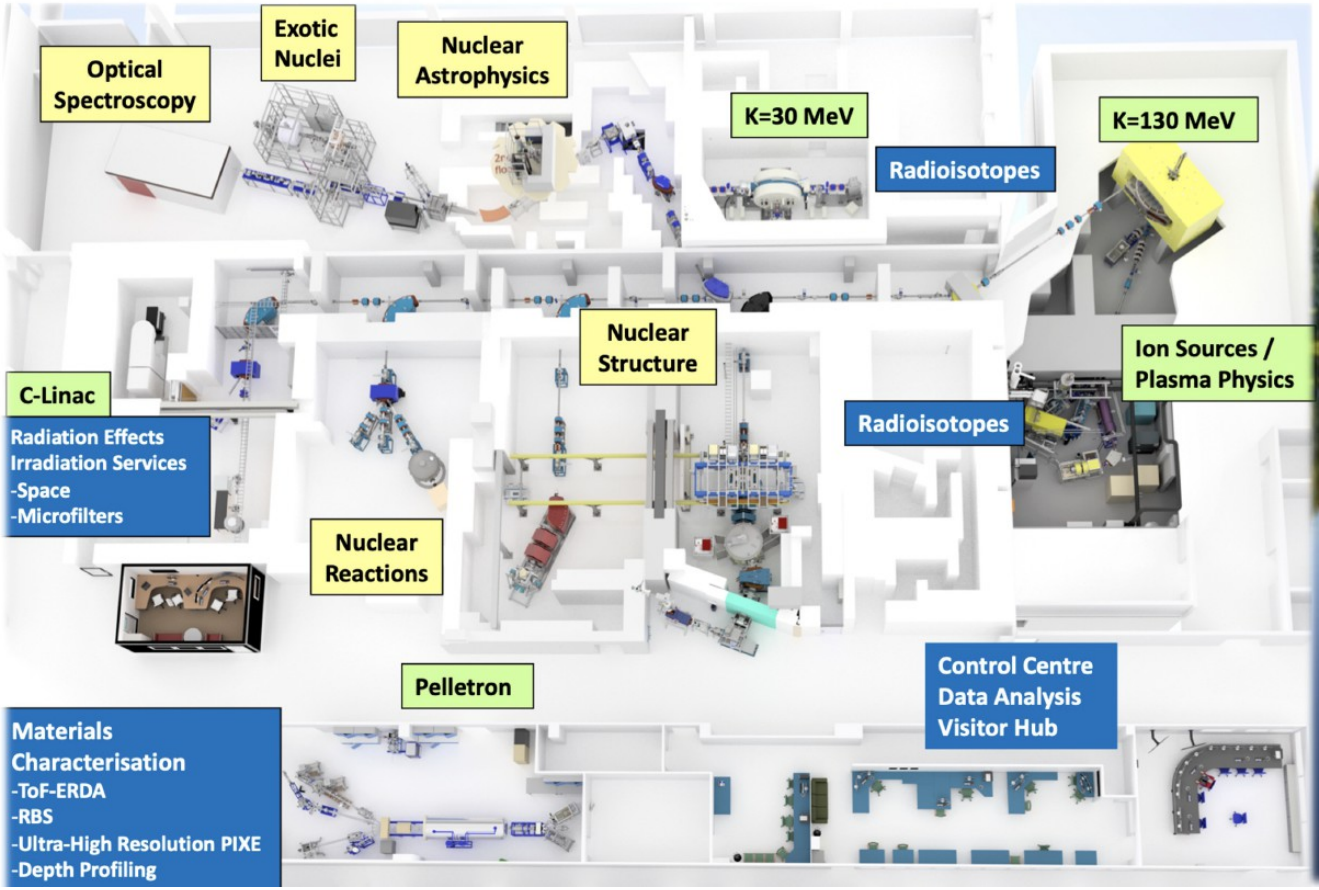
Collectivity and shape coexistence in A≈120 proton-rich nuclei

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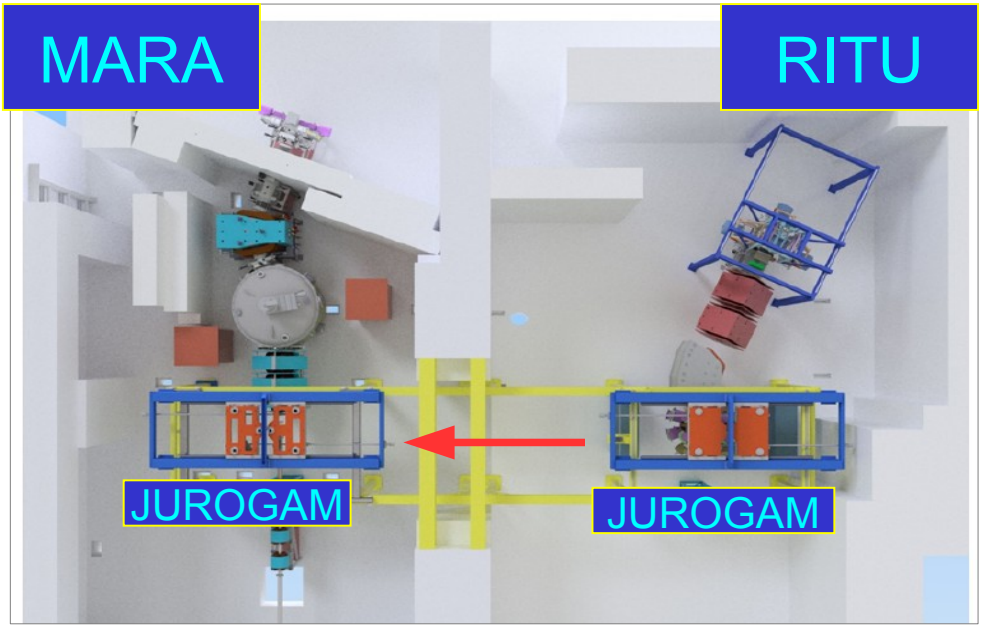




