all recoil nuclei in the GNASH calculations (Ch96b). The recoil energy distributions are represented in the laboratory system in MT=5, MF=6, and are given as isotropic in the lab system. Note that all other data in MT=5,MF=6 are given in the center-of-mass system. This method of representation requires a modification of the original ENDF-6 format.

Preequilibrium corrections were performed in the course of the GNASH calculations using the exciton model of Kalbach (Ka77, Ka85), validated by comparison with calculations using Feshbach, Kerman, Koonin (FKK) theory [Ch93]. Discrete level data from nuclear data sheets were matched to continuum level densities using the formulation of Ignatyuk (Ig75) and pairing and shell parameters from the Cook (Co67) analysis. Neutron and charged-particle transmission coefficients were obtained from the optical potentials, as discussed below. Gamma-ray transmission coefficients were calculated using the Kopecky-Uhl model (Ko90).

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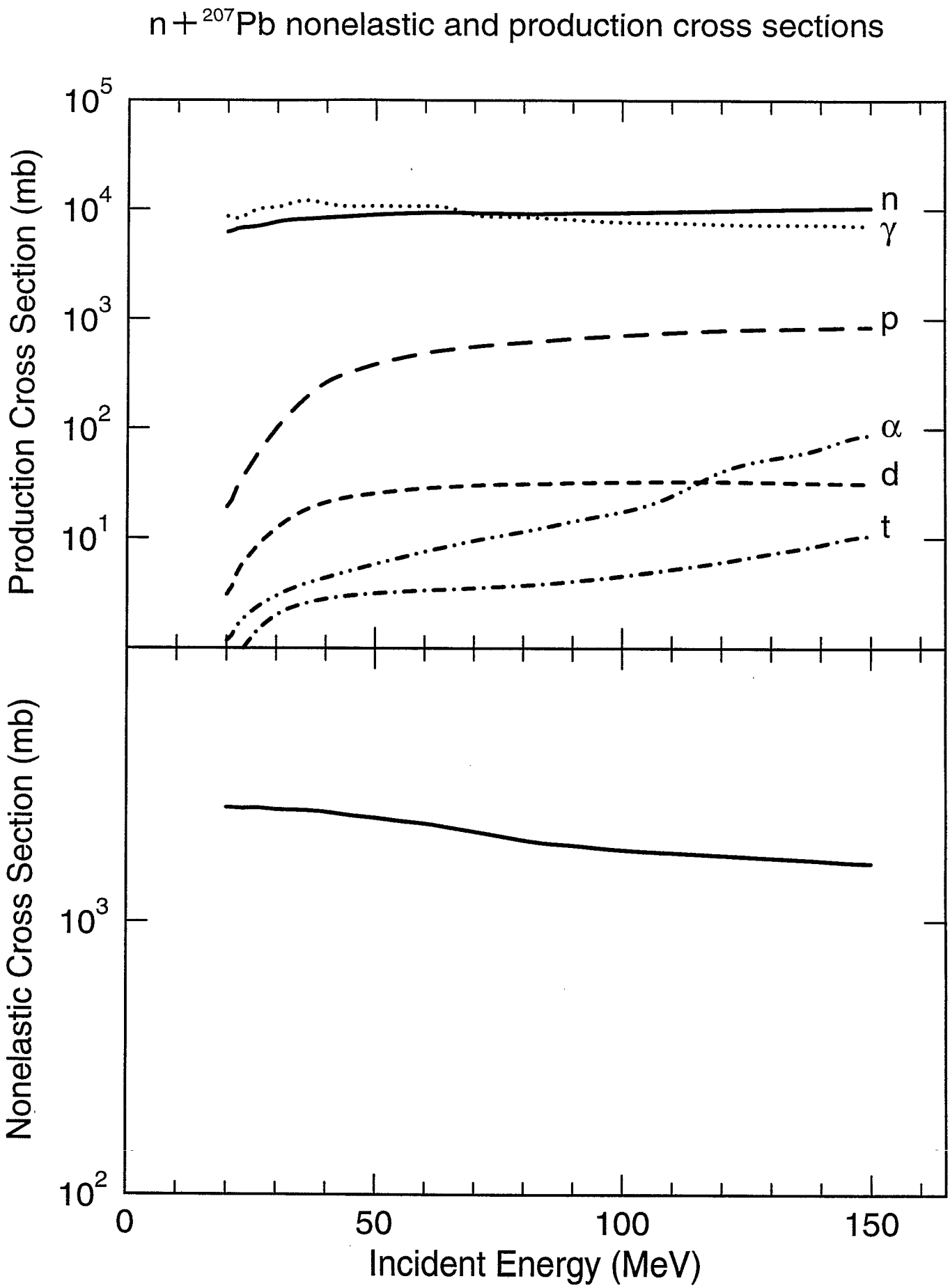
82207 = TARGET 1000Z+A (if A=0 then elemental)
1 = PROJECTILE 1000Z+A
Nonelastic, elastic, and Production cross sections for A<5 ejectiles in barns:

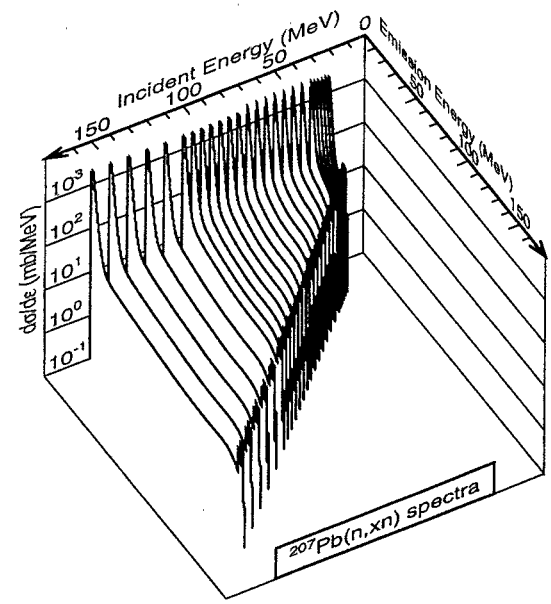
| Energy | nonelas | elastic | neutron | proton | deuteron | triton | helium3 | alpha | gamma |
|---|---|---|---|---|---|---|---|---|---|
| 2.000E+01 | 2.604E+00 | 3.240E+00 | 6.203E+00 | 1.925E-02 | 3.060E-03 | 4.317E-04 | 0.000E+00 | 1.164E-03 | 8.590E+00 |
| 2.200E+01 | 2.591E+00 | 3.214E+00 | 6.639E+00 | 2.860E-02 | 4.715E-03 | 7.470E-04 | 0.000E+00 | 1.570E-03 | 8.219E+00 |
| 2.400E+01 | 2.586E+00 | 3.106E+00 | 6.816E+00 | 4.072E-02 | 6.482E-03 | 1.085E-03 | 0.000E+00 | 1.960E-03 | 9.005E+00 |
| 2.600E+01 | 2.594E+00 | 2.937E+00 | 6.994E+00 | 5.669E-02 | 8.356E-03 | 1.414E-03 | 0.000E+00 | 2.330E-03 | 9.949E+00 |
| 2.800E+01 | 2.577E+00 | 2.760E+00 | 7.289E+00 | 7.641E-02 | 1.028E-02 | 1.712E-03 | 0.000E+00 | 2.663E-03 | 1.031E+01 |
| 3.000E+01 | 2.558E+00 | 2.569E+00 | 7.679E+00 | 9.991E-02 | 1.231E-02 | 1.989E-03 | 0.000E+00 | 2.983E-03 | 1.047E+01 |
| 3.500E+01 | 2.541E+00 | 2.109E+00 | 8.122E+00 | 1.742E-01 | 1.730E-02 | 2.488E-03 | 0.000E+00 | 3.726E-03 | 1.194E+01 |
| 4.000E+01 | 2.502E+00 | 1.858E+00 | 8.385E+00 | 2.627E-01 | 2.117E-02 | 2.804E-03 | 0.000E+00 | 4.369E-03 | 1.121E+01 |
| 4.500E+01 | 2.433E+00 | 1.821E+00 | 8.641E+00 | 3.265E-01 | 2.380E-02 | 3.005E-03 | 0.000E+00 | 5.040E-03 | 1.060E+01 |
| 5.000E+01 | 2.383E+00 | 1.907E+00 | 8.936E+00 | 3.860E-01 | 2.557E-02 | 3.143E-03 | 0.000E+00 | 5.808E-03 | 1.073E+01 |
| 5.500E+01 | 2.323E+00 | 2.074E+00 | 9.155E+00 | 4.381E-01 | 2.718E-02 | 3.246E-03 | 0.000E+00 | 6.633E-03 | 1.067E+01 |
| 6.000E+01 | 2.274E+00 | 2.208E+00 | 9.320E+00 | 4.874E-01 | 2.858E-02 | 3.339E-03 | 0.000E+00 | 7.563E-03 | 1.072E+01 |
| 6.500E+01 | 2.200E+00 | 2.402E+00 | 9.371E+00 | 5.263E-01 | 2.950E-02 | 3.413E-03 | 0.000E+00 | 8.489E-03 | 1.029E+01 |
| 7.000E+01 | 2.125E+00 | 2.573E+00 | 9.259E+00 | 5.593E-01 | 3.035E-02 | 3.506E-03 | 0.000E+00 | 9.505E-03 | 8.893E+00 |
| 7.500E+01 | 2.050E+00 | 2.700E+00 | 9.193E+00 | 5.881E-01 | 3.098E-02 | 3.612E-03 | 0.000E+00 | 1.048E-02 | 8.602E+00 |
| 8.000E+01 | 1.976E+00 | 2.830E+00 | 9.132E+00 | 6.118E-01 | 3.131E-02 | 3.714E-03 | 0.000E+00 | 1.154E-02 | 8.518E+00 |
| 8.500E+01 | 1.923E+00 | 2.883E+00 | 9.155E+00 | 6.372E-01 | 3.165E-02 | 3.850E-03 | 0.000E+00 | 1.279E-02 | 8.303E+00 |
| 9.000E+01 | 1.893E+00 | 2.853E+00 | 9.270E+00 | 6.666E-01 | 3.220E-02 | 4.056E-03 | 0.000E+00 | 1.430E-02 | 8.098E+00 |
| 9.500E+01 | 1.855E+00 | 2.808E+00 | 9.321E+00 | 6.898E-01 | 3.250E-02 | 4.276E-03 | 0.000E+00 | 1.584E-02 | 7.846E+00 |
| 1.000E+02 | 1.822E+00 | 2.768E+00 | 9.383E+00 | 7.117E-01 | 3.273E-02 | 4.540E-03 | 0.000E+00 | 1.754E-02 | 7.676E+00 |
| 1.100E+02 | 1.780E+00 | 2.594E+00 | 9.592E+00 | 7.573E-01 | 3.315E-02 | 5.211E-03 | 0.000E+00 | 2.448E-02 | 7.594E+00 |
| 1.200E+02 | 1.742E+00 | 2.416E+00 | 9.794E+00 | 7.938E-01 | 3.308E-02 | 6.080E-03 | 0.000E+00 | 4.083E-02 | 7.370E+00 |
| 1.300E+02 | 1.704E+00 | 2.249E+00 | 1.003E+01 | 8.150E-01 | 3.266E-02 | 7.334E-03 | 0.000E+00 | 5.366E-02 | 7.267E+00 |
| 1.400E+02 | 1.666E+00 | 2.072E+00 | 1.022E+01 | 8.324E-01 | 3.215E-02 | 8.812E-03 | 0.000E+00 | 6.670E-02 | 7.277E+00 |
| 1.500E+02 | 1.630E+00 | 1.928E+00 | 1.038E+01 | 8.479E-01 | 3.167E-02 | 1.050E-02 | 0.000E+00 | 8.775E-02 | 7.123E+00 |

