	
2.01	.29	P	D	T	
2.36	0.	P	D		
2.36	.15	P	D	T	
2.36	.30	P	D	T	
2.66	.15	P	D		
2.66	.30	P	D	T	
2.66	.55	P	D	T	
2.73	0.	P			
2.89	.08	P	D	T	
2.89	.15	P	D	T	
2.89	.22	P	D		
2.89	.30	P	D	T	
2.89	.44	P	D	T	
2.89	.58	P	D	T	
2.97	0.	P	D		
3.11	.15	P	D		
3.11	.30	P	D	T	
3.11	.58	P	D	T	
3.19	0.	P	D		
3.41	0.	P			
3.76	0.	P	D	T	
3.76	.15	P	D	T	
3.76	.30	P	D	T	
3.76	.59	P	D	T	
3.76	.77	P	D	T	
4.51	0.	P	D		
4.51	.78	P	D		
5.01	.15	D			
5.01	.30	D			
5.01	.78	D			
5.51	.59	D			
5.51	.78	D			
5.77	.08	D			
5.77	.15	D			
5.77	.22	D			
5.77	.30	D			
5.77	.45	D			

'H'

1.01	0.	P			
1.01	.15	P			
1.33	0.	P	D		
1.50	0.	P	D		
1.88	0.	P	D		
1.88	.15	P	D	T	HE3
2.00	0.	P	D		
2.00	.15	P	D		
2.35	0.	P			
2.35	.15	P	D	T	
2.35	.30	P	D	T	
2.65	.15	P	D	T	
2.65	.30	P	D	T	
2.65	.55	P	D	T	
2.73	0.	P			
2.88	.08	P	D		
2.88	.15	P	D		
2.88	.22	P	D		
2.88	.30	P			
2.88	.44	P	D		
2.97	0.	P			
3.10	.15	P	D		
3.10	.30	P	D		
3.19	0.	P			
3.40	0.	P			
3.75	0.	P	D		
3.75	.15	P	D	T	
3.75	.30	P	D	T	
4.50	0.	P	D		
4.50	.30	P	D	T	
4.50	.59	P	D		
5.00	.15	D			
5.00	.30	D			
5.00	.59	D			
5.50	.59	D			
5.76	.15	D			
5.76	.22	D			
5.76	.30	D			
5.76	.45	D			

A01	B01	C01	D01	E01	F01
G01	H01	I01	J01	K01	L01
M01	N01	O01	A02	B02	C02
D02	E02	F02	G02	H02	I02
J02	K02	L02	M02	N02	O02
A03	B03	C03	D03	E03	F03
G03	H03	I03	J03	K03	L03
M03	N03	O03	A04	B04	C04
D04	E04	F04	G04	H04	I04
J04	K04	L04	M04	N04	O04
A05	B05	C05	D05	E05	F05
G05	H05	I05	J05	K05	L05
M05	N05	O05	A06	B06	C06
D06	E06	F06	G06	H06	I06
J06	K06	L06	M06	N06	O06
A07	B07	C07	D07	E07	F07
G07	H07	I07	J07	K07	L07
M07	N07	O07	A08	B08	C08
D08	E08	F08	G08	H08	I08
J08	K08	L08	M08	N08	O08
A09	B09	C09	D09	E09	F09
G09	H09	I09	J09	K09	L09
M09	N09	O09	A10	B10	C10
D10	E10	F10	G10	H10	I10
J10	K10	L10	M10	N10	O10
A11	B11	C11	D11	E11	F11
G11	H11	I11	J11	K11	L11
M11	N11	O11	A12	B12	C12
D12	E12	F12	G12	H12	I12
J12	K12	L12	M12	N12	O12
A13	B13	C13	D13	F13	F13
G13	H13	I13	J13	K13	L13
M13	N13	O13	A14	B14	C14
D14	E14	F14	G14	H14	I14
J14	K14	L14	M14	N14	O14
A15	B15	C15			

FICHE 068 (Nuclear Fragments)

** 0.40 GEV/A ALPHA

CARBON

.94	0.	P D HE3 HE4	A01
.94	.02	P D HE3 HE4	B01
.94	.05	P D HE3 HE4	C01
.94	.07	P D HE3 HE4	D01
.94	.10	P D HE3 HE4	E01
.94	.15	P D HE3 HE4	F01
.94	.19	P D HE3 HE4	G01
1.09	0.	P D HE3 HE4	H01
1.09	.15	P D HE3 HE4	I01
1.24	0.	P D T HE3	J01
1.24	.15	P D T HE3 HE4	K01
1.42	0.	P D HE3 HE4	L01
1.42	.15	P D T HE3 HE4	M01
1.42	.29	P D T HE3 HE4	N01
1.64	0.	D HE3 HE4	O01
1.64	.15	P D T HE3 HE4	A02
1.64	.29	P D T HE3 HE4	B02
1.87	.05	D HE4	C02
1.87	.07	D T HE4	D02
1.87	.10	D T HE4	E02
1.87	.15	D HE4	F02
1.86	.22	P D T HE4	G02
1.86	.29	P D T HE4	H02
1.86	.38	P D T HE4	I02
2.13	0.	D T	J02
2.13	.15	D T	K02
2.13	.29	D T	L02
2.48	0.	D T	M02
2.48	.29	D T	N02
2.48	.43	D T	O02
2.80	0.	T	A03
2.80	.04	T	B03
2.80	.07	T	C03
2.80	.15	T	D03
2.80	.29	T	E03
2.80	.44	T	F03
2.80	.57	T	G03
3.17	0.	T	H03
3.17	.29	T	I03
			J03

COPPER

.94	0.	P HE4	K03
.94	.07	P D HE3 HE4	L03
.94	.15	P HE3 HE4	M03
.94	.19	P D HE3 HE4	N03
1.87	.05	D HE4	O03
1.87	.07	D HE4	A04
1.87	.10	D T HE4	B04
1.87	.15	D HE4	C04
1.87	.22	D T HE4	D04
1.86	.29	P D T HE4	E04
1.87	.38	D T HE4	F04
2.13	0.	D T	G04
2.80	0.	T	H04
2.80	.15	T	I04
2.80	.29	T	J04
			K04