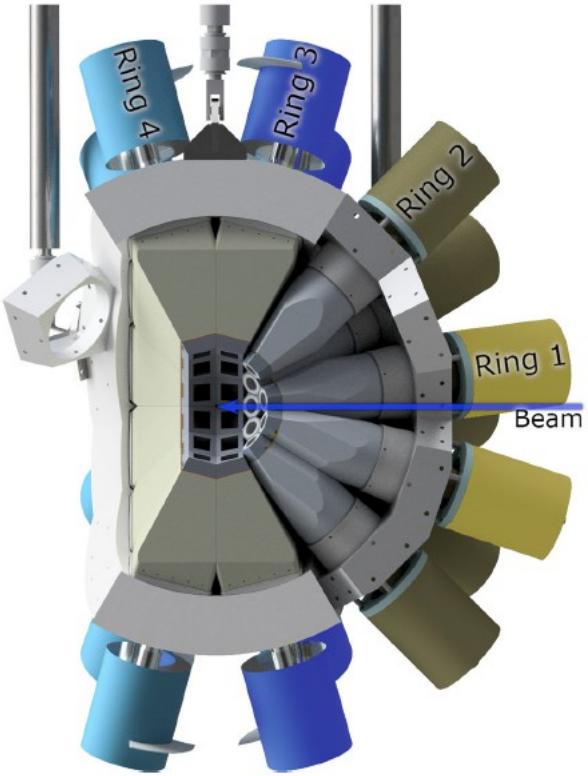
JUROGAM + MARA or RITU

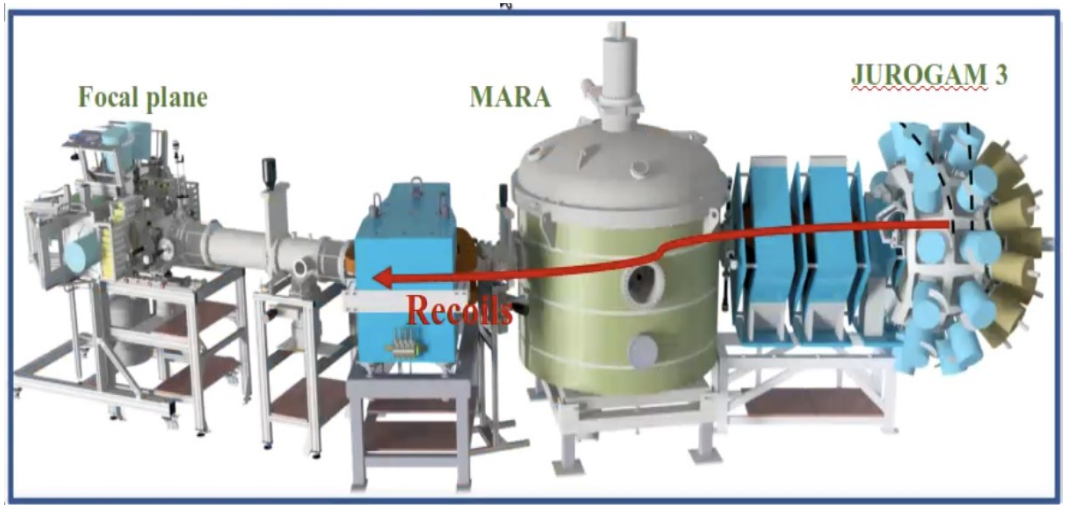
MARA

RITU

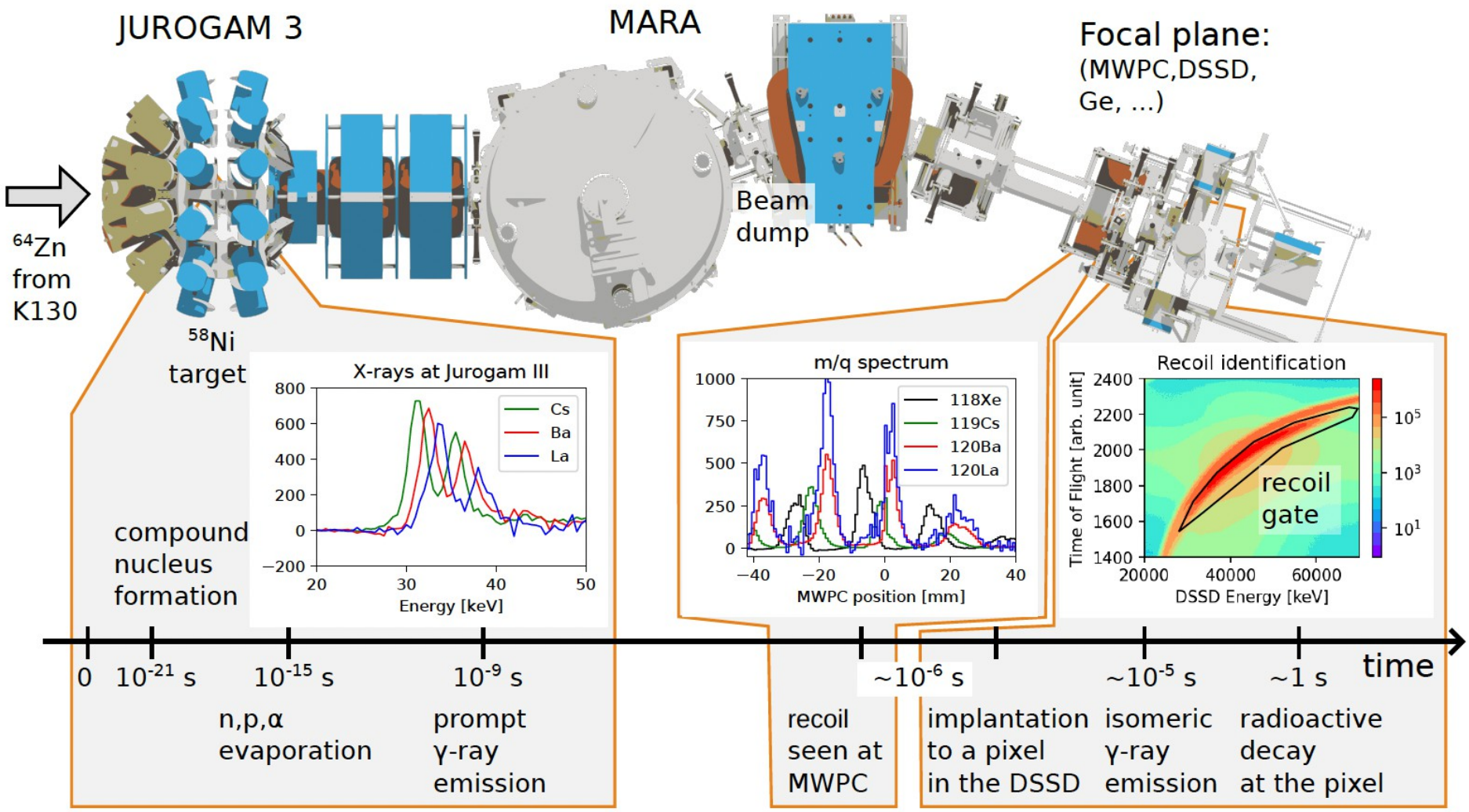


