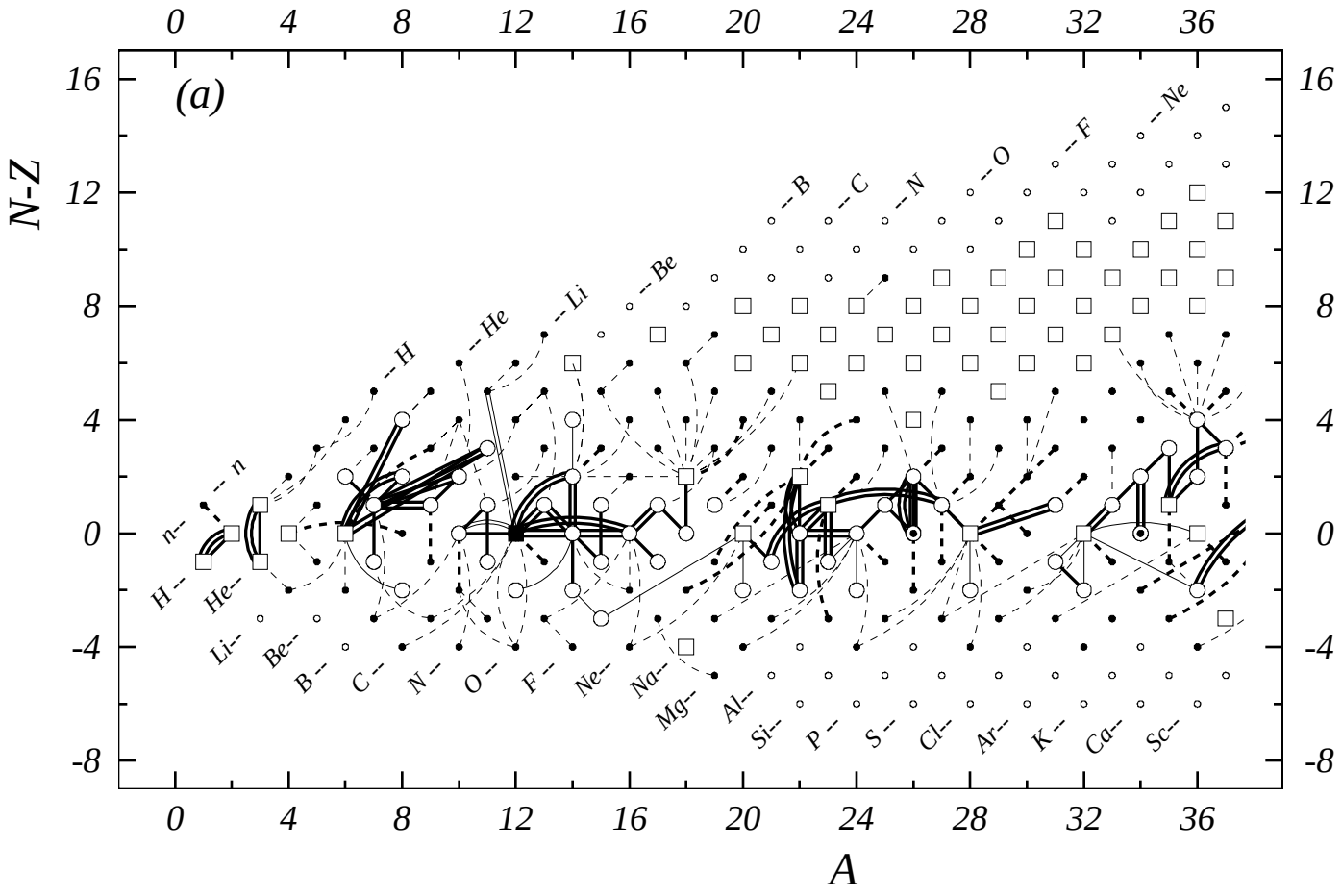
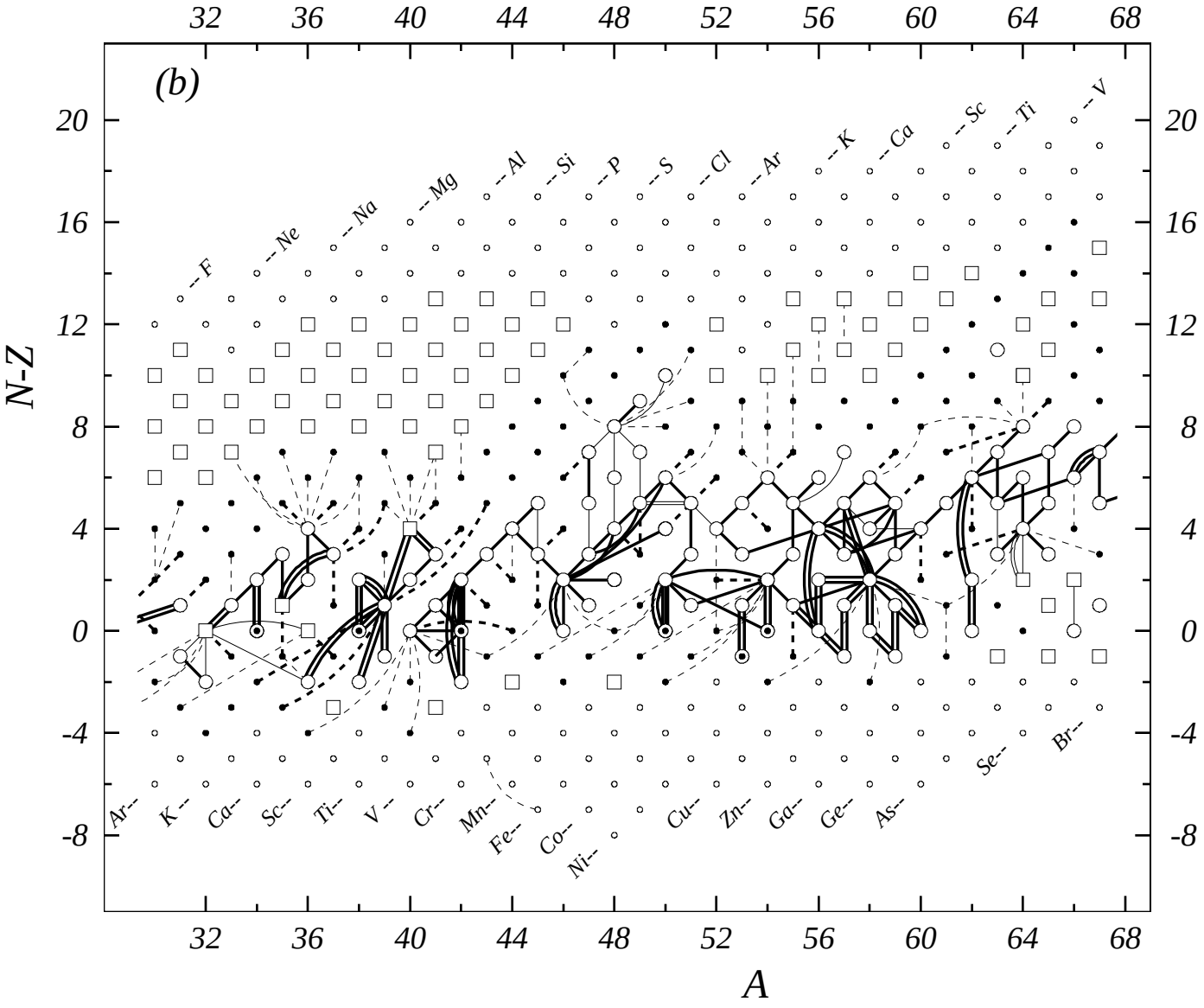
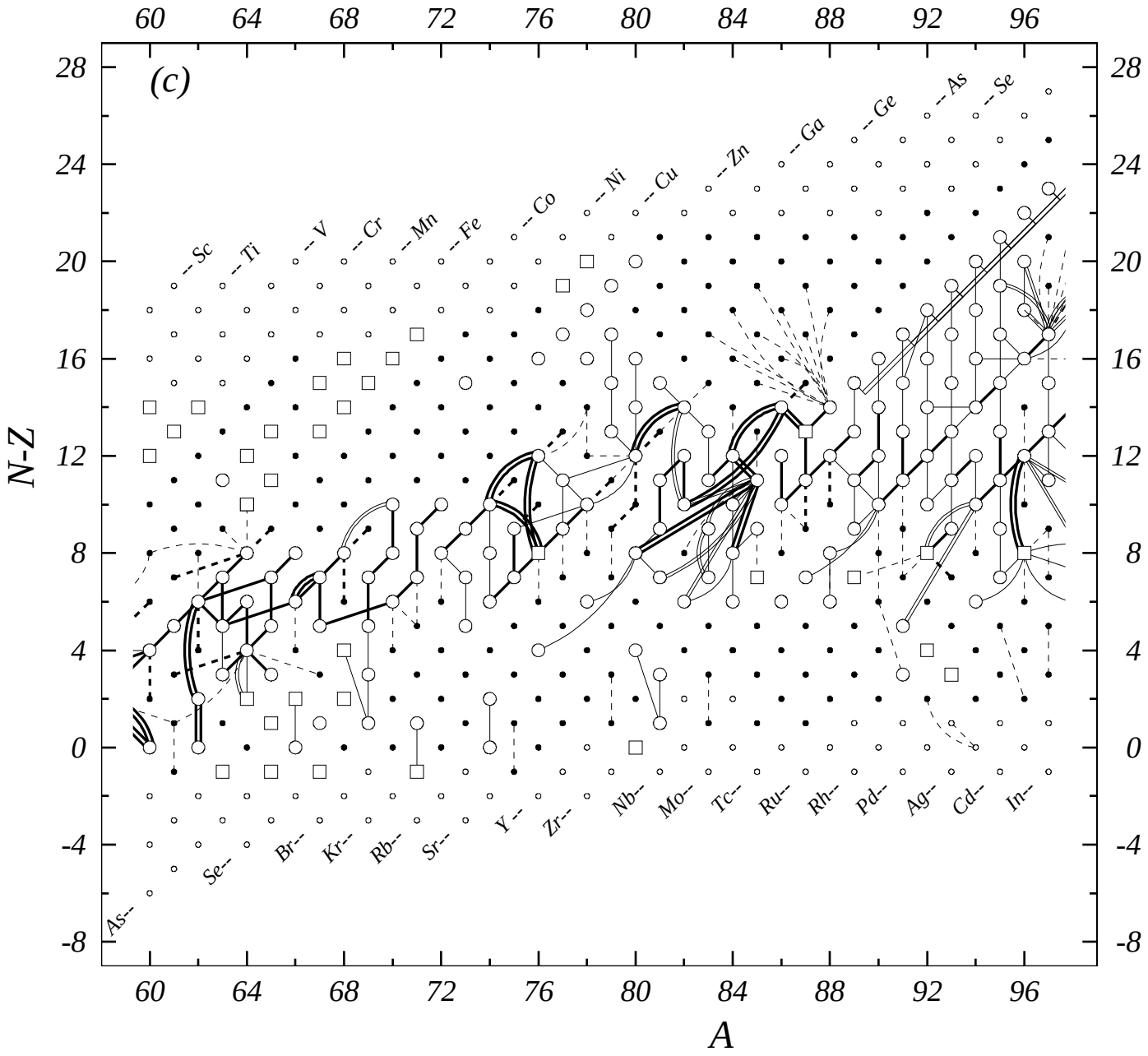
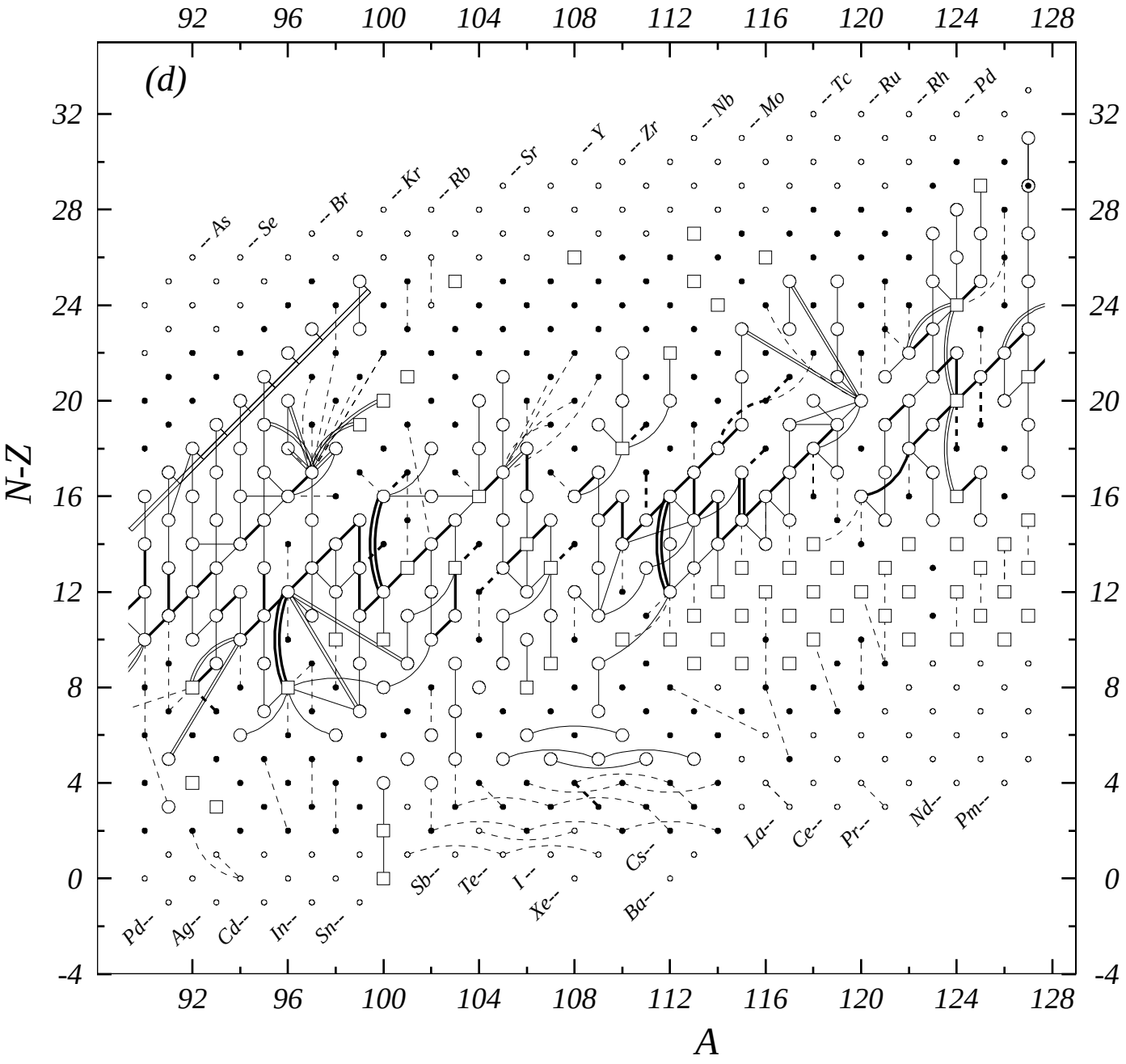
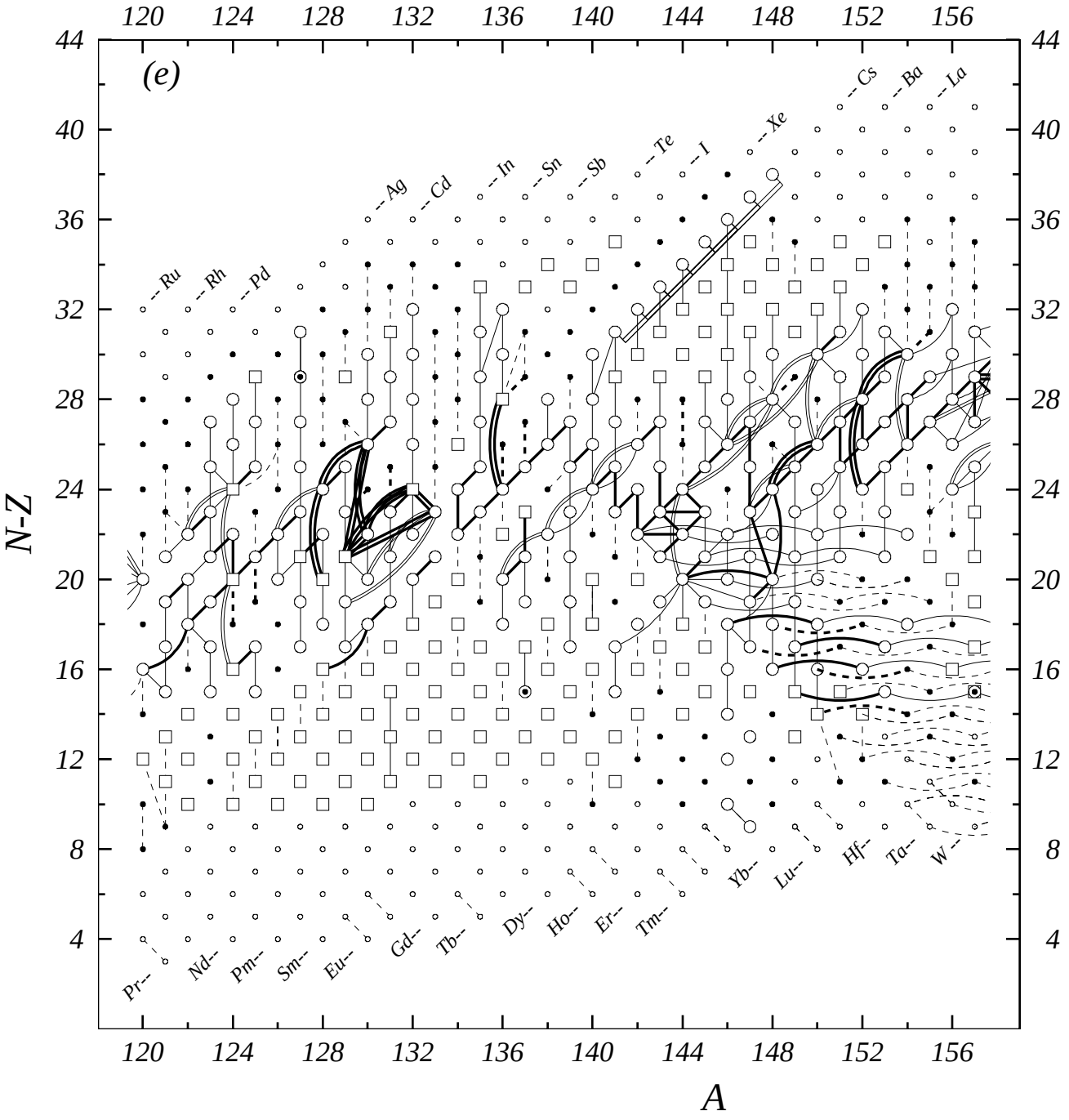
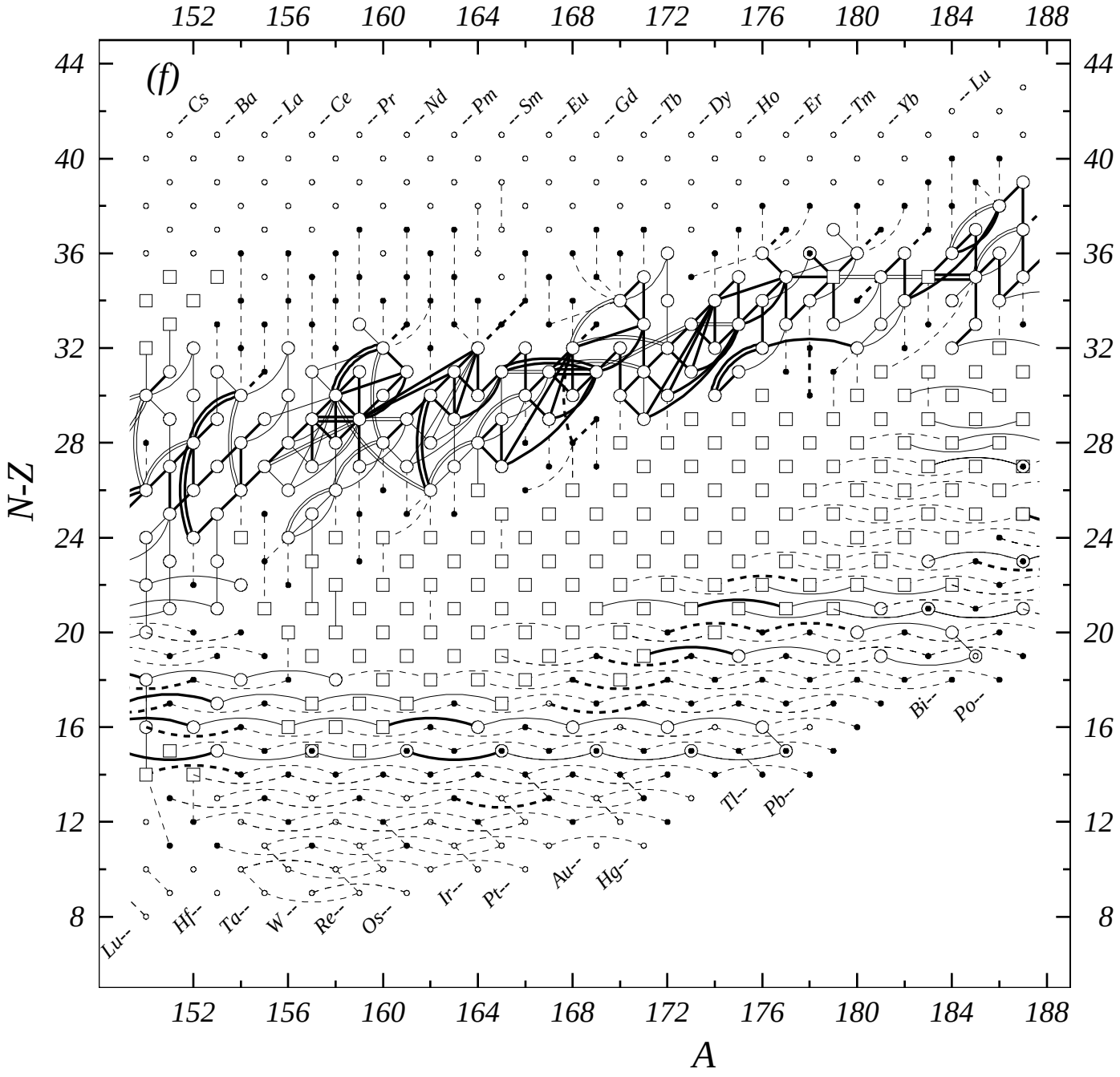

(a)
N-Z
A
0
4
8
12
16
20
24
28
32
36
-8
-4
0
4
8
12
16
n
H
He
Li
Be
B
C
N
O
F
Ne
