JEFF-3.1 TC-99
Principal cross sections

Cross section (barns)

Energy (MeV)

- total
- absorption
- elastic
- gamma production
JEFF-3.1 TC-99
resonance total cross section

Energy (MeV)

Cross section (barns)

- Total
JEFF-3.1 TC-99
resonance total cross section

Cross section (barns)

Energy (MeV)
JEFF-3.1 TC-99
resonance total cross section

Cross section (barns)

Energy (MeV)
JEFF-3.1 TC-99
resonance total cross section

Energy (MeV)

Cross section (barns)

total
JEFF-3.1 TC-99
resonance total cross section

Energy (MeV) vs. Cross section (barns)
JEFF-3.1 TC-99
resonance absorption cross sections

Cross section (barns)

Energy (MeV)
JEFF-3.1 TC-99
resonance absorption cross sections

Energy (MeV) vs. Cross section (barns)

- Capture curve

Graph showing the resonance absorption cross sections for TC-99.
JEFF-3.1 TC-99
resonance absorption cross sections
JEFF-3.1 TC-99
resonance absorption cross sections

Cross section (barns)

Energy (MeV)
JEFF-3.1 TC-99
resonance absorption cross sections

capture

Energy (MeV)

Cross section (barns)

$10^{-1}$

$10^{0}$
JEFF-3.1 TC-99
resonance absorption cross sections

Energy (MeV)

Cross section (barns)

- Energy (MeV) range from $10^0$ to $10^1$
- Cross section (barns) range from $10^{-3}$ to $10^{-1}$

The graph shows the relationship between energy and cross section for TC-99.
JEFF-3.1 TC-99
Damage

Energy (MeV) vs. Damage (MeV-barns) graph.
JEFF-3.1 TC-99
Non-threshold reactions

Cross section (barns) vs. Energy (MeV)

- (n,gma)
- (n,a)
- (n,xa)
JEFF-3.1 TC-99
Principal cross sections

Energy (MeV)

Cross section (barns)

total
absorption
elastic
gamma production
JEFF-3.1 TC-99 Heating

Heating (MeV/reaction) vs Energy (MeV)

- Heating curve increasing with energy.
JEFF-3.1 TC-99
Non-threshold reactions

Energy (MeV)

Cross section (barns)

- (n,gma)
- (n,a)
- (n,xa)
JEFF-3.1 TC-99
Inelastic levels

Energy (MeV)

Cross section (barns)

(n,n^6)

(n,n^7)

(n,n^8)

(n,n^9)

(n,n^10)
JEFF-3.1 TC-99
Inelastic levels

Cross section (barns) vs. Energy (MeV)

(n,n*16)
(n,n*17)
(n,n*18)
(n,n*19)
(n,n*20)
JEFF-3.1 TC-99
Threshold reactions

Energy (MeV)

Cross section (barns)

- (n,x)
- (n,2n)
- (n,3n)
- (n,n*)a
- (n,2n)a
JEFF-3.1 TC-99
Threshold reactions

Cross section (barns) vs. Energy (MeV)

- (n,2p)
- (n,pa)
JEFF-3.1 TC-99
Threshold reactions

Energy (MeV)

Cross section (barns)

- (n,xp)
- (n,xd)
- (n,xt)
- (n,xhe3)
- (n,p*0)
JEFF-3.1 TC-99
Threshold reactions

Energy (MeV)

Cross section (barns)

- (n,p*c)
- (n,d*0)
- (n,d*1)
- (n,d*2)
- (n,d*3)
JEFF-3.1 TC-99
Threshold reactions

Cross section (barns) vs. Energy (MeV)

- (n,t^2)
- (n,t^3)
- (n,t^4)
- (n,t^5)
- (n,t^c)
JEFF-3.1 TC-99
Threshold reactions

Cross section (barns)

Energy (MeV)
JEFF-3.1 TC-99
angular distribution for elastic
JEFF-3.1 TC-99
angular distribution for elastic

Prob/Cos

$10^1$

$10^{-1}$

$1.0$ $0.5$ $0.0$ $-0.5$ $-1.0$ $20$ $40$ $60$ $80$ $100$ $120$ $140$ $160$ $180$ $200$