JUROGAM

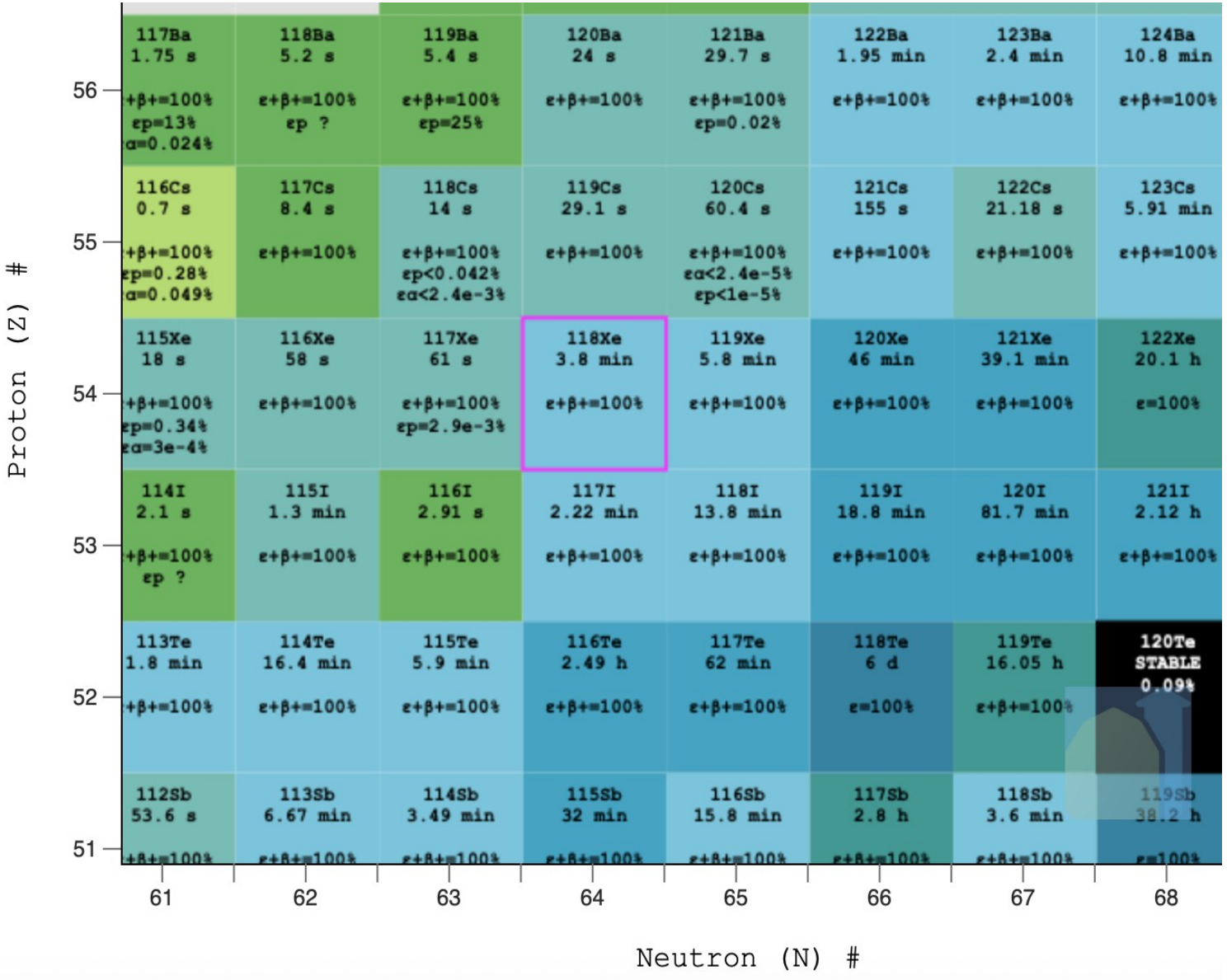




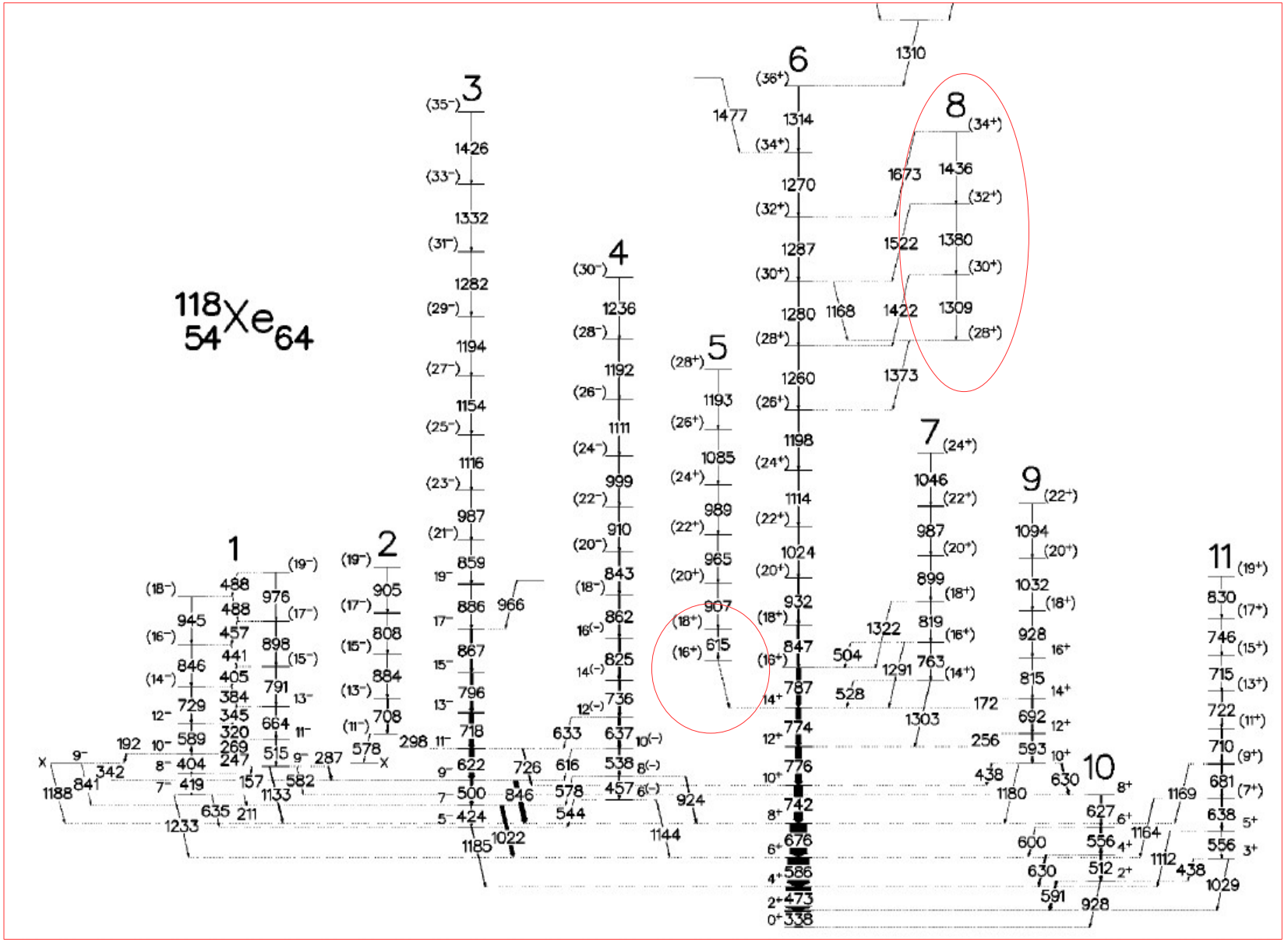
JUROGAM+MARA at Jyväskylä (^{64}Zn +^{58}Ni)



