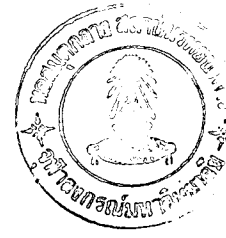




ภาคผนวก

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย



- A Neutron flux density จากการคำนวณของชุดที่ 1 ร่วมกับ cross-section จาก DETAN74
- B Neutron flux density จากการคำนวณของชุดที่ 1 ร่วมกับ cross-section จาก DETAN74
- C Neutron flux density จากการคำนวณของชุดที่ 1 ร่วมกับ cross-section จาก IRDF82
- D Neutron flux density จากการคำนวณของชุดที่ 2 ร่วมกับ cross-section จาก DETAN74
- E Neutron flux density จากการคำนวณของชุดที่ 3 ร่วมกับ cross-section จาก DETAN74

Energy (MeV)	A	B	C	D	E	Energy (MeV)	A	B	C	D	E
1.000E-10	3.305E+18	2.930E+18	2.775E+18	2.994E+18	3.058E+18	6.600E-09	1.669E+20	1.470E+20	1.308E+20	1.513E+20	1.545E+20
1.050E-10	3.466E+18	3.072E+18	2.910E+18	3.139E+18	3.207E+18	6.900E-09	1.722E+20	1.517E+20	1.350E+20	1.561E+20	1.595E+20
1.100E-10	3.627E+18	3.214E+18	3.044E+18	3.285E+18	3.356E+18	7.200E-09	1.783E+20	1.571E+20	1.397E+20	1.616E+20	1.651E+20
1.150E-10	3.787E+18	3.356E+18	3.179E+18	3.430E+18	3.504E+18	7.600E-09	1.849E+20	1.629E+20	1.449E+20	1.676E+20	1.712E+20
1.200E-10	3.987E+18	3.511E+18	3.123E+18	3.611E+18	3.689E+18	8.000E-09	1.912E+20	1.686E+20	1.500E+20	1.734E+20	1.772E+20
1.275E-10	4.228E+18	3.723E+18	3.312E+18	3.829E+18	3.912E+18	8.400E-09	1.974E+20	1.740E+20	1.548E+20	1.790E+20	1.829E+20
1.350E-10	4.468E+18	3.934E+18	3.500E+18	4.046E+18	4.134E+18	8.800E-09	2.032E+20	1.792E+20	1.594E+20	1.844E+20	1.884E+20
1.425E-10	4.708E+18	4.146E+18	3.688E+18	4.264E+18	4.356E+18	9.200E-09	2.088E+20	1.842E+20	1.639E+20	1.896E+20	1.937E+20
1.500E-10	4.988E+18	4.392E+18	3.907E+18	4.517E+18	4.615E+18	9.600E-09	2.142E+20	1.890E+20	1.682E+20	1.945E+20	1.988E+20
1.600E-10	5.309E+18	4.674E+18	4.158E+18	4.808E+18	4.912E+18	1.000E-08	2.200E+20	1.942E+20	1.728E+20	1.999E+20	2.042E+20
1.700E-10	5.627E+18	4.955E+18	4.408E+18	5.096E+18	5.207E+18	1.050E-08	2.263E+20	1.996E+20	1.776E+20	2.055E+20	2.099E+20
1.800E-10	5.946E+18	5.236E+18	4.658E+18	5.385E+18	5.502E+18	1.100E-08	2.322E+20	2.048E+20	1.822E+20	2.108E+20	2.153E+20
1.900E-10	6.266E+18	5.517E+18	4.908E+18	5.675E+18	5.798E+18	1.150E-08	2.378E+20	2.097E+20	1.865E+20	2.158E+20	2.204E+20
2.000E-10	6.582E+18	5.796E+18	5.156E+18	5.961E+18	6.091E+18	1.200E-08	2.442E+20	2.154E+20	1.916E+20	2.217E+20	2.264E+20
2.100E-10	6.902E+18	6.077E+18	5.406E+18	6.250E+18	6.386E+18	1.275E-08	2.514E+20	2.217E+20	1.972E+20	2.282E+20	2.331E+20
2.200E-10	7.221E+18	6.358E+18	5.656E+18	6.540E+18	6.681E+18	1.350E-08	2.579E+20	2.275E+20	2.024E+20	2.342E+20	2.391E+20
2.300E-10	7.537E+18	6.637E+18	5.904E+18	6.826E+18	6.974E+18	1.425E-08	2.637E+20	2.327E+20	2.070E+20	2.396E+20	2.447E+20
2.400E-10	7.936E+18	6.988E+18	6.217E+18	7.187E+18	7.343E+18	1.500E-08	2.696E+20	2.381E+20	2.119E+20	2.453E+20	2.505E+20
2.500E-10	8.414E+18	7.408E+18	6.591E+18	7.620E+18	7.785E+18	1.600E-08	2.754E+20	2.436E+20	2.167E+20	2.510E+20	2.563E+20
2.700E-10	8.809E+18	7.757E+18	6.901E+18	7.978E+18	8.151E+18	1.700E-08	2.801E+20	2.482E+20	2.209E+20	2.559E+20	2.613E+20
2.800E-10	9.284E+18	8.175E+18	7.273E+18	8.408E+18	8.590E+18	1.800E-08	2.839E+20	2.522E+20	2.244E+20	2.601E+20	2.656E+20
3.000E-10	9.915E+18	8.730E+18	7.767E+18	8.979E+18	9.174E+18	1.900E-08	2.867E+20	2.554E+20	2.273E+20	2.636E+20	2.692E+20
3.200E-10	1.054E+19	9.285E+18	8.260E+18	9.550E+18	9.757E+18	2.000E-08	2.890E+20	2.580E+20	2.296E+20	2.664E+20	2.721E+20
3.400E-10	1.118E+19	9.840E+18	8.754E+18	1.012E+19	1.034E+19	2.100E-08	2.912E+20	2.600E+20	2.314E+20	2.685E+20	2.743E+20
3.600E-10	1.181E+19	1.040E+19	9.248E+18	1.069E+19	1.092E+19	2.200E-08	2.927E+20	2.615E+20	2.327E+20	2.701E+20	2.758E+20
3.800E-10	1.244E+19	1.095E+19	9.741E+18	1.126E+19	1.151E+19	2.300E-08	2.935E+20	2.625E+20	2.335E+20	2.712E+20	2.769E+20
4.000E-10	1.314E+19	1.157E+19	1.029E+19	1.190E+19	1.216E+19	2.400E-08	2.938E+20	2.629E+20	2.339E+20	2.717E+20	2.775E+20
4.250E-10	1.392E+19	1.226E+19	1.090E+19	1.261E+19	1.288E+19	2.550E-08	2.930E+20	2.627E+20	2.337E+20	2.716E+20	2.773E+20
4.500E-10	1.470E+19	1.294E+19	1.152E+19	1.331E+19	1.360E+19	2.700E-08	2.915E+20	2.619E+20	2.330E+20	2.709E+20	2.767E+20
4.750E-10	1.548E+19	1.363E+19	1.213E+19	1.402E+19	1.432E+19	2.800E-08	2.888E+20	2.600E+20	2.313E+20	2.691E+20	2.749E+20
5.000E-10	1.626E+19	1.432E+19	1.274E+19	1.473E+19	1.504E+19	3.000E-08	2.841E+20	2.567E+20	2.284E+20	2.659E+20	2.716E+20
5.250E-10	1.703E+19	1.500E+19	1.334E+19	1.543E+19	1.576E+19	3.200E-08	2.792E+20	2.523E+20	2.245E+20	2.613E+20	2.669E+20
5.500E-10	1.781E+19	1.568E+19	1.395E+19	1.613E+19	1.648E+19	3.400E-08	2.733E+20	2.471E+20	2.198E+20	2.560E+20	2.614E+20
5.750E-10	1.858E+19	1.636E+19	1.456E+19	1.683E+19	1.720E+19	3.600E-08	2.666E+20	2.412E+20	2.146E+20	2.499E+20	2.532E+20