Na
Mg
Al
Si
P
S
Cl
Ar
K
Ca
Sc


(b)
N-Z
A
32
36
40
44
48
52
56
60
64
68
20
16
12
8
4
0
-4
-8
F
Ne
Na
Mg
Al
Si
P
S
Cl
Ar
K
Ca
Sc
Ti
V
Ar
K
Ca
Sc
Ti
V
Cr
Mn
Fe
Co
Ni
Cu
Zn
Ga
Ge
As
Se
Br


(c)
N-Z
A
Sc
Ti
V
Cr
Mn
Fe
Co
Ni
Cu
Zn
Ga
Ge
As
Se
As--
Se--
Br--
Kr--
Rb--
Sr--
Y --
Zr--
Nb--
Mo--
Tc--
Ru--
Rh--
Pd--
Ag--
Cd--
In--


(d)
N-Z
A
92
96
100
104
108
112
116
120
124
128
-4
0
4
8
12
16
20
24
28
32
As
Se
Br
Kr
Rb
Sr
Y
Zr
Nb
Mo
Tc
Ru
Rh
Pd
Pd--
Ag--
Cd--
In--
Sn--
Sb--
Te--
I--
Xe--
Cs--
Ba--
La--
Ce--
Pr--
Nd--
Pm--


(e)
N-Z
A
120
124
128
132
136
140
144
148
152
156
4
8
12
16
20
24
28
32
36
40
44
Ru
Rh
Pd
Ag
Cd
In
Sn
Sb
Te
I
Xe
Cs
Ba
La
Pr
Nd
Pm
Sm