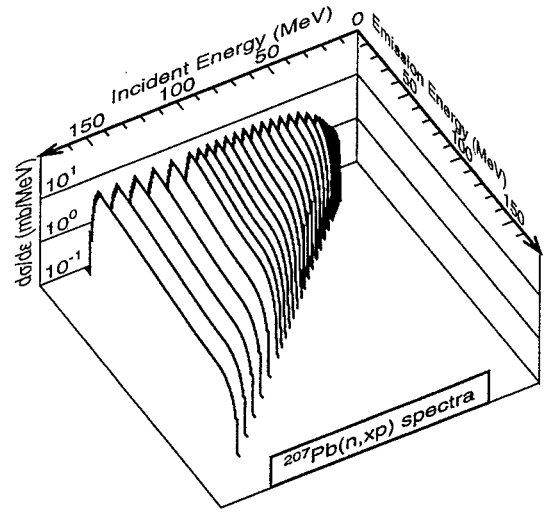
82207 = TARGET 1000Z+A (if A=0 then elemental)
1 = PROJECTILE 1000Z+A
Kerma coefficients in units of f.Gy.m^2:

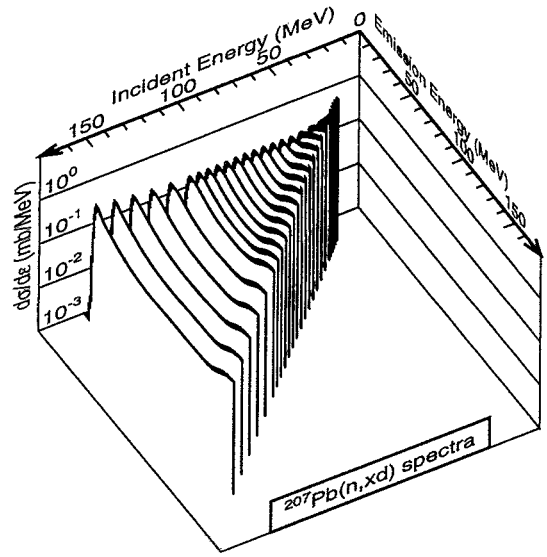
| Energy | proton | deuteron | triton | helium3 | alpha | non-rec | elas-rec | TOTAL |
|---|---|---|---|---|---|---|---|---|
| 2.000E+01 | 1.207E-02 | 1.834E-03 | 2.296E-04 | 0.000E+00 | 1.193E-03 | 1.427E-02 | 2.705E-03 | 3.230E-02 |
| 2.200E+01 | 1.919E-02 | 3.122E-03 | 4.352E-04 | 0.000E+00 | 1.679E-03 | 1.560E-02 | 2.273E-03 | 4.230E-02 |
| 2.400E+01 | 2.893E-02 | 4.684E-03 | 6.848E-04 | 0.000E+00 | 2.178E-03 | 1.689E-02 | 2.283E-03 | 5.565E-02 |
| 2.600E+01 | 4.234E-02 | 6.528E-03 | 9.595E-04 | 0.000E+00 | 2.680E-03 | 1.815E-02 | 2.308E-03 | 7.297E-02 |
| 2.800E+01 | 5.979E-02 | 8.622E-03 | 1.241E-03 | 0.000E+00 | 3.160E-03 | 1.920E-02 | 2.345E-03 | 9.436E-02 |
| 3.000E+01 | 8.179E-02 | 1.102E-02 | 1.533E-03 | 0.000E+00 | 3.641E-03 | 2.023E-02 | 2.369E-03 | 1.206E-01 |
| 3.500E+01 | 1.590E-01 | 1.795E-02 | 2.178E-03 | 0.000E+00 | 4.831E-03 | 2.268E-02 | 2.338E-03 | 2.090E-01 |
| 4.000E+01 | 2.658E-01 | 2.477E-02 | 2.736E-03 | 0.000E+00 | 5.941E-03 | 2.470E-02 | 2.279E-03 | 3.262E-01 |
| 4.500E+01 | 3.611E-01 | 3.128E-02 | 3.225E-03 | 0.000E+00 | 7.055E-03 | 2.622E-02 | 2.513E-03 | 4.314E-01 |
| 5.000E+01 | 4.609E-01 | 3.689E-02 | 3.662E-03 | 0.000E+00 | 8.260E-03 | 2.775E-02 | 2.697E-03 | 5.402E-01 |
| 5.500E+01 | 5.594E-01 | 4.275E-02 | 4.054E-03 | 0.000E+00 | 9.498E-03 | 2.885E-02 | 2.823E-03 | 6.474E-01 |
| 6.000E+01 | 6.607E-01 | 4.850E-02 | 4.417E-03 | 0.000E+00 | 1.083E-02 | 2.984E-02 | 2.801E-03 | 7.571E-01 |