Cosine

Energy (MeV)
JEFF-3.1 TC-99
angular distribution for (n,n*1)
JEFF-3.1 TC-99
angular distribution for (n,n*2)
JEFF-3.1 TC-99
angular distribution for \((n,n^*3)\)
JEFF-3.1 TC-99
angular distribution for (n,n*4)
JEFF-3.1 TC-99
angular distribution for (n,n*5)
JEFF-3.1 TC-99
angular distribution for (n,n*6)
JEFF-3.1 TC-99
angular distribution for (n,n*7)
JEFF-3.1 TC-99
angular distribution for (n,n*8)
JEFF-3.1 TC-99
angular distribution for (n,n*9)
JEFF-3.1 TC-99
angular distribution for (n,n\textsuperscript{*}10)
JEFF-3.1 TC-99
angular distribution for (n,n*11)
JEFF-3.1 TC-99
angular distribution for (n,n*12)
JEFF-3.1 TC-99
angular distribution for (n,n*13)
JEFF-3.1 TC-99
angular distribution for (n,n*14)
JEFF-3.1 TC-99
angular distribution for \((n,n^*15)\)
JEFF-3.1 TC-99
angular distribution for (n,n*16)
JEFF-3.1 TC-99
angular distribution for (n,n*17)
JEFF-3.1 TC-99
angular distribution for (n,n*18)
JEFF-3.1 TC-99
angular distribution for (n,n*19)
JEFF-3.1 TC-99
angular distribution for (n,n*20)
JEFF-3.1 TC-99
Neutron emission for (n,x)
JEFF-3.1 TC-99
Neutron emission for (n,2n)
JEFF-3.1 TC-99
Neutron emission for (n,3n)
JEFF-3.1 TC-99
Neutron emission for \((n,n^*)a\)
JEFF-3.1 TC-99
Neutron emission for (n,2n)a
JEFF-3.1 TC-99
Neutron emission for \((n,n^*)p\)
JEFF-3.1 TC-99
Neutron emission for \((n,n^*)d\)
JEFF-3.1 TC-99
Neutron emission for ($n, n^*$)t
JEFF-3.1 TC-99
Neutron emission for (n,2np)
JEFF-3.1 TC-99
Photon emission for (n,x)
JEFF-3.1 TC-99
Photon emission for (n,2n)
JEFF-3.1 TC-99
Photon emission for (n,3n)
JEFF-3.1 TC-99
Photon emission for (n,n*)a
JEFF-3.1 TC-99
Photon emission for (n,2n)a
JEFF-3.1 TC-99
Photon emission for \((n,n^\ast)p\)
JEFF-3.1 TC-99
Photon emission for (n,n*)d
JEFF-3.1 TC-99
Photon emission for (n,n*)t
JEFF-3.1 TC-99
Photon emission for (n,2np)
JEFF-3.1 TC-99
Photon emission for (n,n*1)
JEFF-3.1 TC-99
Photon emission for \((n,n^*3)\)
JEFF-3.1 TC-99
Photon emission for \((n,n^*4)\)
JEFF-3.1 TC-99
Photon emission for (n,n*5)
JEFF-3.1 TC-99
Photon emission for (n,n*6)
JEFF-3.1 TC-99
Photon emission for (n,n*7)
JEFF-3.1 TC-99
Photon emission for (n,n*8)
JEFF-3.1 TC-99
Photon emission for (n,n*9)
JEFF-3.1 TC-99
Photon emission for \((n,n'10)\)
Photon emission for (n,n*11)