LEAD

1.00	0.	HE4	L04
.94	.03	P D HE3 HE4	M04
.94	.05	P D HE3 HE4	N04
.94	.07	P D HE3 HE4	O04
.94	.10	P D HE3 HE4	A05
.94	.15	P D HE3 HE4	B05
.94	.19	P D HE3 HE4	C05
1.10	0.	P HE4	D05
1.65	0.	D HE3 HE4	E05
1.64	.29	P D T HE4	F05
1.87	.05	D HE4	G05
1.87	.07	D HE4	H05
1.87	.10	D T HE4	I05
1.87	.15	D HE4	J05
1.87	.22	D T HE4	K05
1.87	.29	D T HE4	L05
1.87	.38	D T HE4	M05
2.14	0.	D	N05
2.48	0.	D T	O05
2.48	.29	D T	A06
2.48	.43	D T	B06
2.80	0.	T	C06
2.80	.07	T	D06
2.80	.15	T	E06
2.80	.29	T	F06
2.80	.44	T	G06
2.80	.57	T	H06
3.17	0.	T	I06
3.17	.30	T	J06
			K06

'H'

.94	0.	P D	L06
.94	.07	P D HE3	M06
.94	.15	P D	N06
.94	.19	P D	O06
1.87	.05	D HE4	A07
1.87	.07	D HE4	B07
1.87	.10	D HE4	C07
1.87	.15	D HE4	D07
1.87	.22	D T HE4	E07
1.87	.29	D T	F07
1.87	.38	D	G07
2.13	0.	D T	H07
2.80	0.	T	I07
2.80	.15	T	J07
2.80	.29	T	K07
			L07

** 1.05 GEV/A ALPHA

CARBON

.52	0.	P	M07
.76	0.	P HE3	N07
.76	.15	P HE3	O07
.79	0.	D T HE4	A08
1.01	0.	P D HE3	B08
1.01	.15	P D HE3 HE4	C08
1.26	0.	P D T HE3 HE4	D08
1.26	.15	P D T HE3	E08
1.50	0.	P D	F08
1.50	.15	P D T HE3 HE4	G08
1.50	.29	P D T HE3 HE4	H08
1.75	0.	P D HE4	I08
1.75	.02	P D HE3	J08
1.75	.04	P D HE3 HE4	K08
1.75	.08	P D HE3	L08
1.75	.13	P D HE3 HE4	M08
1.75	.15	P D T HE3 HE4	N08
1.75	.17	P D T HE3 HE4	O08
1.75	.22	P D T HE3 HE4	A09
1.75	.29	P D T HE3 HE4	B09
1.75	.34	P D T HE3 HE4	C09
2.00	0.	P D	D09
2.00	.15	P D T HE3 HE4	E09
2.00	.29	P D T HE3 HE4	F09
2.25	0.	P D HE3	G09
2.25	.15	P D T HE3 HE4	H09
2.25	.30	P D T HE3 HE4	I09
2.25	.43	P D T HE3 HE4	J09
2.63	0.	P HE3	K09
2.63	.08	P D T HE3	L09
2.63	.15	P D T HE3	M09
2.63	.22	P D T HE3 HE4	N09
2.63	.30	P D T HE3 HE4	O09
2.63	.44	P D T HE3 HE4	A10
3.00	0.	P D HE3	B10
3.00	.15	P D T HE3 HE4	C10
3.00	.30	P D T HE3 HE4	D10
3.00	.44	P D T HE3 HE4	E10
3.00	.58	P D T HE3 HE4	F10
3.50	.08	D HE4	G10
3.50	.15	D T HE4	H10
3.50	.22	D T HE4	I10
3.50	.30	D T HE4	J10
3.50	.44	D T HE4	K10
3.50	.58	D T HE4	L10
3.50	.72	D T HE4	M10
4.00	0.	D T	N10
4.00	.15	D T	O10
4.00	.30	D T	A11
4.00	.59	D T	B11
4.00	.77	D T	C11
4.46	0.	D T	D11
4.46	.04	D T	E11
4.46	.07	D T	F11
4.46	.15	D T	G11
4.54	.30	D T	H11
4.60	.45	D T	I11
4.60	.59	D T	J11
4.60	.78	D T	K11
5.25	0.	T	L11
5.25	.15	T	M11
5.25	.30	T	N11
5.25	.45	T	O11
5.25	.59	T	A12
5.25	.78	T	B12
6.00	0.	T	C12
6.00	.30	T	D12
6.00	.45	T	E12
6.00	.59	T	F12
6.00	.79	T	G12
			H12

COPPER

.76	0.	P HE3	I12
1.01	0.	P D HE3	J12
1.01	.15	P D HE3 HE4	K12
1.50	0.	P D T	L12
1.50	.29	P D T HE3 HE4	M12
1.75	0.	P D	N12
1.75	.15	P D T HE3 HE4	O12
1.75	.29	P D T HE3 HE4	A13
2.00	0.	P D T HE3	B13
2.00	.29	P D T HE3	C13
2.25	0.	P D T HE3	D13
2.25	.30	P D T HE3	E13
2.63	0.	P HE3 HE4	F13
2.63	.15	P D T HE3	G13
			H13
			I13
			J13
			K13
			L13
			M13
			N13
			O13
			A14
			B14
			C14
			D14
			E14
			F14
			G14
			H14
			I14

2.63	.30	P D T HE3 HE4	J14
3.00	0.	P D HE3 HE4	K14
3.00	.30	P D T HE3 HE4	L14
3.50	.08	P D HE4	M14
3.50	.15	D T HE4	N14
3.50	.22	D T HE4	O14
3.50	.30	D T HE4	A15
3.50	.58	D T HE4	B15
4.00	0.	D	C15
4.00	.30	D T	D15
4.46	0.	D T	E15
4.60	.30	D T	F15
5.25	0.	T	G15
5.25	.30	T	H15
6.00	0.	T	I15
6.00	.30	T	J15
			K15
			L15