| 6.500E+01 | 7.533E-01 | 5.362E-02 | 4.732E-03 | 0.000E+00 | 1.209E-02 | 3.024E-02 | 2.790E-03 | 8.567E-01 |
| 7.000E+01 | 8.424E-01 | 5.887E-02 | 5.043E-03 | 0.000E+00 | 1.340E-02 | 3.061E-02 | 2.591E-03 | 9.529E-01 |
| 7.500E+01 | 9.298E-01 | 6.370E-02 | 5.353E-03 | 0.000E+00 | 1.461E-02 | 3.052E-02 | 2.383E-03 | 1.046E+00 |
| 8.000E+01 | 1.013E+00 | 6.798E-02 | 5.608E-03 | 0.000E+00 | 1.584E-02 | 3.036E-02 | 2.235E-03 | 1.135E+00 |
| 8.500E+01 | 1.104E+00 | 7.226E-02 | 5.854E-03 | 0.000E+00 | 1.725E-02 | 3.038E-02 | 2.076E-03 | 1.232E+00 |
| 9.000E+01 | 1.205E+00 | 7.702E-02 | 6.151E-03 | 0.000E+00 | 1.893E-02 | 3.063E-02 | 1.903E-03 | 1.340E+00 |
| 9.500E+01 | 1.300E+00 | 8.118E-02 | 6.416E-03 | 0.000E+00 | 2.059E-02 | 3.068E-02 | 1.758E-03 | 1.441E+00 |
| 1.000E+02 | 1.396E+00 | 8.515E-02 | 6.687E-03 | 0.000E+00 | 2.239E-02 | 3.073E-02 | 1.646E-03 | 1.543E+00 |
| 1.100E+02 | 1.603E+00 | 9.262E-02 | 7.256E-03 | 0.000E+00 | 2.733E-02 | 3.096E-02 | 1.462E-03 | 1.763E+00 |
| 1.200E+02 | 1.803E+00 | 9.807E-02 | 7.825E-03 | 0.000E+00 | 3.536E-02 | 3.113E-02 | 1.319E-03 | 1.977E+00 |
| 1.300E+02 | 1.976E+00 | 1.016E-01 | 8.543E-03 | 0.000E+00 | 4.348E-02 | 3.227E-02 | 1.211E-03 | 2.164E+00 |
| 1.400E+02 | 2.143E+00 | 1.041E-01 | 9.354E-03 | 0.000E+00 | 5.251E-02 | 3.397E-02 | 1.114E-03 | 2.344E+00 |
| 1.500E+02 | 2.306E+00 | 1.060E-01 | 1.028E-02 | 0.000E+00 | 6.460E-02 | 3.563E-02 | 1.045E-03 | 2.524E+00 |

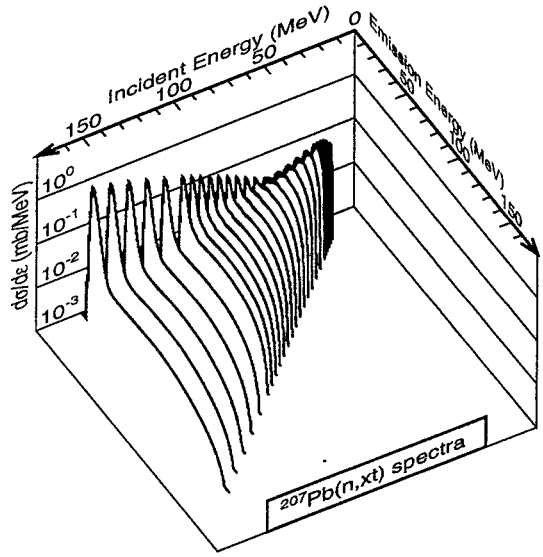

n + 207Pb nonelastic and production cross sections
Production Cross Section (mb)
10^5
10^4
10^3
10^2
10^1
n
γ
p
α
d
t
Nonelastic Cross Section (mb)
10^3
10^2
0
50
100
150
Incident Energy (MeV)