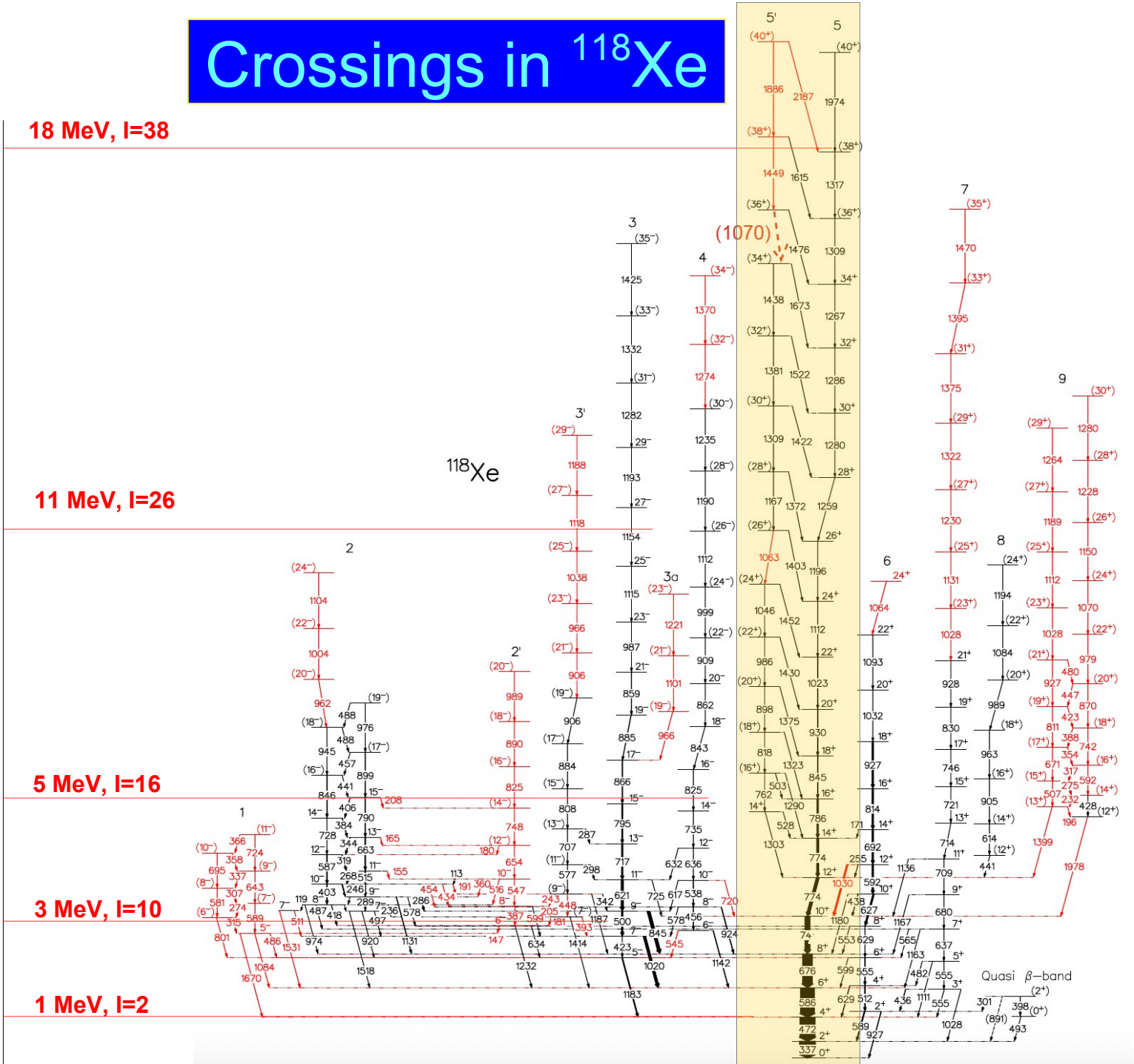
JUROGAM+MARA at Jyväskylä (^{64}Zn +^{58}Ni)