LEAD

			M15
.77	0.	P HE3	N15
1.01	0.	P D HE3	O15
1.01	.15	P D HE3 HE4	A16
1.51	0.	P D T	B16
1.51	.29	P D T HE3	C16
1.76	0.	P D T	D16
1.76	.15	P D T HE3	E16
1.76	.29	P D T HE3	F16
2.01	0.	P D T HE3 HE4	G16
2.01	.29	P D T HE3	H16
2.26	0.	P D T HE3	I16
2.26	.30	P D T HE3	J16
2.63	0.	P D HE3	K16
2.63	.15	P D T HE3	L16
2.63	.30	P D T HE3 HE4	M16
3.01	0.	P D T HE3 HE4	N16
3.01	.30	P D T HE3 HE4	O16
3.51	.08	D HE4	A17
3.51	.15	D HE4	B17
3.51	.22	D T HE4	C17
3.51	.30	D T HE4	D17
3.51	.58	D T HE4	E17
4.01	0.	D	F17
4.01	.30	D T	G17
4.46	0.	D T	H17
4.61	.30	D T	I17
5.26	0.	T	J17
5.26	.30	T	K17
6.01	0.	T	L17
6.01	.30	T	M17
			N17

CONT'D ON ANOTHER FICHE O17

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                                        A01
** 1.05   GEV/A ALPHA                   B01
 (CONTINUED)                            C01
                                        D01
 'H'                                    E01
                                        F01
  .52 0.     P                          G01
  .76 0.     P HE3                      H01
 1.01 0.     P D                        I01
 1.01  .15   P                          J01
 1.50 0.     P D                        K01
 1.50  .29   P D                        L01
 1.75 0.     P D                        M01
 1.75  .15   P D HE3                    N01
 1.75  .29   P D HE3                    O01
 2.00 0.     P D                        A02
 2.00  .29   P D HE3                    B02
 2.25 0.     P HE3                      C02
 2.25  .30   P D HE3                    D02
 2.63 0.     D HE3                      E02
 2.63  .15   P D HE3                    F02
 2.63  .30   P D HE3 HE4                G02
 3.00 0.     P D HE3                    H02
 3.00  .30   P D HE3 HE4                I02
 3.50  .08   D HE4                      J02
 3.50  .15   D HE4                      K02
 3.50  .22   D HE4                      L02
 3.50  .30   D HE4                      M02
 3.50  .58   D T                        N02
 3.88 0.     D                          O02
 4.60 0.     D T                        A03
 4.60  .30   D T                        B03
 5.25 0.     T                          C03
 5.25  .30   T                          D03
 6.00 0.     T                          E03
 6.00  .30   T                          F03
                                        G03
** 2.10   GEV/A ALPHA                   H03
                                        I03
 CARBON                                 J03
                                        K03
  .52 0.     P                          L03
  .76 0.     P HE3                      M03
  .76  .15   P HE3                      N03
 1.01 0.     P D HE3                    O03
 1.01  .15   P D HE3 HE4                A04
 1.26 0.     P D HE3 HE4                B04
 1.50 0.     P D T HE3 HE4              C04
 1.50  .15   P D T HE3 HE4              D04
 1.50  .29   P D T HE3                  E04
 1.75 0.     P D T HE3 HE4              F04
 2.00 0.     P D T HE3 HE4              G04
 2.00  .29   P D HE3                    H04
 2.25 0.     P D                        I04
 2.76  .15   T                          J04
 2.26 0.     HE3                        K04
 2.50 0.     P D                        L04
 2.75 0.     P                          M04
 2.75  .15   P D HE3                    N04
 2.75  .30   P D T HE3                  O04
 2.75  .44   P D T HE3                  A05
 2.75  .57   P D T HE3 HE4              B05
 2.88 0.     P D                        C05
 2.88  .04   P D HE3                    D05
 2.88  .08   P D T                      E05
 2.88  .15   P D T HE3                  F05
 2.88  .22   P D T HE3                  G05
 2.88  .30   P D T HE3                  H05
 2.88  .44   P D T HE3 HE4              I05
 2.88  .58   P D T HE3                  J05
 3.05 0.     P D HE3                    K05
 3.50 0.     P D HE3                    L05
 3.50  .15   P D T HE3                  M05
 3.50  .30   P D T HE3                  N05
 3.50  .44   P D T HE3 HE4              O05
 3.50  .58   P D T HE3 HE4              A06
 3.95 0.     P D HE3                    B06
 3.95  .15   P D T HE3                  C06
 3.95  .30   P D T HE3                  D06
 3.95  .59   P D T HE3 HE4              E06
 4.35 0.     P D HE3                    F06
 4.35  .15   P D T HE3                  G06
 4.35  .30   P D T HE3                  H06
 4.35  .45   P D T HE3 HE4              I06
 4.35  .59   P D T HE3 HE4              J06
 4.35  .73   P D T HE3 HE4              K06
 5.10 0.     D                          L06
 5.11  .15   HE4                        M06
 5.10  .30   D HE4                      N06
 5.10  .45   D T HE4                    O06
 5.10  .59   D T HE4                    A07
 5.10  .78   D T HE4                    B07
 5.76  .11   D HE4                      C07
 5.76  .15   D HE4                      D07
 5.76  .22   D HE4                      E07
 5.76  .30   D HE4                      F07
 5.76  .45   D HE4                      G07
 5.76  .59   D T HE4                    H07
 5.76  .74   D T HE4                    I07
 5.76  .79   D T HE4                    J07
 6.75 0.     D T                        K07
 6.75  .15   D T                        L07
 6.75  .30   D T                        M07
 6.75  .45   D T                        N07
 6.75  .60   D T                        O07
 6.75  .74   D T                        A08
 7.75 0.     T                          B08
 7.75  .30   T                          C08
 7.73  .60   T                          D08
 8.69 0.     T                          E08
 8.69  .15   T                          F08
 8.69  .30   T                          G08
 8.69  .45   T                          H08
 8.69  .60   T                          I08
 8.69  .74   T                          J08
                                        K08
 COPPER                                 L08
                                        M08
  .76 0.     P HE3                      N08
 1.01 0.     P D HE3 HE4                O08
 1.01  .15   P D HE3 HE4                A09
 1.50 0.     P D T HE3                  B09
 1.50  .29   P D T HE3 HE4              C09
 2.00 0.     P D T HE3                  D09
 2.50 0.     P D T                      E09
 2.75 0.     P T                        F09
 2.75  .30   P D T HE3                  G09
 2.88 0.     P                          H09
 2.88  .15   P D                        I09
 2.88  .30   P D T HE3                  J09
 2.88  .44   P D T HE3                  K09
 2.88  .58   P D T HE3                  L09
 3.50 0.     P D T HE3 HE4              M09
 3.50  .30   P D T HE3                  N09
 3.95 0.     P D HE3                    O09
 3.95  .30   P D T HE3                  A10
 4.35 0.     P D HE3                    B10
 4.35  .30   P D T HE3                  C10
 5.76  .15   D HE4                      D10
 5.76  .30   D HE4                      E10
 6.75 0.     D T                        F10
 6.75  .30   D T                        G10
 7.75 0.     T                          H10
 7.73  .60   T                          I10
 8.69 0.     T                          J10
 8.69  .30   T                          K10
                                        L10
 LEAD                                   M10
                                        N10
  .77 0.     P HE3                      O10
 1.01 0.     P D HE3 HE4                A11
 1.01  .15   P D HE3 HE4                B11
 1.51 0.     P D T HE3                  C11
 1.51  .29   P D T HE3 HE4              D11
 2.01 0.     P D T HE3                  E11
 2.51 0.     P                          F11
 2.76 0.     P                          G11
 2.76  .30   P D T HE3                  H11
 2.89 0.     P                          I11
 2.89  .15   P D T HE3                  J11
 2.89  .30   P D T HE3                  K11
 2.89  .44   P D T HE3                  L11
 2.89  .58   P D T HE3                  M11
 3.51 0.     P D T HE3                  N11
 3.51  .30   P D T HE3                  O11
 3.96 0.     P D HE3                    A12
 3.96  .30   P D T HE3                  B12
 4.36 0.     P D HE3                    C12
 4.36  .30   P D T HE3                  D12
 5.77  .15   D HE4                      E12
 5.77  .30   D HE4                      F12
 6.76 0.     D                          G12
 6.76  .30   D                          H12
 7.76 0.     T                          I12
 7.73  .60   T                          J12
 8.70 0.     T                          K12
 8.70  .30   T                          L12
                                        M12
 'H'                                    N12
                                        O12
  .76 0.     P HE3                      A13
 1.01  .15   P D HE3                    B13
 1.50  .29   P D                        C13
 2.00 0.     P D                        D13
 2.50 0.     P                          E13
 2.75  .30   P D HE3 HE4                F13
 2.88 0.     P HE3                      G13
 2.88  .15   P D                        H13
 2.88  .30   P D                        I13
 2.88  .44   P D                        J13
 2.88  .58   P D                        K13
 3.50 0.     P D HE3                    L13
 3.50  .30   P D HE3                    M13
 3.95 0.     P HE3                      N13
 3.95  .30   P D T HE3 HE4              O13
 4.35 0.     P HE3                      A14
 4.35  .30   P D HE3                    B14
 5.76  .15   D HE4                      C14
 5.76  .30   D HE4                      D14
 6.75 0.     D                          E14
 6.75  .30   D                          F14
 7.75 0.     T                          G14
 7.73  .60   T                          H14
 8.69 0.     T                          I14
 8.69  .30   T                          J14
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FICHE 237 (Nuclear Fragments)