Eu
Gd
Tb
Dy
Ho
Er
Tm
Yb
Lu
Hf
Ta
W


(f)
Cs
Ba
La
Ce
Pr
Nd
Pm
Sm
Eu
Gd
Tb
Dy
Ho
Er
Tm
Yb
Lu
Lu--
Hf--
Ta--
W--
Re--
Os--
Ir--
Pt--
Au--
Hg--
Tl--
Pb--
Bi--
Po--
N-Z
A
152
156
160
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168
172
176
180
184
188
8
12
16
20
24
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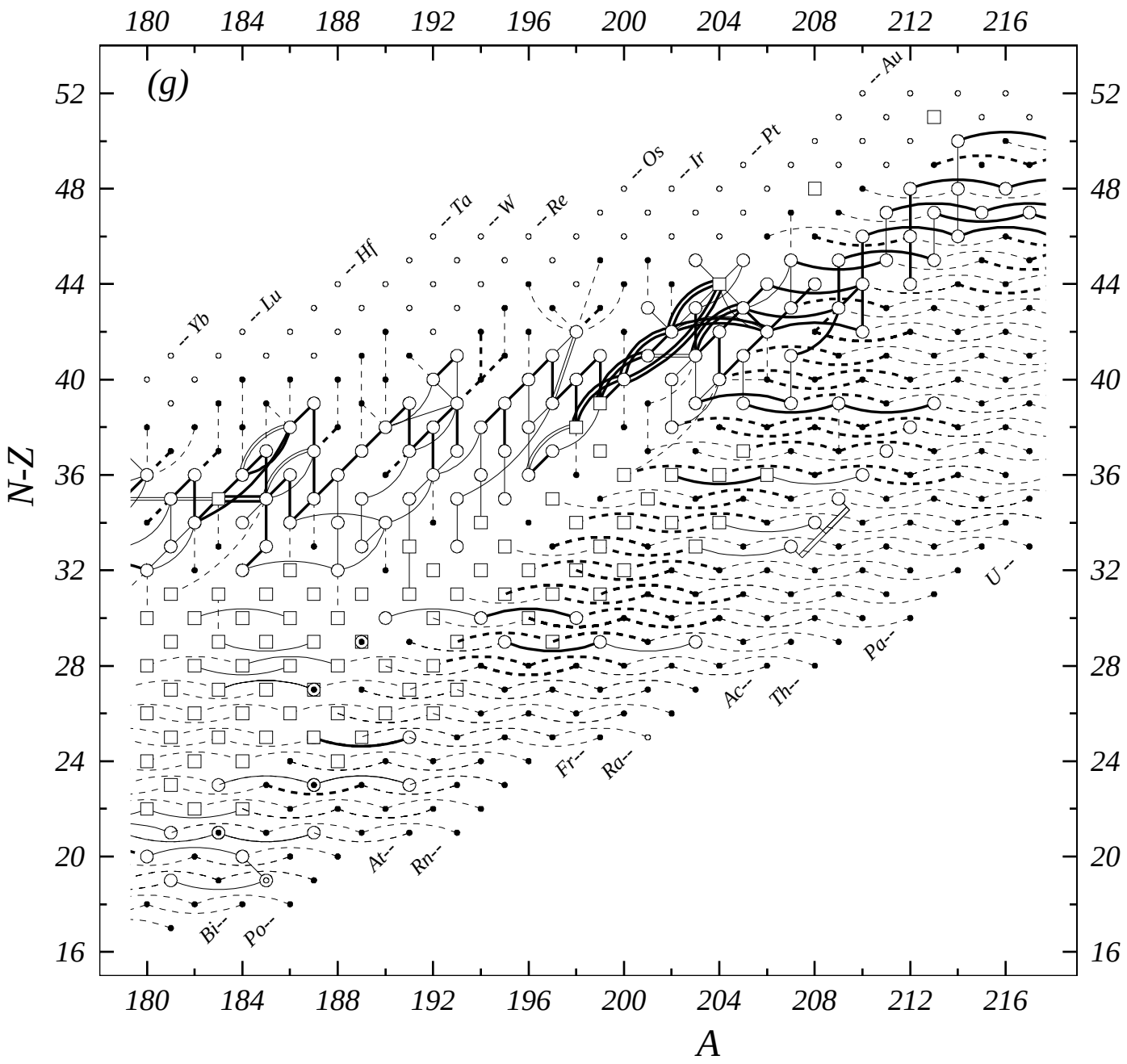