6.000E-10	1.943E+19	1.711E+19	1.522E+19	1.760E+19	1.798E+19	3.800E-08	2.592E+20	2.347E+20	2.089E+20	2.433E+20	2.485E+20
6.300E-10	2.036E+19	1.792E+19	1.595E+19	1.844E+19	1.883E+19	4.000E-08	2.505E+20	2.269E+20	2.019E+20	2.352E+20	2.403E+20
6.600E-10	2.138E+19	1.874E+19	1.667E+19	1.969E+19	1.969E+19	4.250E-08	2.405E+20	2.179E+20	1.939E+20	2.258E+20	2.307E+20
6.900E-10	2.220E+19	1.955E+19	1.739E+19	2.010E+19	2.034E+19	4.500E-08	2.301E+20	2.085E+20	1.855E+20	2.161E+20	2.208E+20
7.200E-10	2.327E+19	2.049E+19	1.822E+19	2.107E+19	2.153E+19	4.750E-08	2.194E+20	1.989E+20	1.770E+20	2.062E+20	2.107E+20
7.600E-10	2.448E+19	2.156E+19	1.918E+19	2.217E+19	2.265E+19	5.000E-08	2.087E+20	1.893E+20	1.684E+20	1.962E+20	2.005E+20
8.000E-10	2.570E+19	2.263E+19	2.013E+19	2.327E+19	2.378E+19	5.250E-08	1.981E+20	1.797E+20	1.599E+20	1.863E+20	1.903E+20
8.400E-10	2.691E+19	2.369E+19	2.108E+19	2.437E+19	2.490E+19	5.500E-08	1.877E+20	1.702E+20	1.515E+20	1.764E+20	1.803E+20
8.800E-10	2.812E+19	2.476E+19	2.202E+19	2.546E+19	2.602E+19	5.750E-08	1.774E+20	1.609E+20	1.432E+20	1.668E+20	1.705E+20
9.200E-10	2.932E+19	2.582E+19	2.297E+19	2.655E+19	2.713E+19	6.000E-08	1.665E+20	1.510E+20	1.343E+20	1.564E+20	1.599E+20
9.600E-10	3.052E+19	2.687E+19	2.391E+19	2.764E+19	2.824E+19	6.300E-08	1.554E+20	1.405E+20	1.250E+20	1.455E+20	1.486E+20
1.000E-09	3.186E+19	2.805E+19	2.496E+19	2.886E+19	2.948E+19	6.600E-08	1.447E+20	1.304E+20	1.161E+20	1.350E+20	1.379E+20
1.050E-09	3.335E+19	2.936E+19	2.612E+19	3.020E+19	3.086E+19	6.900E-08	1.345E+20	1.209E+20	1.075E+20	1.250E+20	1.277E+20
1.100E-09	3.483E+19	3.067E+19	2.728E+19	3.154E+19	3.223E+19	7.200E-08	1.231E+20	1.103E+20	9.817E+19	1.140E+20	1.165E+20
1.150E-09	3.631E+19	3.197E+19	2.844E+19	3.288E+19	3.359E+19	7.600E-08	1.110E+20	9.917E+19	8.824E+19	1.024E+20	1.046E+20
1.200E-09	3.814E+19	3.358E+19	2.988E+19	3.454E+19	3.529E+19	8.000E-08	9.978E+19	8.890E+19	7.912E+19	9.172E+19	9.370E+19
1.275E-09	4.033E+19	3.551E+19	3.159E+19	3.653E+19	3.732E+19	8.400E-08	8.953E+19	7.949E+19	7.073E+19	8.195E+19	8.371E+19
1.350E-09	4.251E+19	3.743E+19	3.330E+19	3.850E+19	3.933E+19	8.800E-08	8.005E+19	7.092E+19	6.311E+19	7.308E+19	7.465E+19
1.425E-09	4.467E+19	3.934E+19	3.499E+19	4.046E+19	4.134E+19	9.200E-08	7.143E+19	6.317E+19	5.621E+19	6.506E+19	6.646E+19
1.500E-09	4.718E+19	4.155E+19	3.696E+19	4.273E+19	4.366E+19	9.600E-08	6.355E+19	5.616E+19	4.998E+19	5.782E+19	5.907E+19
1.600E-09	5.003E+19	4.405E+19	3.919E+19	4.531E+19	4.629E+19	1.000E-07	5.567E+19	4.909E+19	4.368E+19	5.052E+19	5.160E+19
1.700E-09	5.285E+19	4.653E+19	4.140E+19	4.786E+19	4.890E+19	1.050E-07	4.803E+19	4.218E+19	3.753E+19	4.337E+19	4.429E+19
1.800E-09	5.564E+19	4.899E+19	4.359E+19	5.039E+19	5.148E+19	1.100E-07	4.127E+19	3.616E+19	3.218E+19	3.717E+19	3.795E+19
1.900E-09	5.843E+19	5.145E+19	4.577E+19	5.292E+19	5.406E+19	1.150E-07	3.539E+19	3.094E+19	2.754E+19	3.180E+19	3.246E+19
2.000E-09	6.119E+19	5.387E+19	4.793E+19	5.541E+19	5.661E+19	1.200E-07	2.909E+19	2.541E+19	2.262E+19	2.611E+19	2.665E+19
2.100E-09	6.391E+19	5.628E+19	5.007E+19	5.788E+19	5.914E+19	1.275E-07	2.289E+19	1.999E+19	1.779E+19	2.054E+19	2.097E+19
2.200E-09	6.662E+19	5.866E+19	5.218E+19	6.033E+19	6.164E+19	1.350E-07	1.852E+19	1.617E+19	1.439E+19	1.661E+19	1.696E+19
2.300E-09	6.939E+19	6.101E+19	5.428E+19	6.275E+19	6.411E+19	1.425E-07	1.647E+19	1.439E+19	1.281E+19	1.478E+19	1.509E+19
2.400E-09	7.262E+19	6.394E+19	5.689E+19	6.577E+19	6.719E+19	1.500E-07	1.553E+19	1.358E+19	1.208E+19	1.395E+19	1.424E+19
2.500E-09	7.655E+19	6.740E+19	5.997E+19	6.933E+19	7.083E+19	1.600E-07	1.454E+19	1.273E+19	1.133E+19	1.308E+19	1.335E+19
2.700E-09	7.980E+19	7.026E+19	6.251E+19	7.227E+19	7.383E+19	1.700E-07	1.373E+19	1.204E+19	1.071E+19	1.237E+19	1.263E+19
2.800E-09	8.365E+19	7.355E+19	6.552E+19	7.576E+19	7.740E+19	1.800E-07	1.295E+19	1.137E+19	1.012E+19	1.170E+19	1.195E+19
3.000E-09	8.870E+19	7.810E+19	6.948E+19	8.033E+19	8.207E+19	1.900E-07	1.226E+19	1.079E+19	9.606E+18	1.110E+19	1.134E+19
3.200E-09	9.366E+19	8.247E+19	7.337E+19	8.483E+19	8.666E+19	2.000E-07	1.165E+19	1.027E+19	9.139E+18	1.056E+19	1.079E+19
3.400E-09	9.855E+19	8.677E+19	7.720E+19	8.925E+19	9.118E+19	2.100E-07	1.111E+19	9.790E+18	8.714E+18	1.007E+19	1.029E+19
3.600E-09	1.034E+20	9.103E+19									

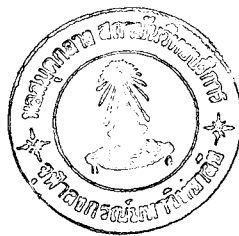
Energy (MeV)	A	B	C	D	Energy (MeV)	A	B	C	D	E	
4.250E-07	3.941E+18	4.812E+18	4.286E+18	5.422E+18	5.552E+18	3.600E-05	4.719E+16	5.746E+16	5.031E+16	6.364E+16	6.503E+16
4.500E-07	3.729E+18	4.565E+18	4.065E+18	5.146E+18	5.269E+18	3.800E-05	4.478E+16	5.458E+16	4.775E+16	6.029E+16	6.159E+16
4.750E-07	3.535E+18	4.332E+18	3.858E+18	4.886E+18	5.004E+18	4.000E-05	4.230E+16	5.165E+16	4.515E+16	5.690E+16	5.810E+16