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** 1.05 GEV/A CARBON                                    A01
                                                        B01
CARBON                                                  C01
                                                        D01
                                                        E01
 .51 0.    P                                            F01
 .76 0.    P HE3                                        G01
 .76  .15  P HE3                                        H01
1.01 0.    P D HE3                                      I01
1.01  .08  P D HE3                                      J01
1.01  .15  P D HE3                                      K01
1.26 0.    P D HE3                                      L01
1.26  .15  P D HE3                                      M01
1.50 0.    P D HE3                                      N01
1.50  .08  P D T HE3 HE4                                O01
1.50  .15  P D T HE3 HE4                                A02
1.50  .29  P D T HE3                                    B02
1.75 0.    P                                            C02
1.75  .04  P D                                          D02
1.75  .08  P D T HE3                                    E02
1.75  .15  P D T HE3                                    F02
1.75  .22  P D T HE3                                    G02
1.75  .29  P D T HE3 HE4                                H02
1.75  .35  P D T HE3                                    I02
2.00 0.    P D HE3                                      J02
2.00  .08  P D HE3 HE4                                  K02
2.00  .15  P D T HE3 HE4                                L02
2.00  .29  P D T HE3 HE4                                M02
2.30 0.    P D HE3                                      N02
2.30  .08  P D T HE3                                    O02
2.30  .15  P D T HE3                                    A03
2.30  .30  P D T HE3 HE4                                B03
2.30  .43  P D T HE3 HE4                                C03
2.63 0.    P D HE3                                      D03
2.63  .04  P D HE3                                      E03
2.63  .08  P D T HE3 HE4                                F03
2.63  .15  P D T HE3 HE4                                G03
2.63  .22  P D T HE3 HE4                                H03
2.63  .30  P D T HE3 HE4                                I03
2.63  .44  P D T HE3 HE4                                J03
2.63  .53  P D T HE3 HE4                                K03
3.00 0.    D HE3 HE4                                    L03
3.00  .04  D HE3 HE4                                    M03
3.00  .08  D HE3 HE4                                    N03
3.00  .15  P D T HE3 HE4                                O03
3.00  .30  P D T HE3 HE4                                A04
3.00  .44  P D T HE3 HE4                                B04
3.00  .58  P D T HE3 HE4                                C04
3.25  .22  D T HE4                                      D04
3.50  .08  D T HE4                                      E04
3.50  .15  D T HE4                                      F04
3.50  .22  D T HE4                                      G04
3.50  .30  D T HE4                                      H04
3.50  .44  D T HE4                                      I04
3.50  .58  D T HE4                                      J04
3.50  .70  D T HE4                                      K04
4.00 0.    D T HE4                                      L04
4.00  .08  D HE4                                        M04
4.00  .15  D T HE4                                      N04
4.00  .30  D T HE4                                      O04
4.00  .44  D T HE4                                      A05
4.00  .59  D T                                          B05
4.00  .77  D T                                          C05
4.50 0.    D T HE6                                      D05
4.50  .08  D T HE6                                      E05
4.50  .15  D T HE6                                      F05
4.50  .30  D T HE6                                      G05
4.50  .45  D T                                          H05
4.50  .59  D T                                          I05
4.50  .78  D T                                          J05
5.25 0.    T HE6                                        K05
5.25  .04  T HE6                                        L05
5.25  .08  T HE6                                        M05
5.25  .15  T HE6                                        N05
5.25  .30  T HE6                                        O05
5.25  .45  T HE6                                        A06
5.25  .59  T                                            B06
5.25  .78  T                                            C06
6.00 0.    T HE6                                        D06
6.00  .15  T HE6                                        E06
6.00  .30  T HE6                                        F06
6.00  .45  T                                            G06
6.00  .59  T                                            H06
6.00  .79  T                                            I06
6.51 0.    HE8                                          J06
7.01 0.    HE8                                          K06
7.01  .04  HE8                                          L06
7.01  .08  HE8                                          M06
7.01  .15  HE8                                          N06
7.01  .30  HE8                                          O06
7.41 0.    HE8                                          A07
                                                        B07
COPPER                                                  C07
                                                        D07
1.01 0.    P D HE3                                      E07
1.01  .15  P D HE3                                      F07
1.26 0.    P D HE3                                      G07
1.50 0.    P D                                          H07
1.50  .08  P D T HE3                                    I07
1.50  .15  P D T HE3                                    J07
1.50  .29  P D T HE3                                    K07
1.75 0.    P D                                          L07
1.75  .08  P D T HE3                                    M07
1.75  .15  P D T HE3 HE4                                N07
1.75  .22  P D T HE3 HE4                                O07
1.75  .29  P D T HE3 HE4                                A08
1.75  .35  P D T HE3                                    B08
2.00 0.    P D HE3                                      C08
2.00  .15  P D T HE3                                    D08
2.00  .29  P D T HE3 HE4                                E08
2.30 0.    P D HE3                                      F08
2.30  .15  P D T HE3 HE4                                G08
2.63 0.    P D HE3                                      H08
2.63  .04  P D HE3                                      I08
2.63  .08  P D T HE3 HE4                                J08
2.63  .15  P D T HE3 HE4                                K08
2.63  .30  P D T HE3 HE4                                L08
2.63  .44  P D T HE3 HE4                                M08
3.00 0.    D HE3 HE4                                    N08
3.00  .04  D HE3 HE4                                    O08
3.00  .08  D HE3 HE4                                    A09
3.00  .15  P D T HE3 HE4                                B09
3.00  .30  P D T HE3 HE4                                C09
3.25  .22  D T HE3 HE4                                  D09
3.50  .08  D HE4                                        E09
3.50  .15  D T HE4                                      F09
3.50  .22  D T HE4                                      G09