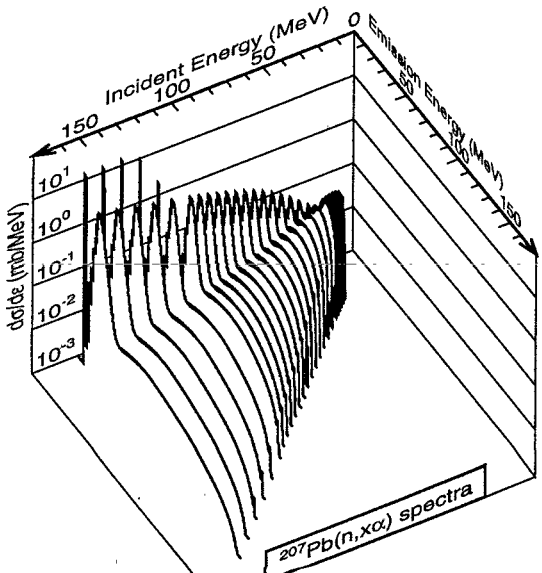
# n + $^{207}$Pb angle-integrated emission spectra

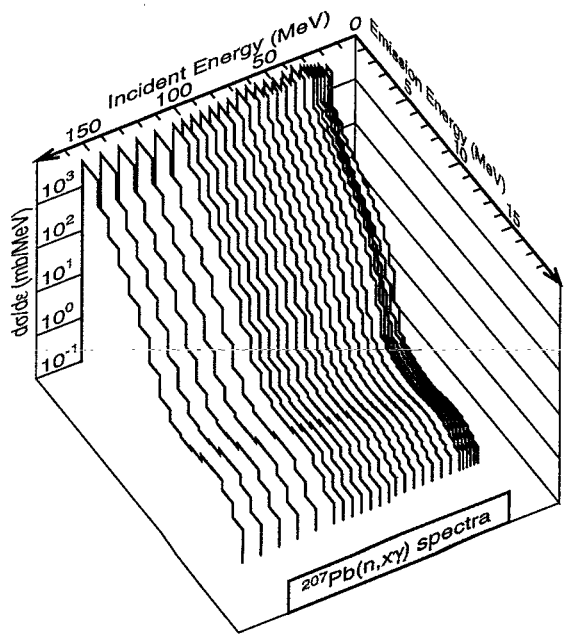


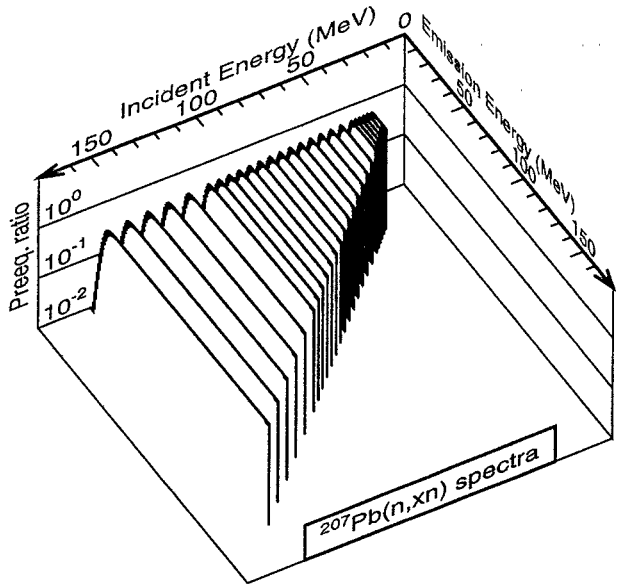