32
36
40
44


(g)
N-Z
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180
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188
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196
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204
208
212
216
16
20
24
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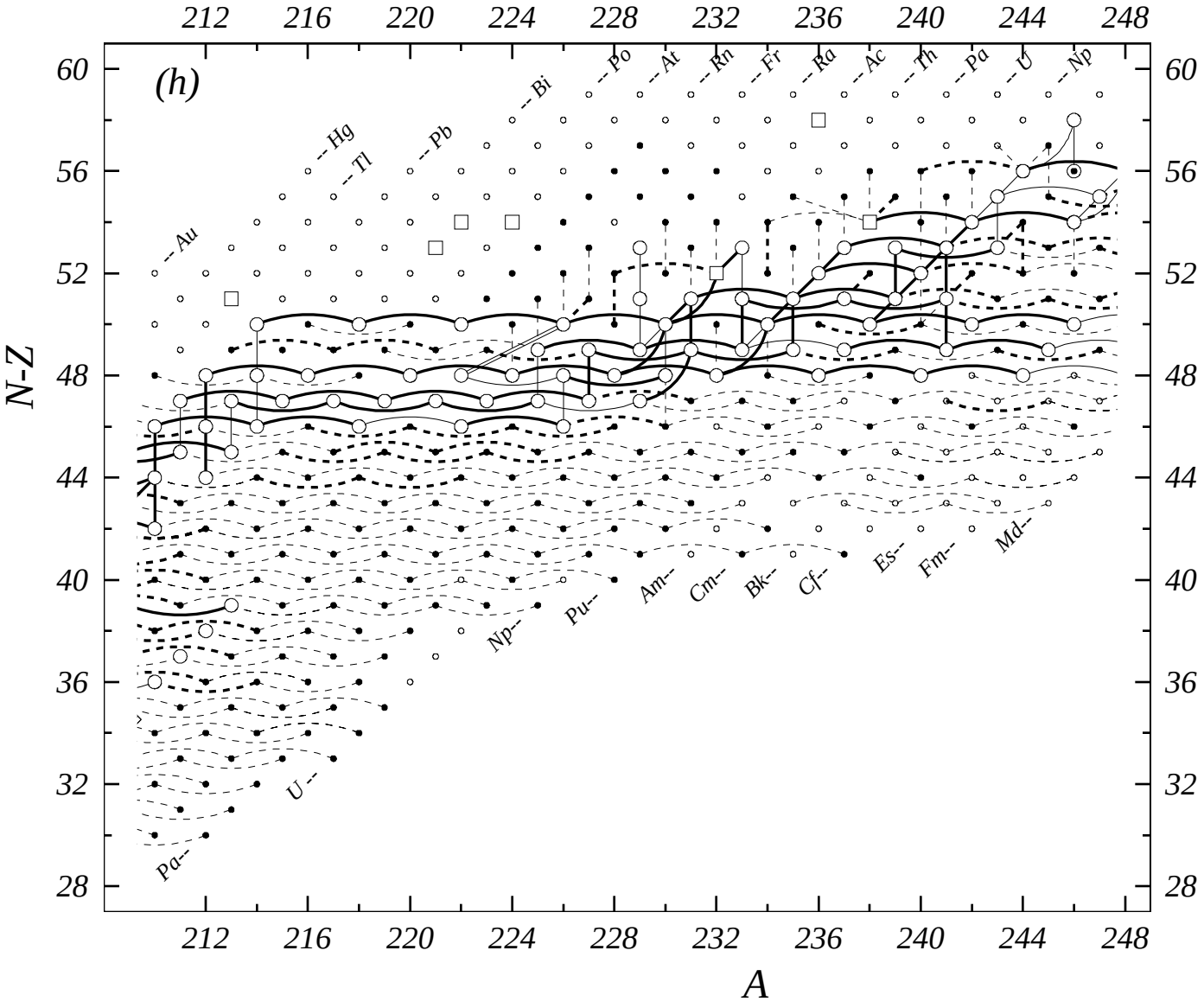
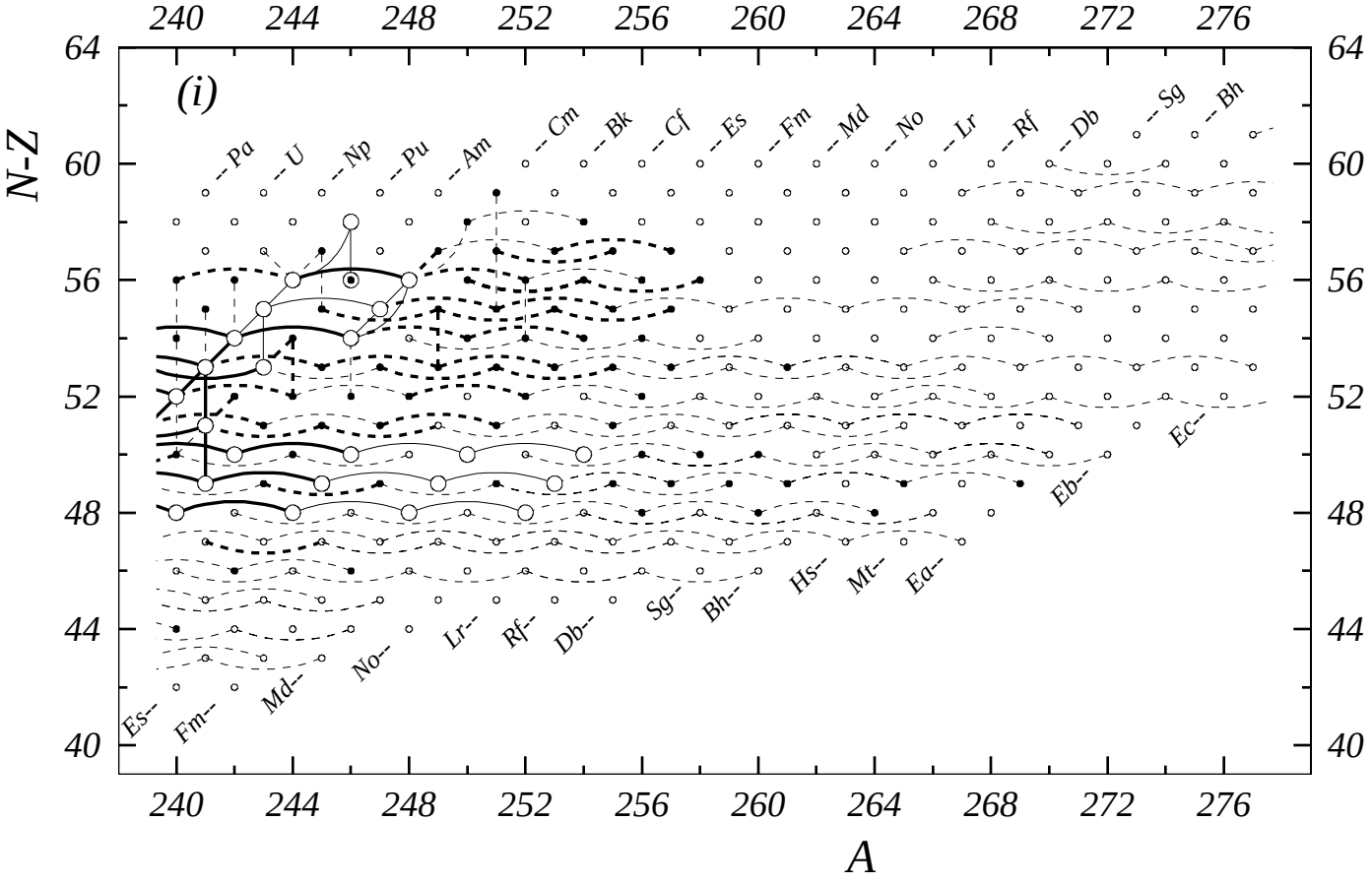
32
36
40
44
48
52
Yb
Lu
Hf
Ta
W
Re
Os
Ir
Pt
Au
Bi
Po
At
Rn
Fr
Ra
Ac
Th
Pa
U


(h)
N-Z
A
212
216
220
224
228
232
236
240
244
248
28
32
36
40
44
48
52
56
60
Au
Hg
Tl
Pb
Bi
Po
At
Rn
Fr
Ra
Ac
Th
Pa
U
Np
Pa--
U--
Np--