3.50  .30  D T HE4                                      H09
3.50  .44  D T HE4                                      I09
3.50  .58  D T HE4                                      J09
3.50  .70  D T HE4                                      K09
4.00 0.    D HE4                                        L09
4.00  .08  D T HE4                                      M09
4.00  .15  D T HE4                                      N09
4.00  .30  D T HE4                                      O09
4.50 0.    D T HE6                                      A10
4.50  .08  D T HE6                                      B10
4.50  .30  D T HE6                                      C10
5.25 0.    T HE6                                        D10
5.25  .08  T HE6                                        E10
5.25  .15  T HE6                                        F10
5.25  .30  T HE6                                        G10
5.25  .45  T HE6                                        H10
5.25  .59  T                                            I10
5.25  .78  T                                            J10
6.00 0.    T HE6                                        K10
6.00  .30  T HE6                                        L10
7.01 0.    HE8                                          M10
7.01  .08  HE8                                          N10
                                                        O10
LEAD                                                    A11
                                                        B11
1.01 0.    P D HE3                                      C11
1.01  .15  P D HE3                                      D11
1.26 0.    P D HE3                                      E11
1.51 0.    P D T HE3                                    F11
1.51  .08  P D T HE3 HE4                                G11
1.51  .15  P D T HE3 HE4                                H11
1.51  .29  P D T HE3                                    I11
1.76 0.    P D                                          J11
1.76  .08  P D T HE3 HE4                                K11
1.76  .15  P D T HE3 HE4                                L11
1.76  .22  P D T HE3                                    M11
1.76  .29  P D T HE3                                    N11
1.76  .35  P D T HE3                                    O11
2.01 0.    P D HE3                                      A12
2.01  .15  P D T HE3 HE4                                B12
2.01  .29  P D T HE3                                    C12
2.31 0.    P D T HE3                                    D12
2.31  .15  P D T HE3 HE4                                E12
2.63 0.    P D T HE3                                    F12
2.63  .04  P D HE3                                      G12
2.63  .08  P D T HE3 HE4                                H12
2.63  .15  P D T HE3 HE4                                I12
2.63  .30  P D T HE3 HE4                                J12
2.63  .44  P D T HE3 HE4                                K12
3.01 0.    D HE3 HE4                                    L12
3.01  .04  D HE3 HE4                                    M12
3.01  .08  D T HE3 HE4                                  N12
3.01  .15  P D T HE3 HE4                                O12
3.01  .30  P D T HE3 HE4                                A13
3.26  .22  D T HE3 HE4                                  B13
3.51  .08  D HE4                                        C13
3.51  .15  D T HE4                                      D13
3.51  .22  D T HE4                                      E13
3.51  .30  D T HE4                                      F13
3.51  .44  D T HE4                                      G13
3.51  .58  D T HE4                                      H13
3.51  .70  D T HE4                                      I13
4.01 0.    D HE4                                        J13
4.01  .08  D HE4                                        K13
4.01  .15  D T HE4                                      L13
4.01  .30  D T HE4                                      M13
4.51 0.    D T HE6                                      N13
4.51  .08  D T HE6                                      O13
4.51  .30  D T HE6                                      A14
5.26 0.    T HE6                                        B14
5.26  .08  T HE6                                        C14
5.26  .15  T HE6                                        D14
5.26  .30  T HE6                                        E14
5.26  .45  T HE6                                        F14
5.26  .59  T                                            G14
5.26  .78  T                                            H14
6.01 0.    T                                            I14
6.01  .30  T HE6                                        J14
7.01 0.    HE8                                          K14
7.01  .08  HE8                                          L14
                                                        M14
'H'                                                     N14
                                                        O14
1.01 0.    P                                            A15
1.01  .15  P D                                          B15
1.26 0.    P D                                          C15
1.50 0.    P                                            D15
1.50  .15  P D                                          E15
1.50  .29  P D HE3                                      F15
1.75 0.    P                                            G15
1.75  .08  P D                                          H15
1.75  .15  P D HE3                                      I15
1.75  .22  P D HE3                                      J15
1.75  .29  P D                                          K15
1.75  .35  P D                                          L15
2.00 0.    P D HE3                                      M15
2.00  .15  P D HE3                                      N15
2.00  .29  P D HE3                                      O15
2.30 0.    P D HE3                                      A16
2.30  .15  P D T HE3                                    B16
2.63 0.    P D HE3                                      C16
2.63  .04  P D HE3                                      D16
2.63  .08  P D HE3 HE4                                  E16
2.63  .15  P D HE3 HE4                                  F16
2.63  .30  P D T HE3 HE4                                G16
3.00 0.    D HE3 HE4                                    H16
3.01  .04  HE3 HE4                                      I16
3.01  .08  HE3 HE4                                      J16
3.00  .15  P D HE3 HE4                                  K16
3.00  .30  P D T HE3 HE4                                L16
3.25  .22  D HE4                                        M16
3.50  .08  D HE4                                        N16
3.50  .15  D T HE4                                      O16
3.50  .22  D HE4                                        A17
3.50  .30  D T HE4                                      B17
4.00 0.    D                                            C17
4.00  .08  D HE4                                        D17
4.00  .15  D T HE4                                      E17
4.50 0.    D T HE6                                      F17
4.50  .08  D T HE6                                      G17
4.50  .30  D T HE6                                      H17
5.25 0.    T HE6                                        I17
5.25  .08  T HE6                                        J17
5.25  .15  T HE6                                        K17
5.25  .30  T HE6                                        L17
6.00 0.    T                                            M17
6.00  .30  T HE6                                        N17
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FICHE 236 (Nuclear Fragments)