Exotic excitations, shape coexistence and band termination in ^{118}Xe

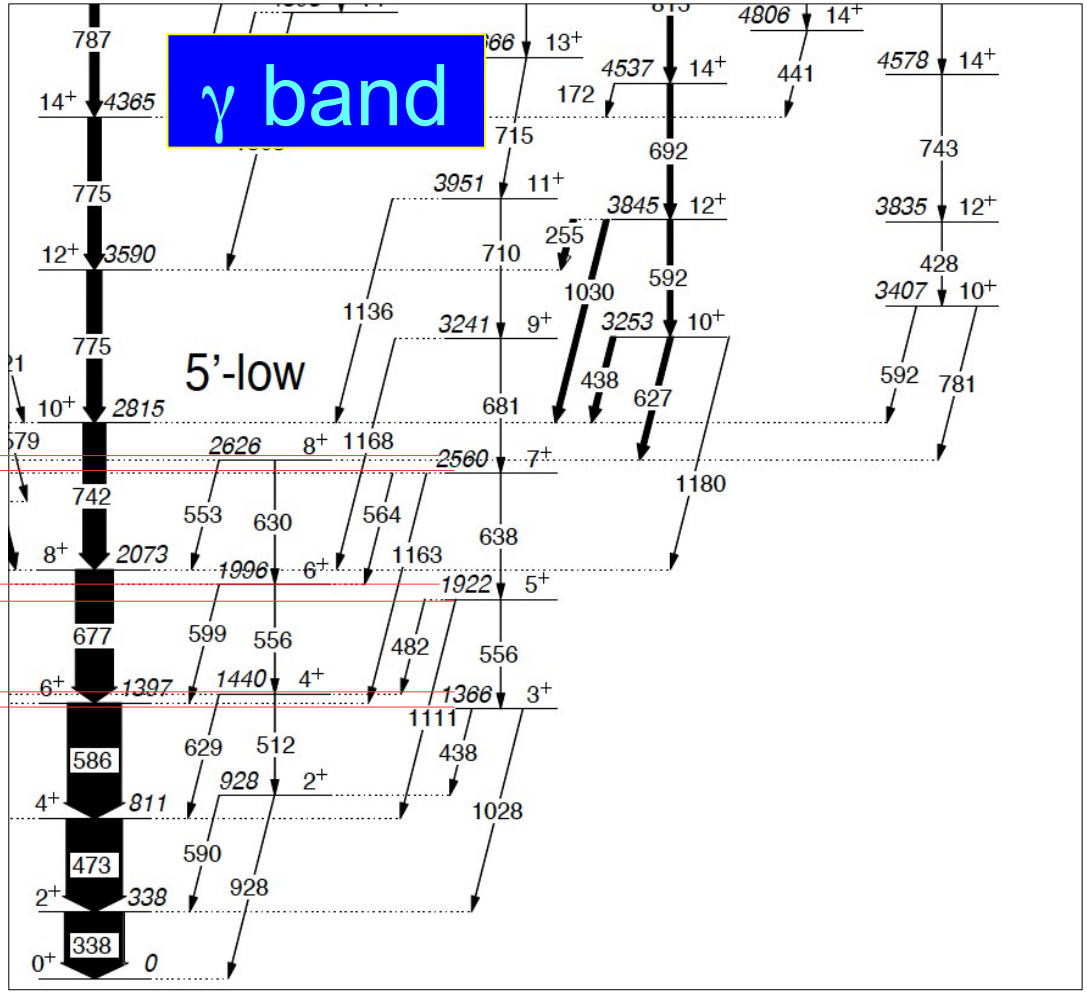


Crossings in ^{118}Xe

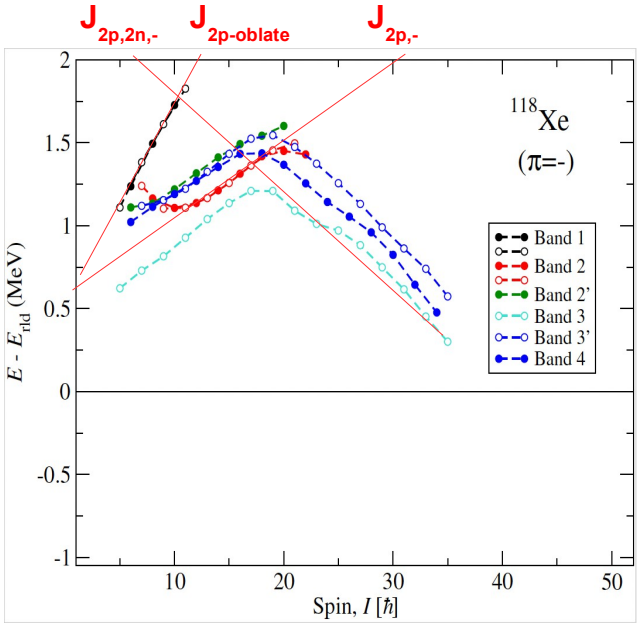


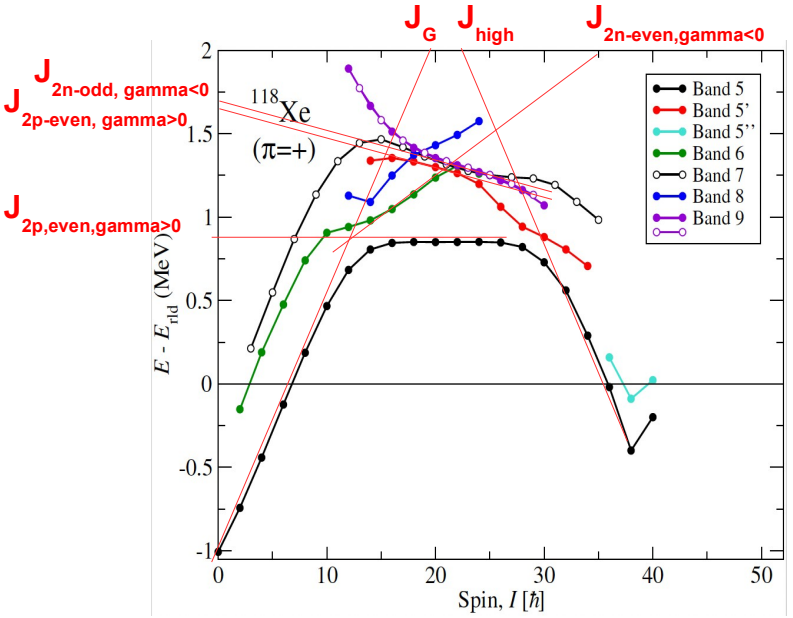
Gamma band in ^{118}Xe

Staggering =>
γ softness
γ independence

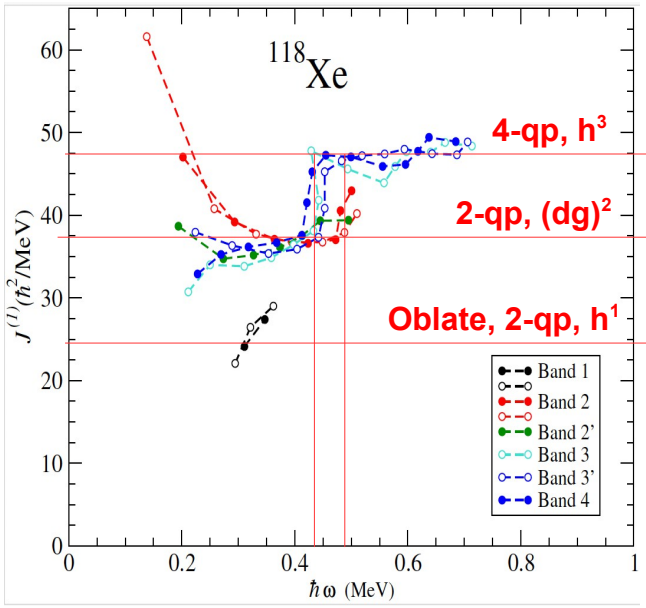


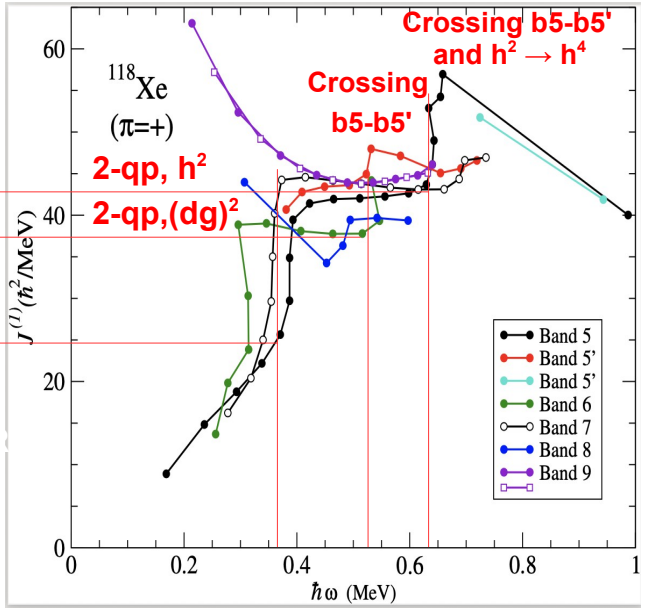
$E-E_{rld}$


J 2p,2n,-
J 2p-oblate
J 2p,-
118Xe
(π=-)
Band 1
Band 2
Band 2'
Band 3
Band 3'
Band 4
E - E_rld (MeV)
Spin, I [ħ]


J G
J high
J 2n-even,gamma<0
J 2n-odd, gamma<0
J 2p-even, gamma>0
J 2p,even,gamma>0
118Xe
(π=+)
Band 5
Band 5'
Band 5''
Band 6
Band 7
Band 8
Band 9
E - E_rld (MeV)
Spin, I [ħ]