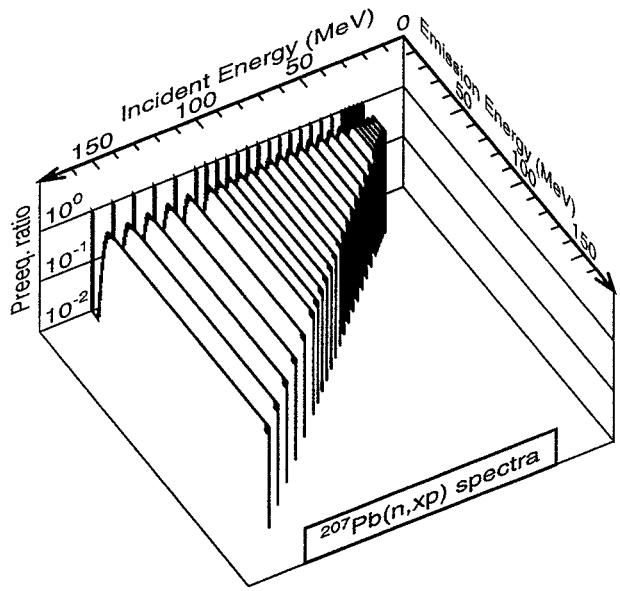



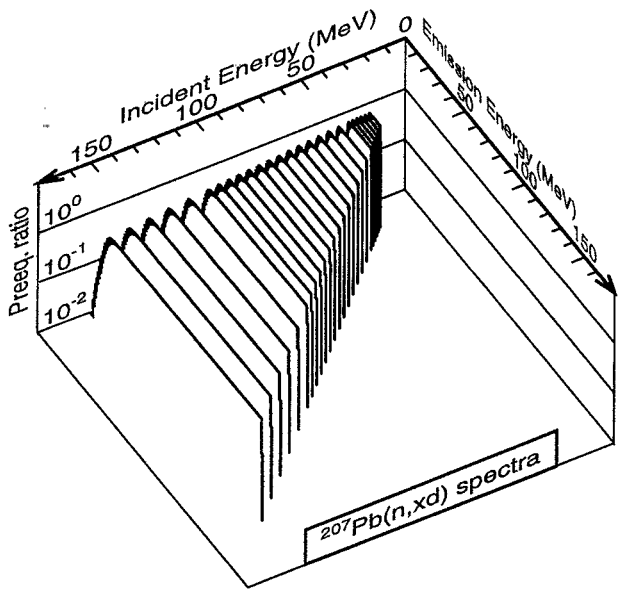



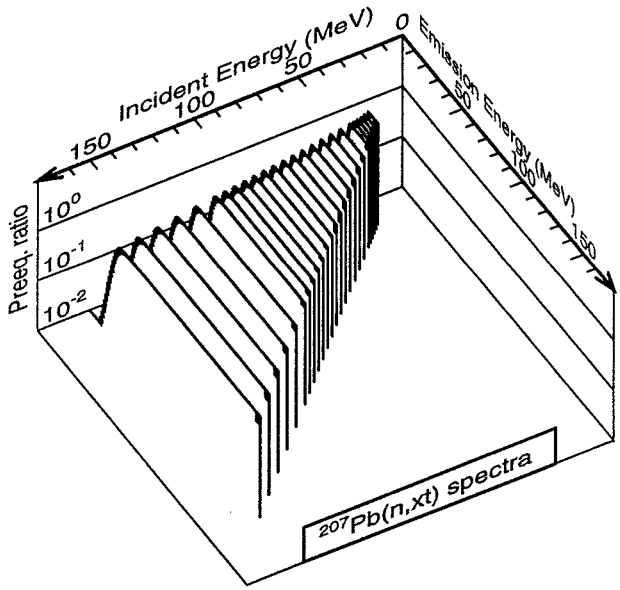



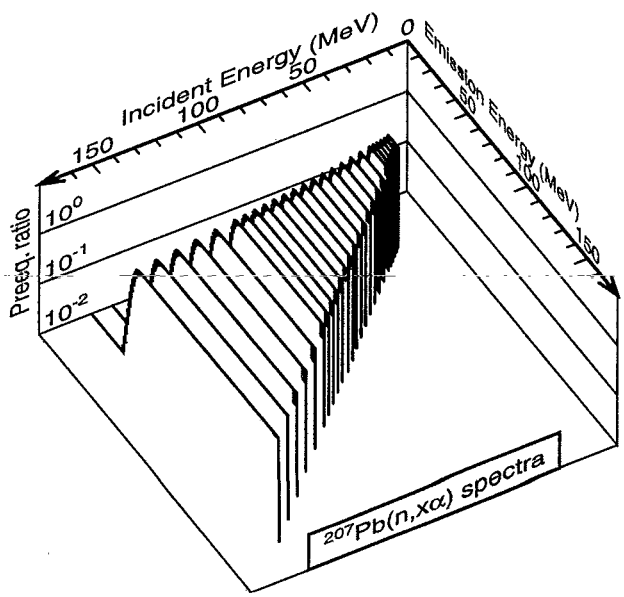
# n + $^{207}$Pb Kalbach preequilibrium ratios