			A01
** 2.10 GEV/A CARBON			B01
			C01
CARBON			D01
			E01
.51	0.	P	F01
1.01	0.	P D HE3	G01
1.01	.08	P D HE3	H01
1.01	.15	P D HE3	I01
1.50	0.	P D HE3 HE4	J01
2.09	0.	P D T HE3 HE4	K01
2.00	.04	P D T HE3 HE4	L01
2.00	.08	P D HE3	M01
2.00	.15	P D HE3	N01
2.00	.29	P D HE3	O01
2.00	.43	P D HE3	A02
2.35	0.	P D HE3	B02
2.35	.08	P D T HE3	C02
2.35	.15	P D HE3	D02
2.35	.30	P D T HE3	E02
2.35	.44	P D HE3	F02
2.65	0.	P D HE3	G02
2.65	.04	P D HE3	H02
2.65	.08	P D HE3	I02
2.65	.15	P D HE3	J02
2.65	.30	P D T HE3	K02
2.65	.53	P D T HE3	L02
2.88	0.	P D	M02
2.88	.04	P HE3	N02
2.88	.08	P D HE3 HE4	O02
2.88	.15	P D T HE3	A03
2.88	.22	P D T HE3 HE4	B03
2.88	.30	P D T HE3	C03
2.88	.44	P D T HE3	D03
2.88	.53	P D T HE3	E03
2.88	.58	P D T HE3	F03
3.10	0.	P D HE3	G03
3.10	.08	P D HE3	H03
3.10	.15	P D HE3 HE4	I03
3.10	.30	P D T HE3	J03
3.10	.53	P D T HE3	K03
3.20	.04	P HE3	L03
3.35	.08	P D HE3	M03
3.40	0.	P D HE3 HE4	N03
3.40	.15	P D HE3 HE4	O03
3.40	.30	P D HE3	A04
3.40	.44	P D T HE3	B04
3.75	0.	P D T HE3	C04
3.75	.04	P D T HE3 HE4	D04
3.75	.08	P D T HE3	E04
3.75	.11	P D T HE3 HE4	F04
3.75	.15	P D HE3 HE4	G04
3.75	.30	P D HE3 HE4	H04
3.75	.44	P D T HE3	I04
4.00	.15	P D T HE3	J04
4.10	0.	P D HE3	K04
4.10	.04	P D HE3	L04
4.10	.08	P D HE3	M04
4.30	.04	P D T HE3	N04
4.30	.08	P D T HE3	O04
4.30	.15	P D T HE3 HE4	A05
4.30	.30	P D T HE3 HE4	B05
4.30	.45	P D T HE3 HE4	C05
4.35	0.	P D T HE3	D05
4.35	.45	P D T HE3 HE4	E05
4.35	.59	P D T HE3	F05
4.35	.77	P D T HE3	G05
4.50	.04	P D T HE3 HE4	H05
4.50	.08	P T HE3	I05
4.70	0.	P D T HE3 HE4	J05
4.70	.04	P HE3	K05
4.70	.08	P D T HE3 HE4	L05
4.70	.15	P D T HE3 HE4	M05
4.70	.30	P D T HE3 HE4	N05
4.70	.45	P D T HE3 HE4	O05
5.00	0.	D HE4	A06
5.00	.08	D HE4	B06
5.00	.15	P D T HE3 HE4	C06
5.00	.30	P D T HE3 HE4	D06
5.00	.45	P D T HE3 HE4	E06
5.00	.59	P D T HE3 HE4	F06
5.00	.78	P D T	G06
5.30	.08	D HE4	H06
5.30	.15	D HE4	I06
5.40	.30	D T HE4	J06
5.55	.22	D T HE4	K06
5.60	.15	D HE4	L06
5.76	.08	D HE4	M06
5.76	.15	D HE4	N06
5.76	.30	D T HE4	O06
5.76	.45	D T HE4	A07
5.76	.59	D T HE4	B07
5.76	.79	D T	C07
5.86	.30	D T HE4	D07
6.20	0.	D HE4	E07
6.20	.45	D T HE4	F07
6.25	.08	D HE4	G07
6.25	.15	D HE4	H07
6.25	.30	D T HE4	I07
6.38	.08	D HE4	J07
6.38	.15	D HE4	K07
6.50	0.	D HE4	L07
6.50	.08	D HE4	M07
6.50	.15	D T HE4	N07
6.50	.45	D T HE4	O07
6.50	.60	D T	A08
6.50	.79	D T	B08
6.85	0.	D	C08
7.20	0.	T	D08
7.20	.08	T	E08
7.75	0.	T HE6	F08
7.75	.15	T HE6	G08
7.75	.30	T HE6	H08
7.75	.45	T HE6	I08
7.75	.60	T	J08
7.75	.79	T	K08
8.65	0.	T HE6	L08
8.65	.30	T HE6	M08
8.65	.45	T HE6	N08
8.65	.60	T	O08
8.65	.79	T	A09
			B09
COPPER			C09
			D09