The graph shows the photon emission probability as a function of neutron energy ($E_n$) and gamma ray energy ($E_\gamma$). The x-axis represents the neutron energy in MeV, ranging from 0 to 200. The y-axis represents the probability in a log scale, ranging from $10^{-2}$ to $10^0$. The z-axis is not explicitly labeled, but it appears to represent the gamma ray energy. The graph highlights peaks at specific energy levels, indicating significant photon emissions at those energies.
JEFF-3.1 TC-99
Photon emission for (n,n*12)
JEFF-3.1 TC-99
Photon emission for (n,n'*13)
JEFF-3.1 TC-99
Photon emission for (n,n*14)
JEFF-3.1 TC-99
Photon emission for (n,n*15)
JEFF-3.1 TC-99
Photon emission for (n,n*16)
JEFF-3.1 TC-99
Photon emission for (n,n*17)
JEFF-3.1 TC-99
Photon emission for \((n,n^{*19})\)
JEFF-3.1 TC-99
Photon emission for (n,n*20)
JEFF-3.1 TC-99
Photon emission for (n,n*c)
JEFF-3.1 TC-99
Photon emission for (n,gma)
JEFF-3.1 TC-99
Photon emission for (n,2a)
JEFF-3.1 TC-99
Photon emission for (n,2p)
JEFF-3.1 TC-99
Photon emission for (n,pa)
JEFF-3.1 TC-99
Photon emission for (n,p*1)
JEFF-3.1 TC-99
Photon emission for (n,p*2)
JEFF-3.1 TC-99
Photon emission for \((n,p^*3)\)
JEFF-3.1 TC-99
Photon emission for (n,p*4)
JEFF-3.1 TC-99
Photon emission for (n,p*5)
JEFF-3.1 TC-99
Photon emission for (n,p*6)
JEFF-3.1 TC-99
Photon emission for (n,p*7)
JEFF-3.1 TC-99
Photon emission for (n,p^*8)
JEFF-3.1 TC-99
Photon emission for (n,p*9)
JEFF-3.1 TC-99
Photon emission for (n,p*10)
JEFF-3.1 TC-99
Photon emission for (n,p*c)
JEFF-3.1 TC-99
Photon emission for (n,d*1)
JEFF-3.1 TC-99
Photon emission for (n,d*2)
JEFF-3.1 TC-99
Photon emission for (n,d*3)
JEFF-3.1 TC-99
Photon emission for (n,d*4)
JEFF-3.1 TC-99
Photon emission for (n,d*5)
JEFF-3.1 TC-99
Photon emission for (n,d*c)
JEFF-3.1 TC-99
Photon emission for (n,t^3)
JEFF-3.1 TC-99
Photon emission for (n,t*4)
JEFF-3.1 TC-99
Photon emission for \((n,t^*5)\)
JEFF-3.1 TC-99
Photon emission for (n,he3*2)
JEFF-3.1 TC-99
Photon emission for (n,he3*3)
Photon emission for (n,he3*4)
JEFF-3.1 TC-99
Photon emission for (n,he3*5)
JEFF-3.1 TC-99
Photon emission for (n,he3*c)
JEFF-3.1 TC-99
Photon emission for (n, a*1)
JEFF-3.1 TC-99
Photon emission for \( (n,a^*2) \)
JEFF-3.1 TC-99
Photon emission for (n,a*3)
JEFF-3.1 TC-99
Photon emission for (n,a*4)
JEFF-3.1 TC-99
Photon emission for (n,a*5)
JEFF-3.1 TC-99
Photon emission for (n,a*6)
JEFF-3.1 TC-99
Photon emission for (n,a*7)
JEFF-3.1 TC-99
Photon emission for (n,a*8)
JEFF-3.1 TC-99
Photon emission for (n,a*9)
JEFF-3.1 TC-99
Photon emission for (n,a*10)
JEFF-3.1 TC-99
Photon emission for (n,a*\textit{c})
JEFF-3.1 TC-99
thermal capture photon spectrum
JEFF-3.1 TC-99
14 MeV photon spectrum
JEFF-3.1 TC-99
Particle heating contributions

Energy (MeV)

MeV/collision

0 50 100 150 200

protons

deuterons

tritons

he-3

alphas

0 2 4 6 8 10 12 14 16 18 20

0 50 100 150 200
JEFF-3.1 TC-99
Recoil Heating

![Graph showing recoil heating as a function of energy (MeV)].

- **Energy (MeV)**: The x-axis represents energy in MeV, ranging from 0 to 200.
- **Heating (MeV/reaction)**: The y-axis represents heating in MeV per reaction, ranging from 0 to 1.0.

The graph illustrates the recoil heating as a reaction to energy input, with notable increments at specific energy levels.
JEFF-3.1 TC-99
Particle production cross sections

Cross section (barns)

Energy (MeV)

protons
deuterons
tritons
he-3
alphas
JEFF-3.1 TC-99
protons from (n,x)
JEFF-3.1 TC-99
protons from \((n,n^*)p\)
JEFF-3.1 TC-99
protons from (n,2np)
JEFF-3.1 TC-99
protons from (n,2p)
JEFF-3.1 TC-99 protons from (n,pa)
JEFF-3.1 TC-99
angular distribution for (n,p*0) proton
JEFF-3.1 TC-99
angular distribution for (n,p*1) proton
JEFF-3.1 TC-99
angular distribution for (n,p^2) proton
JEFF-3.1 TC-99
angular distribution for (n,p*3) proton