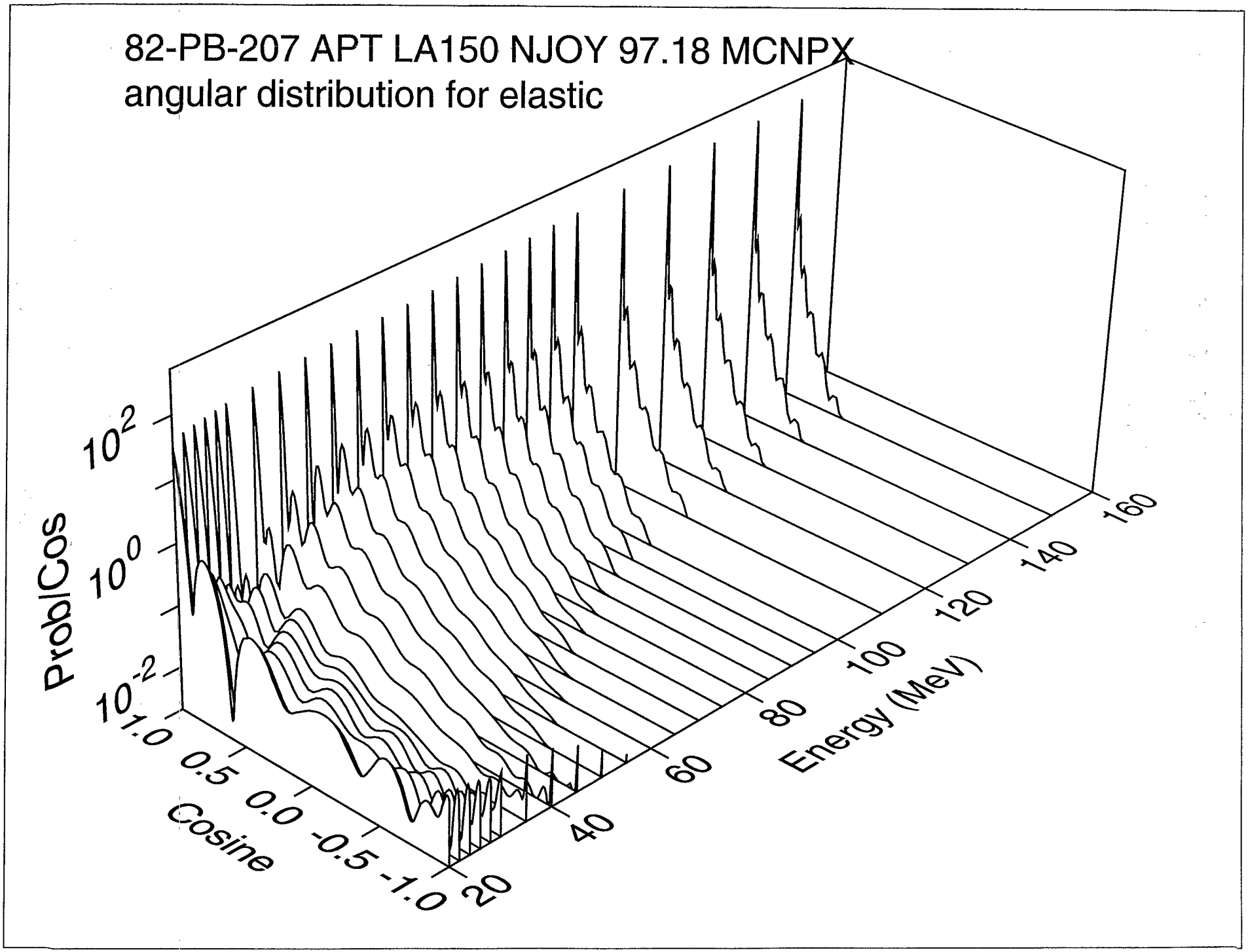


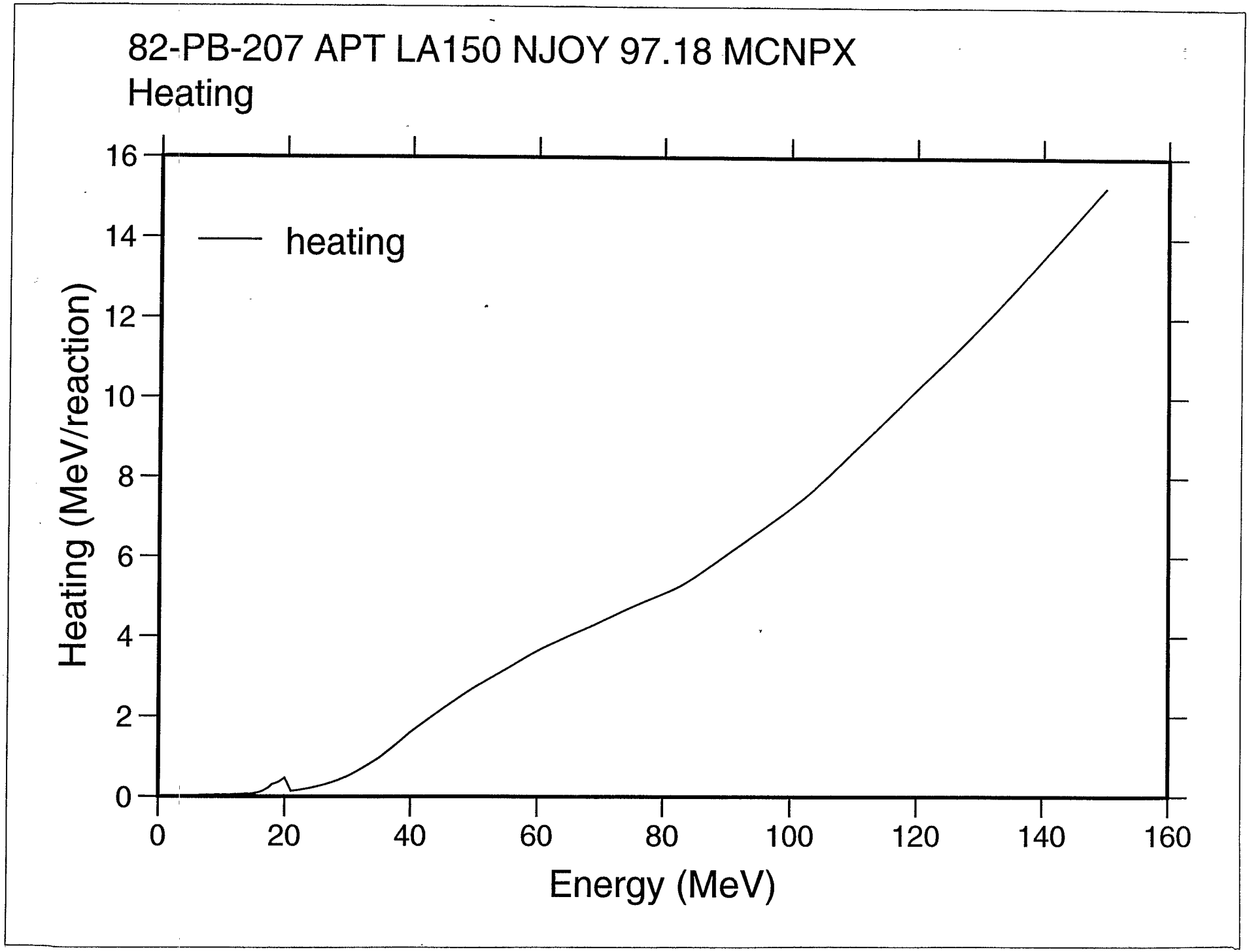



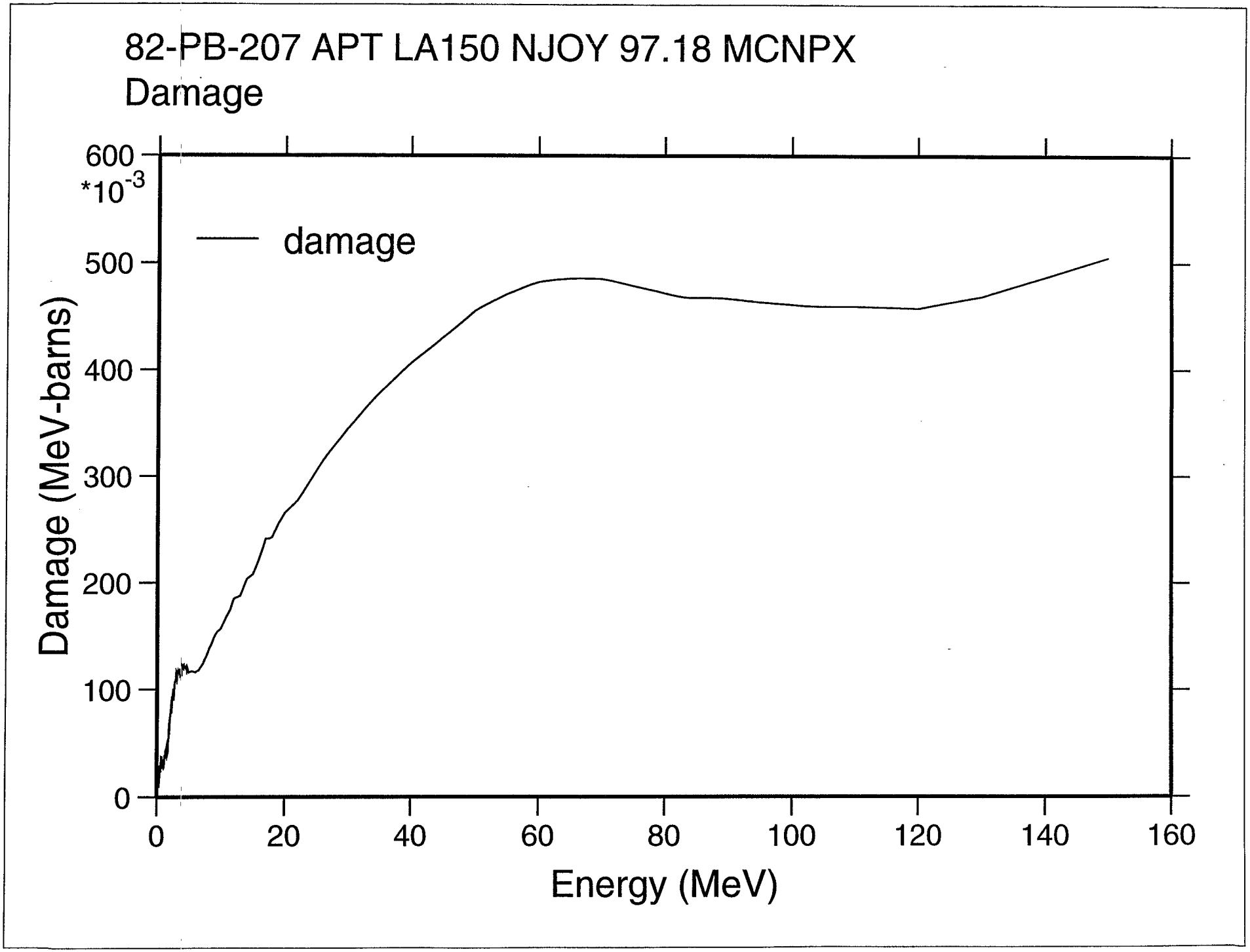




82-PB-207 APT LA150 NJOY 97.18 MCNPX
angular distribution for elastic
Prob/Cos
$10^2$
$10^0$
$10^{-2}$
Cosine
1.0
0.5
0.0
-0.5
-1.0
Energy (MeV)
20
40
60
80
100
120
140
160


82-PB-207 APT LA150 NJOY 97.18 MCNPX
Heating
heating
Heating (MeV/reaction)
Energy (MeV)
0
2
4
6
8
10
12
14
16
0
20
40
60
80
100
120
140
160


82-PB-207 APT LA150 NJOY 97.18 MCNPX
Damage
damage
Damage (MeV-barns)
*10^-3
600
500
400
300
200
100
0
0
20
40
60
80
100
120
140
160
Energy (MeV)