5.000E-07	3.367E+18	4.129E+18	3.677E+18	4.659E+18	4.771E+18	4.250E-05	3.981E+16	4.872E+16	4.256E+16	5.353E+16	5.464E+16
5.250E-07	3.189E+18	3.911E+18	3.483E+18	4.413E+18	4.518E+18	4.500E-05	3.784E+16	4.619E+16	4.046E+16	5.048E+16	5.150E+16
5.500E-07	3.042E+18	3.730E+18	3.322E+18	4.209E+18	4.310E+18	4.750E-05	3.640E+16	4.405E+16	3.820E+16	4.776E+16	4.870E+16
5.750E-07	2.928E+18	3.588E+18	3.196E+18	4.049E+18	4.146E+18	5.000E-05	3.581E+16	4.265E+16	3.676E+16	4.577E+16	4.663E+16
6.000E-07	2.793E+18	3.424E+18	3.050E+18	3.864E+18	3.977E+18	5.250E-05	3.419E+16	4.024E+16	3.460E+16	4.285E+16	4.363E+16
6.300E-07	2.661E+18	3.264E+18	2.908E+18	3.684E+18	3.772E+18	5.500E-05	3.303E+16	3.893E+16	3.386E+16	4.135E+16	4.209E+16
6.600E-07	2.542E+18	3.120E+18	2.779E+18	3.521E+18	3.606E+18	5.750E-05	3.135E+16	3.708E+16	3.260E+16	3.929E+16	3.998E+16
6.900E-07	2.435E+18	2.989E+18	2.663E+18	3.374E+18	3.455E+18	6.000E-05	2.988E+16	3.551E+16	3.093E+16	3.754E+16	3.819E+16
7.200E-07	2.332E+18	2.863E+18	2.551E+18	3.233E+18	3.310E+18	6.300E-05	2.832E+16	3.384E+16	2.928E+16	3.570E+16	3.632E+16
7.600E-07	2.199E+18	2.701E+18	2.407E+18	3.050E+18	3.123E+18	6.600E-05	2.684E+16	3.233E+16	2.769E+16	3.405E+16	3.463E+16
8.000E-07	2.091E+18	2.568E+18	2.289E+18	2.899E+18	2.968E+18	6.900E-05	2.548E+16	3.097E+16	2.648E+16	3.257E+16	3.310E+16
8.400E-07	1.996E+18	2.451E+18	2.185E+18	2.767E+18	2.833E+18	7.200E-05	2.395E+16	2.950E+16	2.525E+16	3.098E+16	3.147E+16
8.800E-07	1.906E+18	2.340E+18	2.087E+18	2.642E+18	2.705E+18	7.600E-05	2.226E+16	2.789E+16	2.370E+16	2.923E+16	2.968E+16
9.200E-07	1.824E+18	2.239E+18	1.996E+18	2.527E+18	2.588E+18	8.000E-05	2.081E+16	2.657E+16	2.280E+16	2.779E+16	2.820E+16
9.600E-07	1.752E+18	2.149E+18	1.916E+18	2.426E+18	2.484E+18	8.400E-05	1.944E+16	2.533E+16	2.170E+16	2.644E+16	2.683E+16
1.000E-06	1.675E+18	2.055E+18	1.832E+18	2.319E+18	2.375E+18	8.800E-05	1.810E+16	2.414E+16	2.070E+16	2.514E+16	2.549E+16
1.050E-06	1.597E+18	1.960E+18	1.748E+18	2.212E+18	2.264E+18	9.200E-05	1.685E+16	2.305E+16	1.981E+16	2.397E+16	2.434E+16
1.100E-06	1.520E+18	1.866E+18	1.665E+18	2.106E+18	2.156E+18	9.600E-05	1.530E+16	2.205E+16	1.900E+16	2.278E+16	2.307E+16
1.150E-06	1.460E+18	1.792E+18	1.599E+18	2.022E+18	2.070E+18	1.000E-04	1.373E+16	2.104E+16	1.818E+16	2.155E+16	2.181E+16
1.200E-06	1.387E+18	1.703E+18	1.520E+18	1.921E+18	1.966E+18	1.050E-04	1.244E+16	2.009E+16	1.928E+16	2.038E+16	2.062E+16
1.275E-06	1.310E+18	1.607E+18	1.435E+18	1.812E+18	1.856E+18	1.100E-04	1.134E+16	1.930E+16	1.664E+16	1.940E+16	1.962E+16
1.350E-06	1.239E+18	1.519E+18	1.357E+18	1.714E+18	1.755E+18	1.150E-04	1.022E+16	1.840E+16	1.585E+16	1.833E+16	1.854E+16
1.425E-06	1.177E+18	1.441E+18	1.287E+18	1.625E+18	1.664E+18	1.200E-04	9.164E+15	1.748E+16	1.525E+16	1.725E+16	1.745E+16
1.500E-06	1.111E+18	1.360E+18	1.215E+18	1.534E+18	1.571E+18	1.250E-04	8.416E+15	1.648E+16	1.417E+16	1.619E+16	1.638E+16
1.600E-06	1.045E+18	1.279E+18	1.144E+18	1.442E+18	1.476E+18	1.300E-04	8.089E+15	1.562E+16	1.343E+16	1.536E+16	1.554E+16
1.700E-06	9.869E+17	1.207E+18	1.080E+18	1.360E+18	1.393E+18	1.425E-04	8.196E+15	1.483E+16	1.362E+16	1.470E+16	1.485E+16
1.800E-06	9.326E+17	1.140E+18	1.021E+18	1.284E+18	1.315E+18	1.500E-04	8.563E+15	1.401E+16	1.352E+16	1.403E+16	1.417E+16
1.900E-06	8.852E+17	1.081E+18	9.688E+17	1.218E+18	1.247E+18	1.600E-04	9.352E+15	1.316E+16	1.300E+16	1.341E+16	1.352E+16
2.000E-06	8.429E+17	1.029E+18	9.229E+17	1.159E+18	1.186E+18	1.700E-04	9.983E+15	1.241E+16	1.063E+16	1.281E+16	1.290E+16
2.100E-06	8.046E+17	9.819E+17	8.812E+17	1.105E+18	1.131E+18	1.800E-04	1.014E+16	1.177E+16	1.027E+16	1.222E+16	1.228E+16
2.200E-06	7.696E+17	9.385E+17	8.430E+17	1.056E+18	1.081E+18	1.900E-04	1.089E+16	1.118E+16	1.072E+16	1.205E+16	1.204E+16
2.300E-06	7.379E+17	8.988E+17	8.082E+17	1.011E+18	1.025E+18	2.000E-04	1.268E+16	1.064E+16	9.145E+15	1.231E+16	1.279E+16
2.400E-06	7.024E+17	8.541E+17	7.690E+17	9.597E+17	9.824E+17	2.100E-04	1.326E+16	1.015E+16	8.665E+15	1.213E+16	1.273E+16
2.500E-06	6.638E+17	8.058E+17	7.270E+17	9.046E+17	9.259E+17	2.200E-04	1.400E+16	9.689E+15	8.281E+15	1.203E+16	1.279E+16
2.700E-06	6.354E+17	7.704E+17	6.964E+17	8.641E+17	8.844E+17	2.300E-04	1.080E+16	9.270E+15	8.129E+15	1.043E+16	1.070E+16
2.800E-06	6.042E+17	7.308E+17	6.623E+17	8.185E+17	8.378E+17	2.400E-04	7.719E+15	8.827E+15	8.627E+15	8.573E+15	8.362E+15
3.000E-06	5.684E+17	6.847E+17	6.233E+17	7.652E+17	7.830E+17	2.500E-04	7.141E+15	8.324E+15	8.111E+15	7.906E+15	7.639E+15
3.200E-06	5.379E+17	6.446E+17	5.901E+17	7.179E+17	7.345E+17	2.700E-04	6.722E+15	7.939E+15	7.104E+15	7.425E+15	7.124E+15