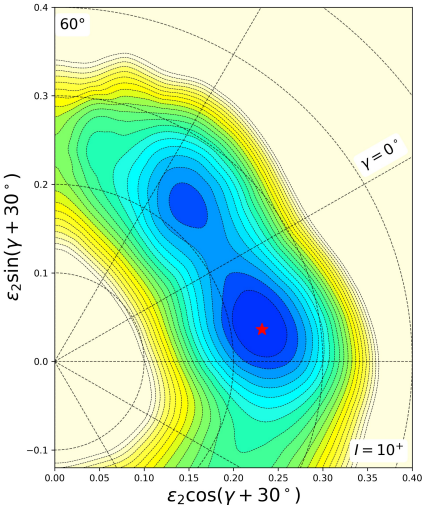
$J^{(1)}$

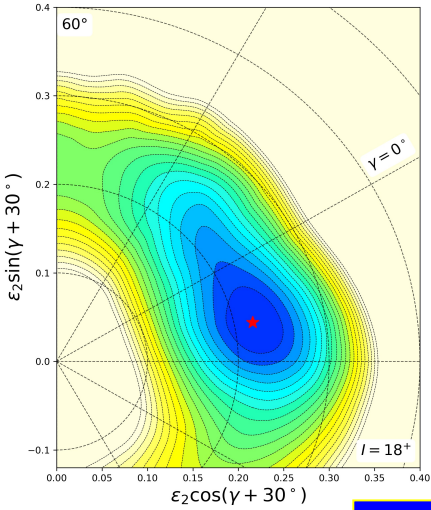

118Xe
4-qp, h3
2-qp, (dg)2
Oblate, 2-qp, h1
Band 1
Band 2
Band 2'
Band 3
Band 3'
Band 4
ħω (MeV)

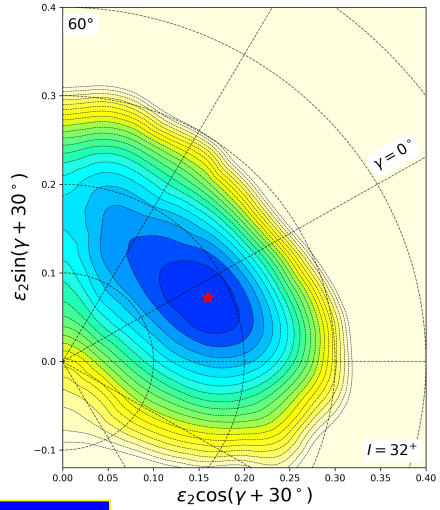

Crossing b5-b5'
and h2 → h4
Crossing
b5-b5'
118Xe
(π=+)
2-qp, h2
2-qp,(dg)2
Band 5
Band 5'
Band 5'
Band 6
Band 7
Band 8
Band 9
ħω (MeV)

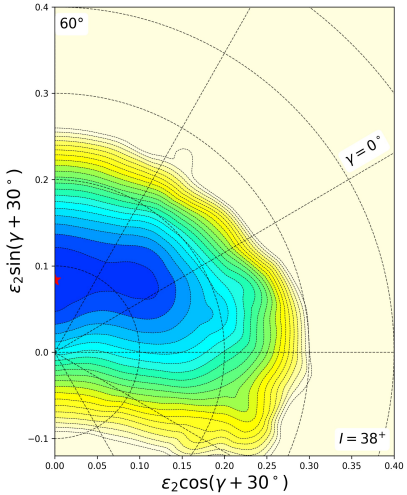
CNS deformaztions of bands 5 & 5' in ^{118}Xe

[40,A4]

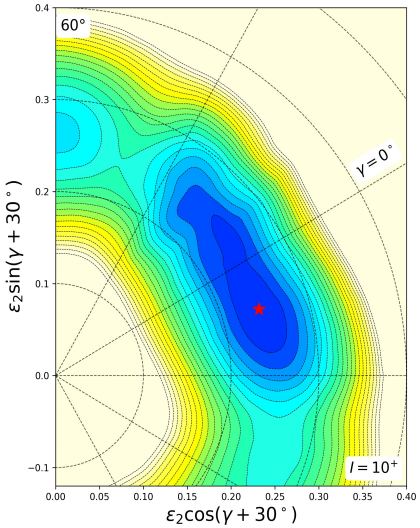


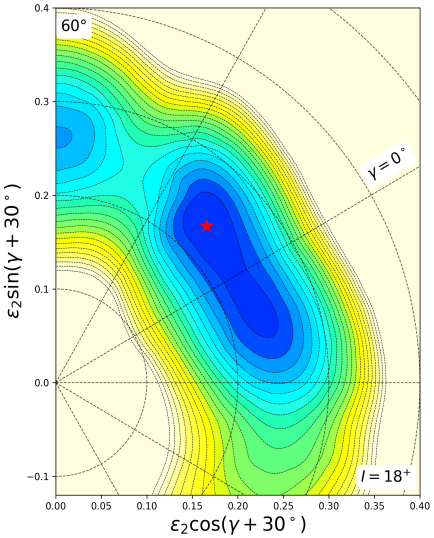


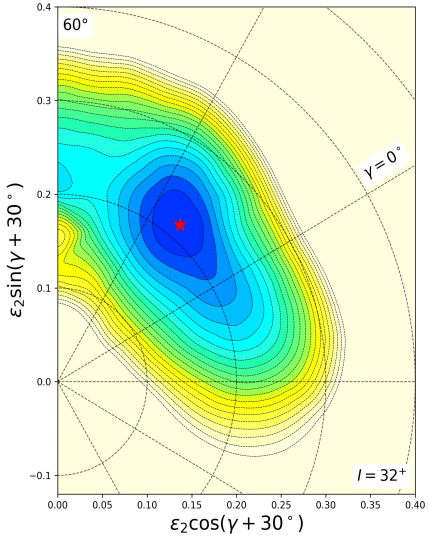


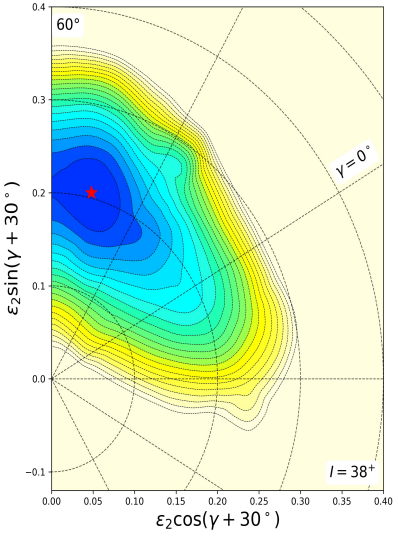


[22,A4]