Pu--
Am--
Cm--
Bk--
Cf--
Es--
Fm--
Md--


(i)
N-Z
A
240
244
248
252
256
260
264
268
272
276
40
44
48
52
56
60
64
Pa
U
Np
Pu
Am
Cm
Bk
Cf
Es
Fm
Md
No
Lr
Rf
Db
Sg
Bh
Es--
Fm--
Md--
No--
Lr--
Rf--
Db--
Sg--
Bh--
Hs--
Mt--
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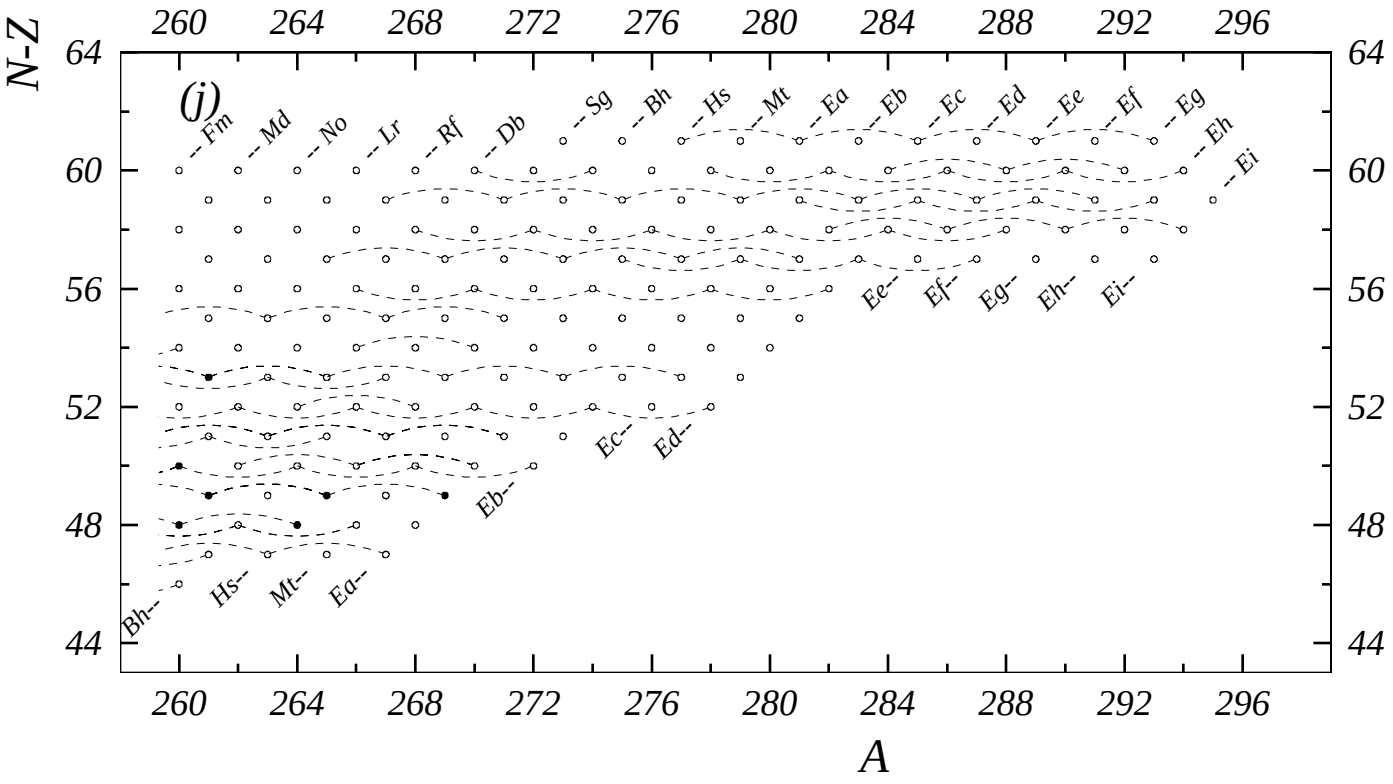
Eb--
Ec--


(j)
N-Z
A
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280
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292
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48
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60
64
Fm
Md
No
Lr
Rf
Db
Sg
Bh
Hs
Mt
Ea
Eb
Ec
Ed
Ee
Ef
Eg
Eh
Ei
Bh
Hs
Mt
Ea
Eb
Ec
Ed
Ee
Ef
Eg
Eh
Ei