3.400E-06	5.127E+17	6.097E+17	5.622E+17	6.758E+17	6.912E+17	2.800E-04	6.379E+15	7.534E+15	6.758E+15	6.973E+15	6.662E+15
3.600E-06	4.920E+17	5.789E+17	5.390E+17	6.381E+17	6.524E+17	3.000E-04	5.917E+15	7.020E+15	6.046E+15	6.414E+15	6.083E+15
3.800E-06	4.751E+17	5.519E+17	5.208E+17	6.043E+17	6.175E+17	3.200E-04	7.452E+15	6.603E+15	6.510E+15	7.060E+15	7.082E+15
4.000E-06	4.600E+17	5.250E+17	5.065E+17	5.697E+17	5.818E+17	3.400E-04	8.946E+15	6.236E+15	5.919E+15	7.567E+15	7.962E+15
4.250E-06	4.460E+17	5.019E+17	4.967E+17	5.433E+17	5.433E+17	3.600E-04	5.004E+15	5.891E+15	5.783E+15	5.438E+15	5.182E+15
4.500E-06	4.272E+17	4.833E+17	4.907E+17	5.003E+17	5.089E+17	3.800E-04	4.779E+15	5.565E+15	5.453E+15	5.267E+15	5.064E+15
4.750E-06	4.608E+17	4.608E+17	4.737E+17	4.731E+17	4.809E+17	4.000E-04	4.426E+15	5.213E+15	4.712E+15	5.044E+15	4.880E+15
5.000E-06	4.362E+17	4.407E+17	4.499E+17	4.542E+17	4.618E+17	4.250E-04	4.109E+15	4.916E+15	4.820E+15	4.885E+15	4.787E+15
5.250E-06	3.751E+17	4.065E+17	4.063E+17	4.308E+17	4.391E+17	4.500E-04	3.894E+15	4.681E+15	4.104E+15	4.725E+15	4.678E+15
5.500E-06	3.481E+17	3.892E+17	3.766E+17	4.184E+17	4.269E+17	4.750E-04	3.641E+15	4.436E+15	4.524E+15	4.510E+15	4.483E+15
5.750E-06	3.215E+17	3.683E+17	3.476E+17	4.005E+17	4.091E+17	5.000E-04	3.415E+15	4.235E+15	3.666E+15	4.341E+15	4.329E+15
6.000E-06	2.988E+17	3.490E+17	3.234E+17	3.834E+17	3.918E+17	5.250E-04	3.249E+15	4.012E+15	3.918E+15	4.129E+15	4.135E+15
6.300E-06	2.793E+17	3.310E+17	3.028E+17	3.666E+17	3.749E+17	5.500E-04	3.177E+15	3.860E+15	3.349E+15	3.972E+15	3.993E+15
6.600E-06	2.632E+17	3.152E+17	2.861E+17	3.512E+17	3.593E+17	5.750E-04	3.110E+15	3.730E+15	3.798E+15	3.837E+15	3.866E+15
6.900E-06	2.492E+17	3.007E+17	2.715E+17	3.365E+17	3.444E+17	6.000E-04	2.972E+15	3.563E+15	3.614E+15	3.668E+15	3.700E+15
7.200E-06	2.353E+17	2.853E+17	2.565E+17	3.203E+17	3.278E+17	6.300E-04	2.807E+15	3.399E+15	3.400E+15	3.502E+15	3.535E+15
7.600E-06	2.230E+17	2.712E+17	2.429E+17	3.052E+17	3.124E+17	6.600E-04	2.671E+15	3.247E+15	2.889E+15	3.395E+15	3.370E+15
8.000E-06	2.109E+17	2.572E+17	2.298E+17	2.899E+17	2.968E+17	6.900E-04	2.555E+15	3.112E+15	3.199E+15	3.192E+15	3.219E+15
8.400E-06	2.000E+17	2.444E+17	2.181E+17	2.759E+17	2.825E+17	7.200E-04	2.445E+15	2.965E+15	2.803E+15	3.038E+15	3.064E+15
8.800E-06	1.914E+17	2.341E+17	2.086E+17	2.644E+17	2.708E+17	7.600E-04	2.309E+15	2.818E+15	2.664E+15	2.891E+15	2.916E+15
9.200E-06	1.828E+17	2.239E+17	1.993E+17	2.531E+17	2.592E+17	8.000E-04	2.155E+15	2.668E+15	2.719E+15	2.740E+15	2.761E+15
9.600E-06	1.753E+17	2.148E+17	1.910E+17	2.429E+17	2.488E+17	8.400E-04	2.038E+15	2.542E+15	2.390E+15	2.602E+15	2.615E+15
1.000E-05	1.677E+17	2.055E+17	1.826E+17	2.324E+17	2.380E+17	8.800E-04	1.922E+15	2.418E+15	2.101E+15	2.451E+15	2.448E+15
1.050E-05	1.602E+17	1.959E+17	1.739E+17	2.217E+17	2.271E+17	9.200E-04	1.829E+15	2.305E+15	2.308E+15	2.305E+15	2.283E+15
1.100E-05	1.538E+17	1.881E+17	1.668E+17	2.127E+17	2.179E+17	9.600E-04	1.776E+15	2.213E+15	2.297E+15	2.182E+15	2.146E+15
1.150E-05	1.465E+17	1.792E+17	1.588E+17	2.026E+17	2.076E+17	1.000E-03	1.737E+15	2.115E+15	2.041E+15	1.992E+15	1.916E+15
1.200E-05	1.393E+17	1.702E+17	1.508E+17	1.925E+17	1.972E+17	1.050E-03	1.677E+15	2.019E+15	1.781E+15	1.851E+15	1.757E+15
1.275E-05	1.316E+17	1.606E+17	1.422E+17	1.816E+17	1.861E+17	1.100E-03	1.592E+15	1.922E+15	1.925E+15	1.772E+15	1.688E+15
1.350E-05	1.246E+17	1.519E+17	1.344E+17	1.718E+17	1.760E+17	1.150E-03	1.491E+15	1.848E+15	1.824E+15	1.805E+15	1.769E+15
1.425E-05	1.184E+17	1.442E+17	1.275E+17	1.630E+17	1.671E+17	1.200E-03	1.396E+15				

Energy (MeV)	A	B	C	D	E	Energy (MeV)	A	R	C	D	E
3.000E-03	4.918E+14	6.822E+14	6.113E+14	7.626E+14	7.824E+14	2.500E-01	9.382E+12	8.066E+12	7.277E+12	1.002E+13	1.060E+13
3.200E-03	4.470E+14	6.409E+14	5.560E+14	7.166E+14	7.360E+14	2.700E-01	9.061E+12	7.702E+12	6.951E+12	9.603E+12	1.016E+13
3.400E-03	4.175E+14	6.041E+14	5.345E+14	6.773E+14	6.966E+14	2.800E-01	8.690E+12	7.303E+12	6.593E+12	9.133E+12	9.674E+12
3.600E-03	3.936E+14	5.713E+14	5.167E+14	6.417E+14	6.605E+14	3.000E-01	8.233E+12	6.830E+12	6.168E+12	8.573E+12	9.091E+12
3.800E-03	3.728E+14	5.421E+14	4.970E+14	6.095E+14	6.277E+14	3.200E-01	7.830E+12	6.419E+12	5.797E+12	8.082E+12	8.579E+12
4.000E-03	3.578E+14	5.125E+14	4.557E+14	5.579E+14	5.716E+14	3.400E-01	7.462E+12	6.053E+12	5.465E+12	7.640E+12	8.116E+12
4.250E-03	2.819E+14	4.831E+14	4.273E+14	5.078E+14	5.174E+14	3.600E-01	7.129E+12	5.725E+12	5.166E+12	7.242E+12	7.700E+12
4.500E-03	2.667E+14	4.563E+14	4.080E+14	4.787E+14	4.878E+14	3.800E-01	6.841E+12	5.434E+12	4.900E+12	6.891E+12	7.333E+12
4.750E-03	2.677E+14	4.349E+14	3.949E+14	5.730E+14	6.184E+14	4.000E-01	6.538E+12	5.143E+12	4.632E+12	6.532E+12	6.956E+12