1.01	0.	P D HE3	E09
1.01	.08	P D HE3	F09
2.00	0.	P D T HE3 HE4	G09
2.65	0.	P D	H09
2.65	.53	P D T HE3	I09
2.88	0.	P D	J09
2.88	.08	P D HE3	K09
2.88	.15	P D T HE3	L09
2.88	.44	P D T HE3	M09
2.88	.58	P D T HE3	N09
3.10	0.	P D T HE3	O09
3.40	0.	P D HE3	A10
3.75	0.	P D T HE3	B10
3.75	.15	P D HE3 HE4	C10
4.30	.08	P D HE3	D10
4.30	.15	P D T HE3 HE4	E10
4.30	.30	P D T HE3 HE4	F10
4.35	0.	P D HE3	G10
4.35	.45	P D T HE3 HE4	H10
4.35	.59	P D T HE3	I10
4.70	0.	P D HE3 HE4	J10
5.00	0.	D HE3	K10
5.00	.15	P D T HE3 HE4	L10
5.00	.30	P D T HE3 HE4	M10
5.00	.45	P D T HE3 HE4	N10
5.00	.59	P D T HE3 HE4	O10
5.40	.30	D T HE4	A11
5.55	.22	D T HE4	B11
5.60	.15	D T HE4	C11
5.77	.08	HE4	D11
5.76	.15	D HE4	E11
5.76	.30	D T HE4	F11
5.76	.45	D T HE4	G11
5.76	.59	D T HE4	H11
5.76	.79	D T	I11
5.86	.30	D T HE4	J11
6.20	0.	D HE4	K11
6.25	.15	D HE4	L11
6.25	.30	D T HE4	M11
6.38	.15	D HE4	N11
6.50	0.	D HE4	O11
6.50	.08	D HE4	A12
6.50	.15	D HE4	B12
6.50	.45	D T HE4	C12
6.50	.60	D T HE4	D12
7.20	0.	T	E12
7.20	.08	T	F12
7.75	0.	T HE6	G12
7.75	.15	T HE6	H12
7.75	.30	T HE6	I12
7.75	.60	T	J12
8.65	0.	T HE6	K12
8.65	.30	T HE6	L12
8.65	.60	T	M12
			N12
LEAD			O12
			A13
1.01	0.	P D HE3	B13
2.01	0.	P D T HE3 HE4	C13
2.66	0.	P D HE3 HE4	D13
2.66	.53	P D HE3	E13
2.89	0.	P D	F13
2.89	.08	P D	G13
2.89	.15	P D HE3	H13
2.89	.44	P D T HE3	I13
2.89	.58	P D HE3	J13
3.11	0.	P D HE3	K13
3.41	0.	P HE3 HE4	L13
3.76	0.	P D T HE3	M13
3.76	.15	P D HE3	N13
4.31	.08	P D HE3	O13
4.31	.15	P D T HE3 HE4	A14
4.31	.30	P D T HE3 HE4	B14
4.36	0.	P D HE3	C14
4.36	.45	P D T HE3	D14
4.36	.59	P D T HE3	E14
4.71	0.	P D HE3 HE4	F14
5.01	0.	D HE3	G14
5.01	.15	P D T HE3 HE4	H14
5.01	.30	P D T HE3 HE4	I14
5.01	.45	P D T HE3 HE4	J14
5.01	.59	P D T HE3 HE4	K14
5.41	.30	D T HE4	L14
5.56	.22	D T HE4	M14
5.61	.15	D HE4	N14
5.77	.08	HE4	O14
5.77	.15	D HE4	A15
5.77	.30	D T HE4	B15
5.77	.45	D T HE4	C15
5.77	.59	D T HE4	D15
5.77	.79	D T	E15
5.87	.30	D T HE4	F15
6.21	0.	D HE4	G15
6.26	.15	D HE4	H15
6.26	.30	D T HE4	I15
6.39	.15	D HE4	J15
6.51	0.	D HE4	K15
6.51	.08	D HE4	L15
6.51	.15	D T HE4	M15
6.51	.45	D T HE4	N15
6.51	.60	D T HE4	O15
7.21	0.	T	A16
7.21	.08	T	B16
7.76	0.	T HE6	C16
7.76	.15	T HE6	D16
7.76	.30	T HE6	E16
7.76	.60	T	F16
8.66	0.	T HE6	G16
8.66	.30	T HE6	H16
8.66	.45	T HE6	I16
8.66	.60	T	J16
			K16
'H'			L16
			M16
2.00	0.	P D HE3	N16
2.65	0.	P D	O16
2.88	0.	P	A17
3.10	0.	P	B17
5.00	0.	D	C17
5.00	.30	P D HE3 HE4	D17
5.76	.08	D HE4	E17
5.76	.15	D HE4	F17
6.50	0.	D HE4	G17
6.50	.08	D HE4	H17
6.50	.15	D HE4	I17
7.20	0.	T	J17
7.20	.08	T	K17
7.75	0.	T HE6	L17
7.75	.30	T	M17
8.65	0.	T HE6	N17
8.65	.30	T	O17