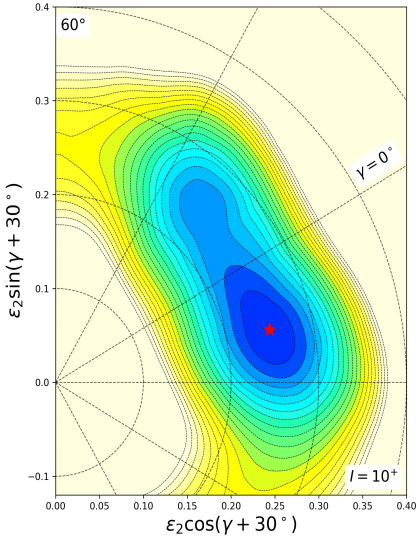


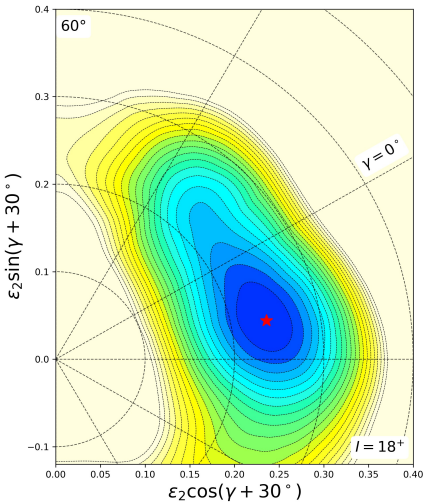


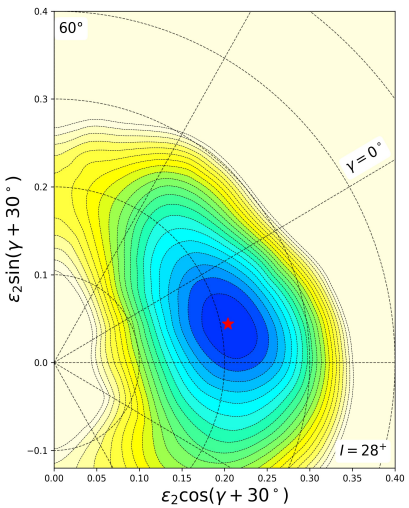


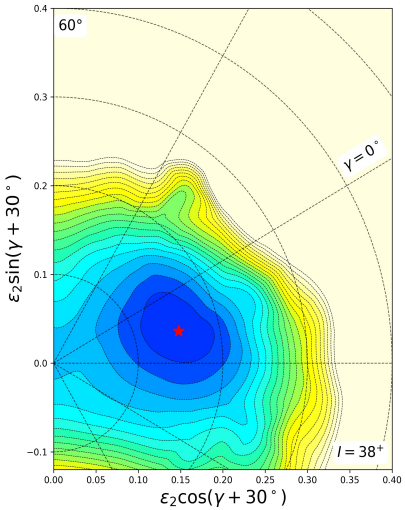
CNS deformations of bands yrast & 5 in ^{120}Xe

[40,A6]

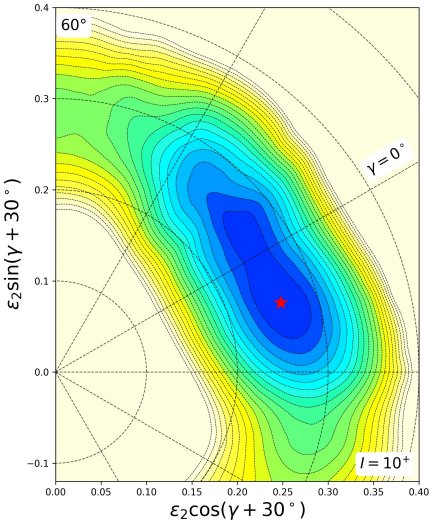


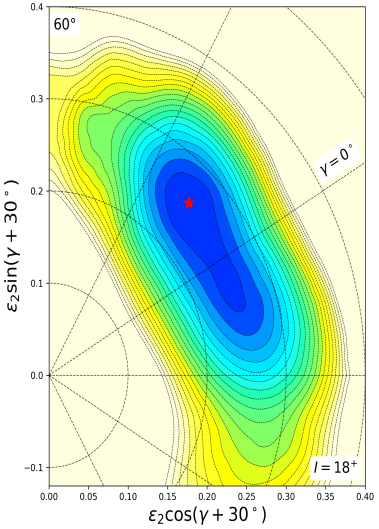


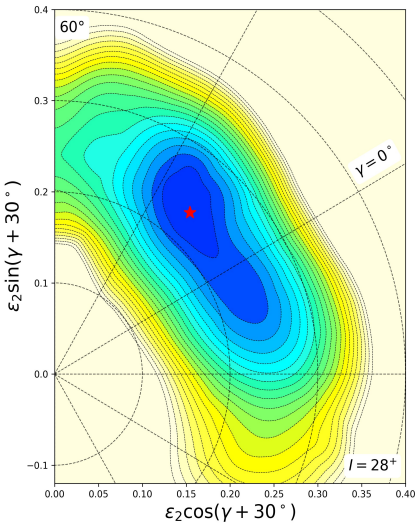


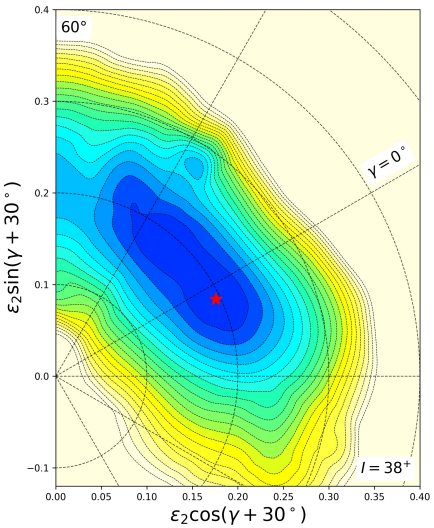


[22,A6]