5.000E-03	3.054E+14	4.094E+14	3.841E+14	4.665E+14	4.824E+14	4.250E-01	6.225E+12	4.855E+12	4.365E+12	6.169E+12	6.574E+12
5.250E-03	2.817E+14	3.914E+14	3.771E+14	4.407E+14	4.542E+14	4.500E-01	5.960E+12	4.605E+12	4.128E+12	5.849E+12	6.237E+12
5.500E-03	2.739E+14	3.789E+14	3.698E+14	4.256E+14	4.384E+14	4.750E-01	5.734E+12	4.391E+12	3.921E+12	5.566E+12	5.940E+12
5.750E-03	2.669E+14	3.612E+14	3.347E+14	4.088E+14	4.219E+14	5.000E-01	5.622E+12	4.282E+12	3.830E+12	5.438E+12	5.803E+12
6.000E-03	5.131E+14	3.444E+14	3.284E+14	4.586E+14	4.960E+14	5.250E-01	5.754E+12	4.291E+12	3.855E+12	5.467E+12	5.833E+12
6.300E-03	2.399E+14	3.285E+14	2.954E+14	3.722E+14	3.839E+14	5.500E-01	5.845E+12	4.302E+12	3.875E+12	5.483E+12	5.847E+12
6.600E-03	2.208E+14	3.135E+14	2.771E+14	3.513E+14	3.612E+14	5.750E-01	5.934E+12	4.316E+12	3.891E+12	5.493E+12	5.854E+12
6.900E-03	2.116E+14	3.002E+14	3.302E+14	3.302E+14	3.371E+14	6.000E-01	5.997E+12	4.328E+12	3.904E+12	5.499E+12	5.857E+12
7.200E-03	1.970E+14	2.862E+14	2.664E+14	3.126E+14	3.188E+14	6.300E-01	6.044E+12	4.342E+12	3.913E+12	5.499E+12	5.853E+12
7.600E-03	1.789E+14	2.710E+14	2.411E+14	2.970E+14	3.042E+14	6.600E-01	6.080E+12	4.355E+12	3.919E+12	5.492E+12	5.839E+12
8.000E-03	1.800E+14	2.580E+14	2.296E+14	2.885E+14	2.962E+14	6.900E-01	6.113E+12	4.365E+12	3.920E+12	5.471E+12	5.813E+12
8.400E-03	1.781E+14	2.461E+14	2.203E+14	2.723E+14	2.777E+14	7.200E-01	6.139E+12	4.366E+12	3.918E+12	5.437E+12	5.769E+12
8.800E-03	1.771E+14	2.346E+14	2.071E+14	2.622E+14	2.680E+14	7.500E-01	6.147E+12	4.358E+12	3.911E+12	5.378E+12	5.705E+12
9.200E-03	3.359E+14	2.249E+14	2.009E+14	2.994E+14	3.233E+14	8.000E-01	6.139E+12	4.337E+12	3.898E+12	5.325E+12	5.628E+12
9.600E-03	1.591E+14	2.156E+14	1.916E+14	2.367E+14	2.403E+14	8.400E-01	6.117E+12	4.307E+12	3.881E+12	5.250E+12	5.535E+12
1.000E-02	2.654E+14	2.061E+14	1.873E+14	2.622E+14	2.787E+14	8.800E-01	6.101E+12	4.282E+12	3.859E+12	5.162E+12	5.427E+12
1.050E-02	1.626E+14	1.965E+14	1.737E+14	2.209E+14	2.256E+14	9.200E-01	6.077E+12	4.256E+12	3.832E+12	5.059E+12	5.303E+12
1.100E-02	1.562E+14	1.884E+14	1.682E+14	2.121E+14	2.167E+14	9.600E-01	5.710E+12	4.274E+12	3.912E+12	4.919E+12	5.139E+12
1.150E-02	1.492E+14	1.796E+14	1.600E+14	2.023E+14	2.068E+14	1.000E+00	5.802E+12	4.242E+12	3.862E+12	4.700E+12	4.880E+12
1.200E-02	1.421E+14	1.706E+14	1.621E+14	1.924E+14	1.967E+14	1.100E+00	2.917E+12	4.098E+12	3.444E+12	4.301E+12	4.436E+12
1.275E-02	1.344E+14	1.609E+14	1.628E+14	1.816E+14	1.858E+14	1.200E+00	2.818E+12	3.929E+12	3.338E+12	4.053E+12	4.151E+12
1.350E-02	1.290E+14	1.522E+14	1.372E+14	1.726E+14	1.768E+14	1.300E+00	3.037E+12	3.765E+12	3.239E+12	3.831E+12	3.897E+12
1.425E-02	1.229E+14	1.444E+14	1.282E+14	1.640E+14	1.680E+14	1.400E+00	3.059E+12	3.613E+12	3.133E+12	3.639E+12	3.687E+12
1.500E-02	1.181E+14	1.362E+14	1.214E+14	1.555E+14	1.596E+14	1.500E+00	3.073E+12	3.505E+12	3.043E+12	3.482E+12	3.524E+12
1.600E-02	1.117E+14	1.279E+14	1.315E+14	1.463E+14	1.503E+14	1.600E+00	3.104E+12	3.432E+12	2.909E+12	3.344E+12	3.390E+12
1.700E-02	1.061E+14	1.205E+14	1.068E+14	1.380E+14	1.418E+14	1.700E+00	3.088E+12	3.359E+12	2.789E+12	3.211E+12	3.263E+12
1.800E-02	1.013E+14	1.141E+14	1.021E+14	1.310E+14	1.348E+14	1.800E+00	3.090E+12	3.266E+12	2.672E+12	3.075E+12	3.131E+12
1.900E-02	9.650E+13	1.083E+14	9.662E+13	1.245E+14	1.281E+14	1.900E+00	3.068E+12	3.101E+12	2.552E+12	2.923E+12	2.972E+12
2.000E-02	9.266E+13	1.031E+14	9.152E+13	1.188E+14	1.223E+14	2.000E+00	3.077E+12	2.965E+12	2.455E+12	2.781E+12	2.828E+12
2.100E-02	8.924E+13	9.827E+13	8.757E+13	1.135E+14	1.169E+14	2.100E+00	3.037E+12	2.854E+12	2.331E+12	2.651E+12	2.699E+12
2.200E-02	8.603E+13	9.390E+13	9.310E+13	1.086E+14	1.119E+14	2.200E+00	2.827E+12	2.685E+12	2.224E+12	2.511E+12	2.554E+12
2.300E-02	8.308E+13	8.989E+13	8.070E+13	1.041E+14	1.073E+14	2.300E+00	2.578E+12	2.508E+12	2.112E+12	2.374E+12	2.409E+12
2.400E-02	7.944E+13	8.536E+13	7.644E+13	9.887E+13	1.020E+14	2.400E+00	2.368E+12	2.341E+12	2.001E+12	2.242E+12	2.271E+12
2.550E-02	7.520E+13	8.051E+13	7.241E+13	9.329E+13	9.621E+13	2.500E+00	2.183E+12	2.183E+12	1.915E+12	2.115E+12	2.138E+12
2.700E-02	7.245E+13	7.681E+13	6.879E+13	8.923E+13	9.210E+13	2.600E+00	2.019E+12	2.040E+12	1.812E+12	1.995E+12	2.015E+12
2.800E-02	6.939E+13	7.288E+13	6.485E+13	8.486E+13	8.764E+13	2.700E+00	1.852E+12	1.909E+12	1.722E+12	1.884E+12	1.901E+12
3.000E-02	6.555E+13	6.817E+13	6.223E+13	7.973E+13	8.249E+13	2.800E+00	1.664E+12	1.779E+12	1.664E+12	1.779E+12	1.793E+12
3.200E-02	6.205E+13	6.405E+13	5.721E+13	7.512E+13	7.780E+13	2.900E+00	1.482E+12	1.654E+12	1.536E+12	1.680E+12	1.696E+12
3.400E-02	5.879E+13	6.040E+13	5.379E+13	7.076E+13	7.324E+13	3.000E+00	1.356E+12	1.538E+12	1.455E+12	1.586E+12	1.602E+12