FICHE 005 (Negative Pions)

** 1.05 GEV PROTON

CARBON

.25 0.
.38 0. .07
.50 0. .05 .10
.63 0. .07 .14
.75 0. .07 .15
.88 0.
1.00 0.

COPPER

.25 0.
.50 0. .10
.63 0. .07 .14
.75 0. .07 .15
.88 0.
1.00 0.

LEAD

.26 0.
.51 0. .10
.63 0. .07 .14
.76 0. .07 .15
.88 0.
1.01 0.

** 2.10 GEV PROTON

CARBON

.25 0. .05
.50 0. .05 .10
.75 0. .07 .15
1.00 0. .05 .10 .19
1.25 0. .07 .15 .24
1.50 0. .08 .15 .29
1.75 0. .15 .29
2.00 0.

COPPER

.50 0. .10
.75 0. .15
1.00 0. .05 .10 .19
1.25 0. .15
1.50 0. .08 .15 .29
1.75 0. .15

LEAD

.51 0. .10
.76 0. .15
1.01 0. .05 .10 .19
1.26 0. .15
1.51 0. .08 .15 .29
1.76 0. .15

'H'

.50 .10
.75 .15
1.00 0. .10 .19
1.25 0.

** 1.05 GEV/A DEUTERON

CARBON

.25 0. .05
.50 0. .05 .10
.60 0.
.75 0. .05 .10 .15
.90 0.
1.00 0. .05 .10 .15 .19
1.25 0. .05 .15 .24

COPPER

.50 0. .10
.75 0. .05 .15
1.00 0. .19
1.25 0. .05 .24

LEAD

.51 0. .10
.76 0. .05 .15
1.01 0. .19
1.26 0. .05 .24

'H'

.50 0. .10
.75 .05 .15

** 2.10 GEV/A DEUTERON

CARBON

.25 0. .05
.50 0. .10
.75 0. .05 .10 .15
1.00 0. .10 .19
1.35 0. .10 .24
1.65 0.
2.00 0. .10 .25 .39
2.50 0. .25 .48

COPPER

.50 0.
.75 0. .10
1.00 0.
1.35 0.
2.00 0.
2.50 0.

LEAD

.26 0. .05
.51 0. .10
.76 0. .10 .15
1.01 0. .10 .19
1.36 0. .10 .24
1.66 0.
2.01 0. .10 .25 .39
2.51 0. .25 .48

'H'

.75 0.
1.00 0.
1.35 0.

** 1.05 GEV/A ALPHA

CARBON

.25 0. .05
.50 0. .05 .10
.60 0.
.75 0. .05 .10 .15
.90 0.
1.00 0. .05 .10 .15 .19
1.25 0. .05 .15 .24
1.50 0.
1.75 0.

COPPER

.50 0. .10
.75 0. .10
1.00 0. .10 .19
1.25 0. .15

LEAD

.51 0. .10
.76 0. .10
.91 0.
1.01 0. .05 .10 .19
1.26 0. .05 .15 .24

'H'

.75 0. .10
1.00 0.

** 2.10 GEV/A ALPHA

CARBON

.25 0.
.50 0.
.75 0. .07 .15
.90 0.
1.00 0. .07 .15 .22
1.50 0. .15 .29
1.75 0.
2.00 0. .15 .29
2.50 0. .15 .30
3.00 0. .15 .30
3.50 0. .15 .30
4.00 0.

COPPER

.50 0.
.75 0. .15
1.00 0. .07 .15 .22
1.50 0. .29
2.00 0. .29

LEAD

.51 0.
.76 0. .15
1.01 0. .08 .15 .22
1.51 0. .29
2.01 0. .29

'H'

.50 0.
.75 0. .15
1.00 0. .07 .15
1.50 0. .29
2.00 0. .29

** 1.05 GEV/A CARBON

CARBON

.50 0. .07
.75 0. .15
1.00 0. .07 .15
1.25 0.
1.50 0. .08 .15 .22 .29
1.75 0.
2.00 .15 .29

COPPER

.50 0.
1.00 0. .07 .15
1.50 0. .15 .29

LEAD

.51 0.
1.01 0. .08 .15
1.51 0. .15 .29

** 2.10 GEV/A CARBON

CARBON

.50 0.
.75 0. .15
1.00 0. .07 .15
1.50 0.
1.75 0.
2.00 0. .08 .15 .22 .29
2.50 0.
3.00 0. .30 .58
3.50 0.
3.75 0.
4.25 0.

COPPER

.50 0.
1.00 0. .07 .15
2.00 0. .08 .15 .29
3.00 0.

LEAD

.51 0.
1.01 0. .08 .15
2.01 0. .08 .15
3.01 0.

'H'

1.00 0.

FICHE 492 (Fits to the Longitudinal and Transverse Momentum Distributions)

** 1.05 GEV/A DEUTERON A01
C P D B01
CU P D C01
PB P D D01
'H' P D E01
F01
** 2.1 GEV/A DEUTERON G01
C P D H01
CU P D I01
PB P D J01
'H' P D K01
L01
** 0.4 GEV/A ALPHA M01
C P D T HE3 HE4 N01
CU P D T HE4 O01
PB P D T HE4 A02
PB P D T HE4 B02
C02
** 1.05 GEV/A ALPHA D02
C P D T HE3 HE4 E02
CU P D T HE3 HE4 F02
PB P D T HE3 HE4 G02
'H' P D T HE3 HE4 H02
I02
** 2.1 GEV/A ALPHA J02
C P D T HE3 HE4 K02
CU P D T HE3 HE4 L02
PB P D T HE3 HE4 M02
'H' P D T HE3 HE4 N02
O02
** 1.05 GEV/A CARBON A03
C P D T HE3 HE4 HE6 HE8 B03
CU P D T HE3 HE4 HE6 HE8 C03
PB P D T HE3 HE4 HE6 HE8 D03
'H' P D T HE3 HE4 HE6 E03
F03
G03
H03
I03
J03
K03
L03
M03
N03
O03
A04
B04
C04
D04
E04
F04
G04
H04
I04
J04
K04
L04
M04
N04
O04
A05
B05
C05
D05
E05
F05
G05
H05

** 2.1 GEV/A CARBON I05
J05
C P D T HE3 HE4 HE6 K05
L05
CU P D T HE3 HE4 HE6 M05
N05
PB P D T HE3 HE4 HE6 O05
A06
'H' P D T HE4 HE6 B06
C06

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