Probl/Cos

10^0

10^-1

Energy (MeV)

1.0 0.5 0.0 -0.5 -1.0

Cosine

16 18 20

1.0 0.5 0.0 -0.5 -1.0

0 4 6 8 10 12 14
JEFF-3.1 TC-99
angular distribution for (n,p*4) proton
JEFF-3.1 TC-99
angular distribution for (n,p*5) proton
JEFF-3.1 TC-99
angular distribution for (n,p*6) proton
JEFF-3.1 TC-99
angular distribution for (n,p*7) proton

Probl/Cos

10.0

10.1

10.2

10.3

10.4

Energy (MeV)

Cosine

0

-0.5

-1.0

4

6

8

10

12

14

16

18

20
JEFF-3.1 TC-99
angular distribution for (n,p*8) proton
JEFF-3.1 TC-99
angular distribution for (n,p*9) proton
JEFF-3.1 TC-99
angular distribution for (n,p*10) proton
JEFF-3.1 TC-99
protons from (n,p*c)
JEFF-3.1 TC-99
deuterons from (n,x)
JEFF-3.1 TC-99
deuterons from (n,n*)d
JEFF-3.1 TC-99
angular distribution for (n,d*0) deuteron
JEFF-3.1 TC-99
angular distribution for (n,d*1) deuteron
JEFF-3.1 TC-99
angular distribution for (n,d*2) deuteron
JEFF-3.1 TC-99
angular distribution for (n,d$^*$3) deuteron
JEFF-3.1 TC-99
angular distribution for (n,d*4) deuteron
JEFF-3.1 TC-99
angular distribution for (n,d*5) deuteron
JEFF-3.1 TC-99
deuterons from (n,d*c)
JEFF-3.1 TC-99
tritons from \( (n,x) \)
JEFF-3.1 TC-99 tritons from \((n, n^*)t\)
JEFF-3.1 TC-99
angular distribution for (n,t*0) triton
JEFF-3.1 TC-99
angular distribution for (n,t*1) triton
JEFF-3.1 TC-99
angular distribution for (n,t*2) triton
JEFF-3.1 TC-99
angular distribution for (n,t*3) triton
JEFF-3.1 TC-99
angular distribution for (n,t*4) triton
JEFF-3.1 TC-99
angular distribution for (n,t*5) triton
JEFF-3.1 TC-99
tritons from \((n,t^*c)\)
JEFF-3.1 TC-99
he3s from (n,x)
JEFF-3.1 TC-99
angular distribution for \((n,^3\text{He}^*0)\) \(^3\text{He}\)
JEFF-3.1 TC-99
angular distribution for \( (n,\text{he}3^*1) \) 3he
JEFF-3.1 TC-99
angular distribution for (n,he3*2) 3he
JEFF-3.1 TC-99
angular distribution for (n,he3*3) 3he
JEFF-3.1 TC-99
angular distribution for (n,he3*4) 3he
JEFF-3.1 TC-99
angular distribution for (n,he3*5) 3he
JEFF-3.1 TC-99
he3s from (n,he3*c)
JEFF-3.1 TC-99
alphas from (n,x)
JEFF-3.1 TC-99
alphas from (n,n*)a
JEFF-3.1 TC-99
alphas from (n,2n)a
JEFF-3.1 TC-99
alphas from (n,2a)
JEFF-3.1 TC-99
alphas from (n,pa)
JEFF-3.1 TC-99
angular distribution for (n,a*0) alpha
JEFF-3.1 TC-99
angular distribution for (n,a*1) alpha
JEFF-3.1 TC-99
angular distribution for (n,a*2) alpha
JEFF-3.1 TC-99
angular distribution for (n,a*3) alpha
JEFF-3.1 TC-99
angular distribution for (n,a*4) alpha
JEFF-3.1 TC-99
angular distribution for (n,a*5) alpha
JEFF-3.1 TC-99
angular distribution for (n,a*6) alpha
JEFF-3.1 TC-99
angular distribution for (n,a*7) alpha
JEFF-3.1 TC-99
angular distribution for \((n,a^*8)\) alpha
JEFF-3.1 TC-99
angular distribution for (n,a*9) alpha
JEFF-3.1 TC-99
angular distribution for (n,a*10) alpha
JEFF-3.1 TC-99
alphas from \((n, a^* c)\)