3.600E-02	5.576E+13	5.712E+13	5.119E+13	6.690E+13	6.924E+13	3.100E+00	1.297E+12	1.430E+12	1.396E+12	1.497E+12	1.513E+12
3.800E-02	5.311E+13	5.420E+13	4.888E+13	6.355E+13	6.580E+13	3.200E+00	1.251E+12	1.329E+12	1.288E+12	1.412E+12	1.428E+12
4.000E-02	5.027E+13	5.125E+13	4.562E+13	6.011E+13	6.224E+13	3.300E+00	1.191E+12	1.236E+12	1.212E+12	1.330E+12	1.346E+12
4.250E-02	4.733E+13	4.830E+13	4.295E+13	5.664E+13	5.864E+13	3.400E+00	1.134E+12	1.152E+12	1.140E+12	1.253E+12	1.269E+12
4.500E-02	4.505E+13	4.600E+13	4.114E+13	5.393E+13	5.583E+13	3.500E+00	1.072E+12	1.076E+12	1.075E+12	1.180E+12	1.196E+12
4.750E-02	4.243E+13	4.338E+13	3.872E+13	5.083E+13	5.262E+13	3.600E+00	9.922E+11	1.004E+12	1.011E+12	1.110E+12	1.126E+12
5.000E-02	4.029E+13	4.125E+13	3.706E+13	4.830E+13	5.000E+13	3.700E+00	9.069E+11	9.371E+11	9.490E+11	1.043E+12	1.059E+12
5.250E-02	3.816E+13	3.912E+13	3.496E+13	4.579E+13	4.739E+13	3.800E+00	8.210E+11	8.753E+11	8.910E+11	9.797E+11	9.954E+11
5.500E-02	3.665E+13	3.741E+13	3.407E+13	4.384E+13	4.539E+13	3.900E+00	7.702E+11	8.178E+11	8.361E+11	9.201E+11	9.354E+11
5.750E-02	3.541E+13	3.595E+13	3.213E+13	4.217E+13	4.368E+13	4.000E+00	7.187E+11	7.638E+11	7.852E+11	8.633E+11	8.782E+11
6.000E-02	3.402E+13	3.439E+13	3.075E+13	4.039E+13	4.185E+13	4.100E+00	6.708E+11	7.131E+11	7.362E+11	8.093E+11	8.238E+11
6.300E-02	3.233E+13	3.278E+13	2.933E+13	3.855E+13	3.996E+13	4.200E+00	6.258E+11	6.655E+11	6.903E+11	7.582E+11	7.720E+11
6.600E-02	3.116E+13	3.132E+13	2.782E+13	3.687E+13	3.821E+13	4.300E+00	5.832E+11	6.206E+11	6.468E+11	7.096E+11	7.227E+11
6.900E-02	2.993E+13	2.999E+13	2.682E+13	3.533E+13	3.664E+13	4.400E+00	5.439E+11	5.787E+11	6.055E+11	6.637E+11	6.761E+11
7.200E-02	2.861E+13	2.852E+13	2.557E+13	3.362E+13	3.487E+13	4.500E+00	5.074E+11	5.396E+11	5.671E+11	6.205E+11	6.322E+11
7.600E-02	2.726E+13	2.703E+13	2.425E+13	3.187E+13	3.306E+13	4.600E+00	4.734E+11	5.032E+11	5.305E+11	5.800E+11	5.911E+11
8.000E-02	2.606E+13	2.577E+13	2.300E+13	3.039E+13	3.153E+13	4.700E+00	4.416E+11	4.693E+11	4.962E+11	5.421E+11	5.527E+11
8.400E-02	2.487E+13	2.458E+13	2.176E+13	2.899E+13	3.008E+13	4.800E+00	4.121E+11	4.377E+11	4.641E+11	5.067E+11	5.167E+11
8.800E-02	2.388E+13	2.348E+13	2.097E+13	2.775E+13	2.881E+13	4.900E+00	3.849E+11	4.083E+11	4.338E+11	4.734E+11	4.829E+11
9.200E-02	2.305E+13	2.251E+13	2.015E+13	2.666E+13	2.770E+13	5.000E+00	3.590E+11	3.806E+11	4.051E+11	4.420E+11	4.508E+11
9.600E-02	2.224E+13	2.157E+13	1.932E+13	2.561E+13	2.663E+13	5.100E+00	3.346E+11	3.548E+11	3.786E+11	4.124E+11	4.206E+11
1.000E-01	2.138E+13	2.063E+13	1.848E+13	2.454E+13	2.553E+13	5.200E+00	3.120E+11	3.307E+11	3.540E+11	3.847E+11	3.922E+11
1.050E-01	2.052E+13	1.968E+13	1.762E+13	2.344E+13	2.439E+13	5.300E+00	2.910E+				

Energy (MeV)	A	B	C	D	E	Energy (MeV)	A	B	C	D	E
7.000E+00	1.041E+11	1.067E+11	1.011E+11	1.227E+11	1.243E+11	1.570E+01	1.603E+08	1.236E+08	9.441E+07	1.100E+08	1.121E+08
7.100E+00	9.785E+10	1.007E+11	9.402E+10	1.149E+11	1.164E+11	1.580E+01	1.473E+08	1.136E+08	8.677E+07	1.010E+08	1.030E+08
7.200E+00	9.200E+10	9.475E+10	8.738E+10	1.070E+11	1.080E+11	1.590E+01	1.354E+08	1.044E+08	7.972E+07	9.283E+07	9.465E+07
7.300E+00	8.659E+10	8.907E+10	8.117E+10	9.943E+10	9.974E+10	1.600E+01	1.244E+08	9.593E+07	7.328E+07	8.529E+07	8.696E+07
7.400E+00	8.126E+10	8.362E+10	7.537E+10	9.256E+10	9.255E+10	1.610E+01	1.143E+08	8.815E+07	6.732E+07	7.835E+07	7.989E+07
7.500E+00	7.551E+10	7.842E+10	6.998E+10	8.684E+10	8.729E+10	1.620E+01	1.050E+08	8.099E+07	6.184E+07	7.197E+07	7.339E+07
7.600E+00	6.994E+10	7.347E+10	6.497E+10	8.144E+10	8.241E+10	1.630E+01	9.649E+07	7.443E+07	5.683E+07	6.613E+07	6.744E+07
7.700E+00	6.510E+10	6.874E+10	6.029E+10	7.589E+10	7.686E+10	1.640E+01	8.868E+07	6.840E+07	5.222E+07	6.076E+07	6.196E+07
7.800E+00	6.058E+10	6.424E+10	5.593E+10	7.062E+10	7.155E+10	1.650E+01	8.144E+07	6.283E+07	4.795E+07	5.580E+07	5.690E+07
7.900E+00	5.639E+10	5.997E+10	5.187E+10	6.561E+10	6.643E+10	1.660E+01	7.479E+07	5.770E+07	4.403E+07	5.124E+07	5.225E+07
8.000E+00	5.259E+10	5.594E+10	4.807E+10	6.084E+10	6.146E+10	1.670E+01	6.870E+07	5.300E+07	4.044E+07	4.706E+07	4.799E+07
8.100E+00	4.910E+10	5.221E+10	4.456E+10	5.640E+10	5.679E+10	1.680E+01	6.309E+07	4.868E+07	3.714E+07	4.321E+07	4.407E+07
8.200E+00	4.586E+10	4.870E+10	4.130E+10	5.227E+10	5.246E+10	1.690E+01	5.794E+07	4.471E+07	3.410E+07	3.968E+07	4.047E+07
8.300E+00	4.283E+10	4.540E+10	3.827E+10	4.843E+10	4.843E+10	1.700E+01	5.321E+07	4.106E+07	3.132E+07	3.644E+07	3.717E+07
8.400E+00	3.997E+10	4.229E+10	3.546E+10	4.486E+10	4.472E+10	1.710E+01	4.886E+07	3.770E+07	2.876E+07	3.346E+07	3.412E+07
8.500E+00	3.727E+10	3.936E+10	3.284E+10	4.154E+10	4.129E+10	1.720E+01	4.487E+07	3.462E+07	2.640E+07	3.072E+07	3.133E+07
8.600E+00	3.475E+10	3.661E+10	3.041E+10	3.847E+10	3.812E+10	1.730E+01	4.120E+07	3.179E+07	2.424E+07	2.821E+07	2.877E+07
8.700E+00	3.239E+10	3.404E+10	2.816E+10	3.561E+10	3.518E+10	1.740E+01	3.783E+07	2.919E+07	2.225E+07	2.590E+07	2.641E+07
8.800E+00	3.018E+10	3.163E+10	2.606E+10	3.295E+10	3.246E+10	1.750E+01	3.473E+07	2.680E+07	2.043E+07	2.377E+07	2.425E+07
8.900E+00	2.811E+10	2.938E+10	2.412E+10	3.049E+10	2.995E+10	1.760E+01	3.189E+07	2.461E+07	1.876E+07	2.182E+07	2.226E+07
9.000E+00	2.618E+10	2.728E+10	2.232E+10	2.821E+10	2.763E+10	1.770E+01	2.927E+07	2.259E+07	1.721E+07	2.003E+07	2.043E+07
9.100E+00	2.437E+10	2.533E+10	2.066E+10	2.610E+10	2.549E+10	1.780E+01	2.687E+07	2.073E+07	1.580E+07	1.838E+07	1.875E+07
9.200E+00	2.269E+10	2.350E+10	1.911E+10	2.414E+10	2.351E+10	1.790E+01	2.466E+07	1.906E+07	1.450E+07	1.687E+07	1.721E+07
9.300E+00	2.111E+10	2.180E+10	1.768E+10	2.232E+10	2.168E+10	1.800E+01	0.000E-01	0.000E-01	0.000E-01	0.000E-01	0.000E-01
9.400E+00	1.964E+10	2.022E+10	1.635E+10	2.064E+10	2.006E+10						
9.500E+00	1.828E+10	1.874E+10	1.512E+10	1.908E+10	1.845E+10						
9.600E+00	1.695E+10	1.737E+10	1.398E+10	1.764E+10	1.703E+10						
9.700E+00	1.573E+10	1.609E+10	1.292E+10	1.631E+10	1.573E+10						
9.800E+00	1.457E+10	1.491E+10	1.194E+10	1.508E+10	1.453E+10						
9.900E+00	1.347E+10	1.380E+10	1.104E+10	1.395E+10	1.344E+10						
1.000E+01	1.245E+10	1.278E+10	1.020E+10	1.290E+10	1.243E+10						
1.010E+01	1.154E+10	1.182E+10	9.424E+09	1.192E+10	1.148E+10						
1.020E+01	1.070E+10	1.094E+10	8.707E+09	1.101E+10	1.059E+10						
1.030E+01	9.915E+09	1.011E+10	8.042E+09	1.017E+10	9.758E+09						
1.040E+01	9.187E+09	9.353E+09	7.427E+09	9.390E+09	8.999E+09						
1.050E+01	8.512E+09	8.649E+09	6.859E+09	8.670E+09	8.297E+09						
1.060E+01	7.889E+09	7.998E+09	6.334E+09	8.004E+09	7.647E+09						
1.070E+01	7.306E+09	7.393E+09	5.847E+09	7.388E+09	7.049E+09						
1.080E+01	6.766E+09	6.833E+09	5.397E+09	6.818E+09	6.495E+09						
1.090E+01	6.268E+09	6.315E+09	4.981E+09	6.292E+09	5.984E+09						
1.100E+01	5.806E+09	5.836E+09	4.593E+09	5.805E+09	5.512E+09						
1.110E+01	5.380E+09	5.393E+09	4.238E+09	5.357E+09	5.077E+09						
1.120E+01	4.981E+09	4.982E+09	3.911E+09	4.942E+09	4.677E+09						
1.130E+01	4.603E+09	4.600E+09	3.608E+09	4.559E+09	4.312E+09						
1.140E+01	4.249E+09	4.247E+09	3.325E+09	4.206E+09	3.977E+09						
1.150E+01	3.923E+09	3.921E+09	3.069E+09	3.880E+09	3.668E+09						
1.160E+01	3.621E+09	3.619E+09	2.830E+09	3.579E+09	3.382E+09						
1.170E+01	3.342E+09	3.341E+09	2.610E+09	3.301E+09	3.120E+09						
1.180E+01	3.083E+09	3.083E+09	2.406E+09	3.044E+09	2.876E+09						
1.190E+01	2.843E+09	2.843E+09	2.219E+09	2.807E+09	2.652E+09						
1.200E+01	2.624E+09	2.623E+09	2.045E+09	2.588E+09	2.444E+09						
1.210E+01	2.657E+09	2.421E+09	1.885E+09	2.332E+09	2.253E+09						
1.220E+01	2.641E+09	2.234E+09	1.737E+09	2.107E+09	2.075E+09						
1.230E+01	2.521E+09	2.062E+09	1.601E+09	1.922E+09	1.912E+09						
1.240E+01	2.368E+09	1.902E+09	1.475E+09	1.760E+09	1.761E+09						
1.250E+01	2.209E+09	1.754E+09	1.359E+09	1.615E+09	1.622E+09						
1.260E+01	2.053E+09	1.618E+09	1.252E+09	1.484E+09	1.494E+09						
1.270E+01	1.903E+09	1.491E+09	1.153E+09	1.363E+09	1.375E+09						
1.280E+01	1.761E+09	1.375E+09	1.062E+09	1.253E+09	1.267E+09						
1.290E+01	1.628E+09	1.267E+09	9.781E+08	1.153E+09	1.166E+09						
1.300E+01	1.504E+09	1.168E+09	9.011E+08	1.060E+09	1.074E+09						
1.310E+01	1.388E+09	1.076E+09	8.298E+08	9.748E+08	9.882E+08						
1.320E+01	1.281E+09	9.920E+08	7.641E+08	8.969E+08	9.098E+08						
1.330E+01	1.181E+09	9.142E+08	7.036E+08	8.252E+08	8.377E+08						
1.340E+01	1.088E+09	8.424E+08	6.478E+08	7.593E+08	7.712E+08						
1.350E+01	1.003E+09	7.759E+08	5.962E+08	6.984E+08	7.096E+08						
1.360E+01	9.239E+08	7.146E+08	5.485E+08	6.422E+08	6.527E+08						
1.370E+01	8.512E+08	6.582E+08	5.048E+08	5.907E+08	6.005E+08						
1.380E+01	7.841E+08	6.062E+08	4.646E+08	5.434E+08	5.526E+08						
1.390E+01	7.220E+08	5.581E+08	4.274E+08	4.998E+08	5.084E+08						
1.400E+01	6.648E+08	5.137E+08	3.935E+08	4.597E+08	4.677E+08						
1.410E+01	6.120E+08	4.727E+08	3.620E+08	4.228E+08	4.302E+08						
1.420E+01	5.633E+08	4.349E+08	3.320E+08	3.888E+08	3.957E+08						
1.430E+01	5.184E+08	4.007E+08	3.063E+08	3.575E+08	3.640E+08						
1.440E+01	4.770E+08	3.682E+08	2.817E+08	3.288E+08	3.348E+08						
1.450E+01	4.388E+08	3.387E+08	2.591E+08	3.023E+08	3.079E+08						
1.460E+01	4.037E+08	3.115E+08	2.383E+08	2.779E+08	2.831E+08						
1.470E+01	3.713E+08	2.865E+08	2.192E+08	2.556E+08	2.603E+08						
1.480E+01	3.416E+08	2.635E+08	2.016E+08	2.350E+08	2.394E+08						
1.490E+01	3.142E+08	2.423E+08	1.853E+08	2.160E+08	2.201E+08						
1.500E+01	2.897E+08	2.228E+08	1.704E+08	1.986E+08	2.024E+08						
1.510E+01	2.675E+08	2.049E+08	1.567E+08	1.825E+08	1.860E+08						
1.520E+01	2.443E+08	1.884E+08	1.440E+08	1.678E+08	1.710E+08						
1.530E+01	2.246E+08	1.732E+08	1.324E+08	1.542E+08	1.572E+08						
1.540E+01	2.064E+08	1.592E+08	1.217E+08	1.417E+08	1.445E+08						
1.550E+01	1.897E+08	1.463E+08	1.118E+08	1.302E+08	1.327E+08						
1.560E+01	1.744E+08	1.345E+08	1.027E+08	1.197E+08	1.220E+08						

Neutron flux densityคำนวณจาก
ข้อมูลของผู้ผลิตเครื่องปฏิกรณ์ฯ

Energy(MeV)	ϕ	Energy(MeV)	ϕ	Energy(MeV)	ϕ
1.00E-10	2.871E+18	7.20E-03	7.949E+13	3.70E+00	3.790E+11
1.00E-09	2.156E+19	9.20E-03	6.064E+13	4.10E+00	2.908E+11
1.00E-08	4.656E+19	1.20E-02	4.659E+13	4.50E+00	2.175E+11
2.30E-08	5.079E+19	1.50E-02	3.692E+13	5.00E+00	1.587E+11
5.00E-08	3.373E+19	1.90E-02	2.917E+13	5.50E+00	1.137E+11
7.60E-08	1.953E+19	2.55E-02	2.336E+13	6.00E+00	7.590E+10
1.15E-07	7.667E+18	3.20E-02	1.933E+13	6.70E+00	4.729E+10
1.70E-07	3.573E+18	4.00E-02	1.587E+13	7.40E+00	2.842E+10
2.55E-07	2.190E+18	5.25E-02	1.317E+13	8.20E+00	1.690E+10
3.80E-07	1.116E+18	6.60E-02	1.104E+13	9.00E+00	1.055E+10
5.50E-07	6.965E+17	8.80E-02	9.229E+12	1.00E+01	6.817E+09
8.40E-07	4.441E+17	1.10E-01	7.991E+12	1.10E+01	4.141E+09
1.28E-06	2.905E+17	1.35E-01	7.128E+12	1.20E+01	2.185E+09
1.90E-06	1.968E+17	1.60E-01	6.479E+12	1.30E+01	1.193E+09
2.80E-06	1.371E+17	1.90E-01	5.926E+12	1.40E+01	6.870E+08
4.25E-06	9.537E+16	2.20E-01	5.459E+12	1.50E+01	4.138E+08
6.30E-06	6.754E+16	2.55E-01	5.052E+12	1.60E+01	2.648E+08
9.20E-06	4.806E+16	2.90E-01	4.741E+12	1.70E+01	1.869E+08
1.35E-05	3.300E+16	3.20E-01	4.478E+12	1.80E+01	1.401E+08
2.10E-05	2.237E+16	3.60E-01	4.247E+12	1.90E+01	6.602E+07
3.00E-05	1.561E+16	4.00E-01	4.044E+12		
4.50E-05	1.051E+16	4.50E-01	3.849E+12		
6.90E-05	7.140E+15	5.00E-01	3.683E+12		
1.00E-04	5.136E+15	5.50E-01	3.538E+12		
1.35E-04	3.945E+15	6.00E-01	3.339E+12		
1.70E-04	3.112E+15	6.60E-01	3.237E+12		
2.20E-04	2.436E+15	7.20E-01	3.068E+12		
2.80E-04	1.916E+15	7.80E-01	2.921E+12		
3.60E-04	1.517E+15	8.40E-01	2.771E+12		
4.50E-04	1.208E+15	9.20E-01	2.620E+12		
5.75E-04	9.375E+14	1.00E+00	2.379E+12		
7.60E-04	7.293E+14	1.20E+00	2.061E+12		
9.60E-04	5.701E+14	1.40E+00	1.805E+12		
1.28E-03	4.442E+14	1.60E+00	1.606E+12		
1.60E-03	3.575E+14	1.80E+00	1.413E+12		
2.20E-03	2.791E+14	2.00E+00	1.193E+12		
2.70E-03	2.153E+14	2.30E+00	9.921E+11		
3.40E-03	1.688E+14	2.60E+00	8.431E+11		
4.50E-03	1.329E+14	2.90E+00	6.759E+11		
5.50E-03	1.048E+14	3.30E+00	5.005E+11		



รายการอ้างอิง

1. อุไรวรรณ จุณภาด. Reactor physics. กรุงเทพมหานคร : โรงพิมพ์มหาวิทยาลัยรามคำแหง, 2521.
2. International Atomic Energy Agency. Research Reactors and Alternative Devices. Technical Document no.351. Vienna, 1988.
3. International Atomic Energy Agency. Neutron Fluence Measurements. Technical Reports Series no.107. Vienna, 1970.
4. E.M. Zsolnay. Neutron Flux and Spectrum Measurement by Activation Method. The Regional Training Course on Calculation and Measurement of Neutron Flux Spectrum for Research Reactors. Jakarta, 1993.
5. R.G. Hawkins, S.Berg, T. Crockett and W.N. McElroy. A Computer Automated Iterative Method for Neutron Flux Spectra Determination by Foil Activation. AFWL-TR-67-41 Vol.1-IV. September, 1967.
6. วราวุธ ขจรฤทธิ์, สุนันทา ภัทรชาคร และ อารีรัตน์ คอนดวงแก้ว. การวัดนิวตรอนฟลักซ์ในเครื่องปฏิกรณ์ ปาว-1/1. รายงานวิชาการประจำปี 2533 สำนักงานพลังงานปรมาณูเพื่อสันติ : 109-112.
7. Reactor Experiments. Compilation of Neutron Detector Materials. B-44N. March, 1988.
8. มงคล จุลละนันท์, สุนันทา ภัทรชาคร และ อารีรัตน์ คอนดวงแก้ว. การวัดนิวตรอนฟลักซ์ในเครื่องปฏิกรณ์ปรมาณูวิจัย-1/1. พปส-1-122. กรุงเทพมหานคร : สำนักงานพลังงานปรมาณูเพื่อสันติ, 2528.
9. A.M. Niedritis, Kh.Ya. Bondars and M.A. Berzonis. Neutron Dosimetry System Saips: Manual for Users and Programmers (Version 87-02). INDC (CCP)-285/GR. Vienna, 1988.
10. E. Unfried, H.Böck, H.W. Weber and L.R. Greenwood. Neutron Flux Density in the Central Irradiation Thimble of the TRIGA MARK II Reactor in Vienna. The Proceeding of TRIGA User Conference. U.S.A., 1986.



ประวัติผู้เขียน

นาย วรารุช ขจรฤทธิ เกิดวันที่ 22 มีนาคม พ.ศ. 2508 ที่จังหวัดกรุงเทพมหานคร สำเร็จการศึกษาปริญญาตรีวิทยาศาสตร์บัณฑิต สาขาฟิสิกส์ ภาควิชาฟิสิกส์ มหาวิทยาลัยรามคำแหง ในปีการศึกษา 2528 เข้าศึกษาในหลักสูตรวิศวกรรมศาสตรมหาบัณฑิต สาขานิวเคลียร์เทคโนโลยี ภาควิชานิวเคลียร์เทคโนโลยี จุฬาลงกรณ์มหาวิทยาลัย เมื่อ พ.ศ.2532 ปัจจุบันรับราชการในตำแหน่งนักวิทยาศาสตร์นิวเคลียร์ระดับ 5 กองฟิสิกส์ สำนักงานพลังงานปรมาณูเพื่อสันติ กระทรวงวิทยาศาสตร์เทคโนโลยีและสิ่งแวดล้อม57



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