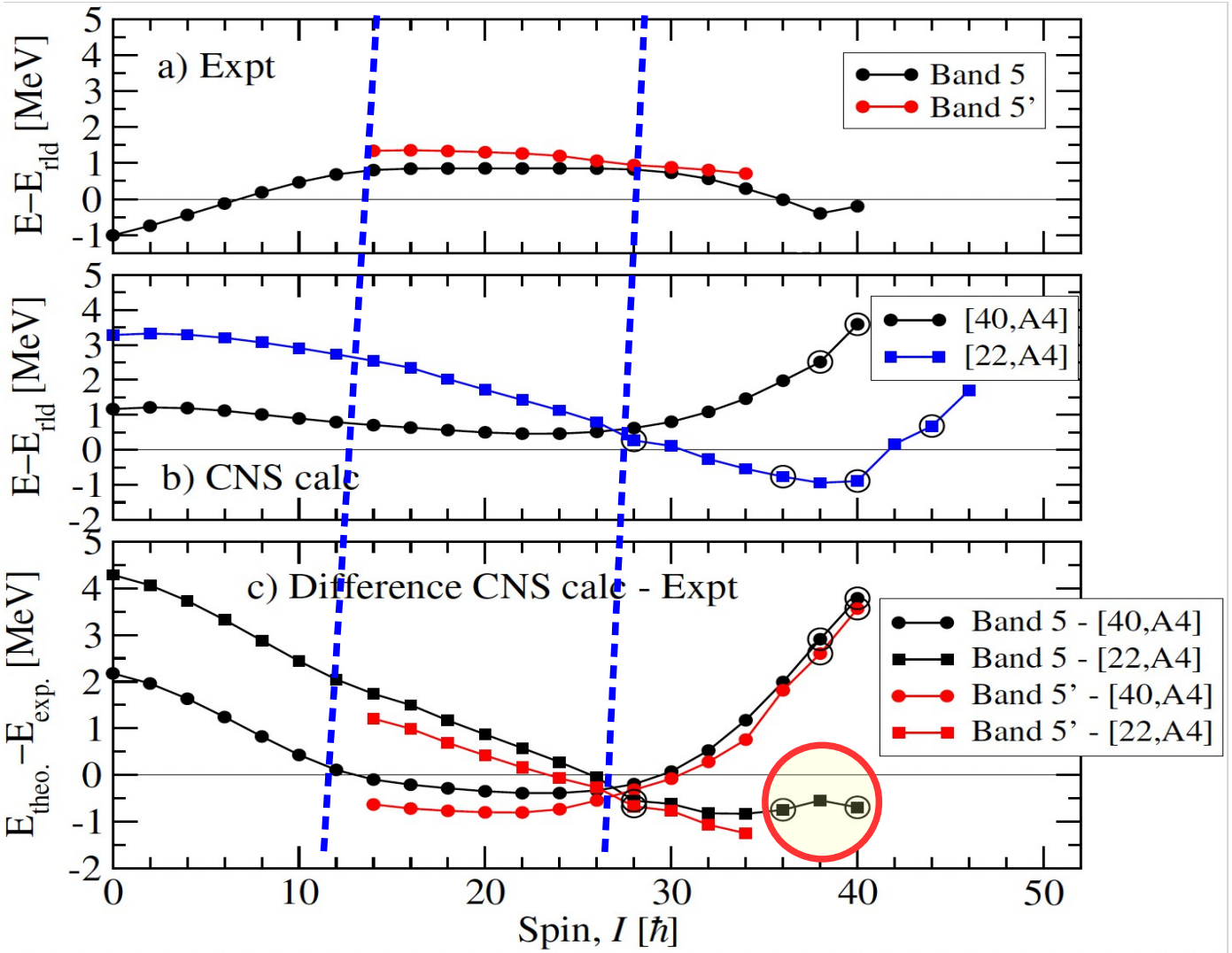




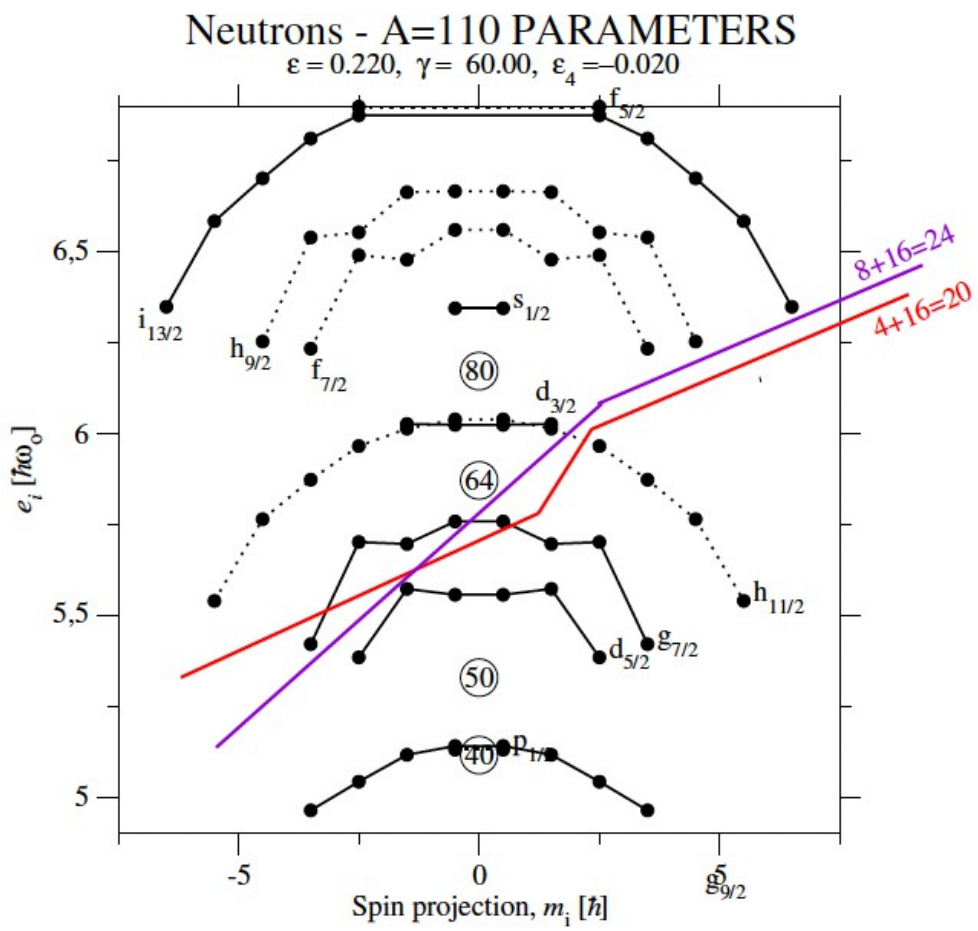




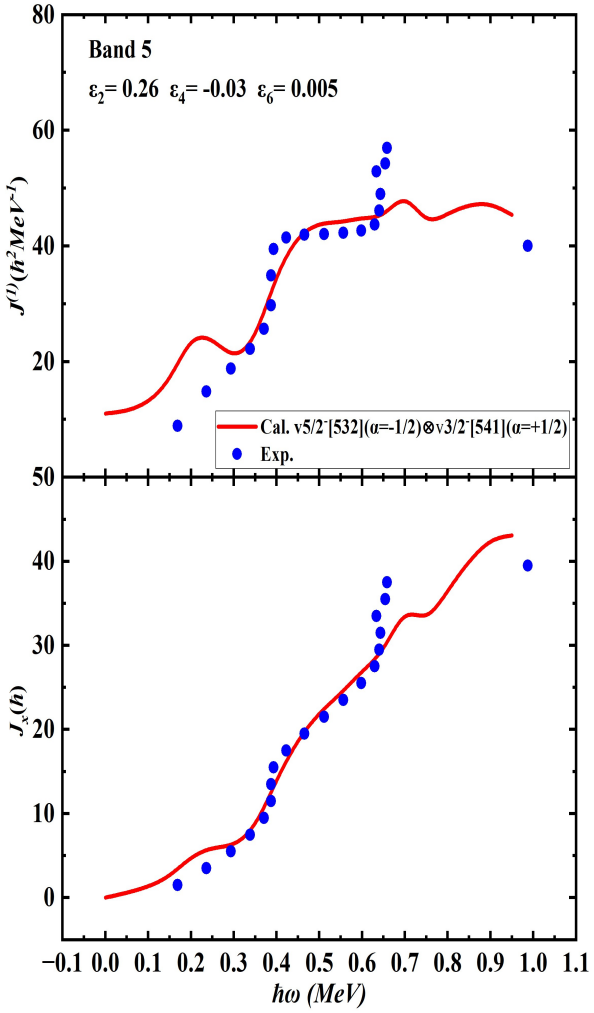
Bands 5 & 5' in ^{118}Xe

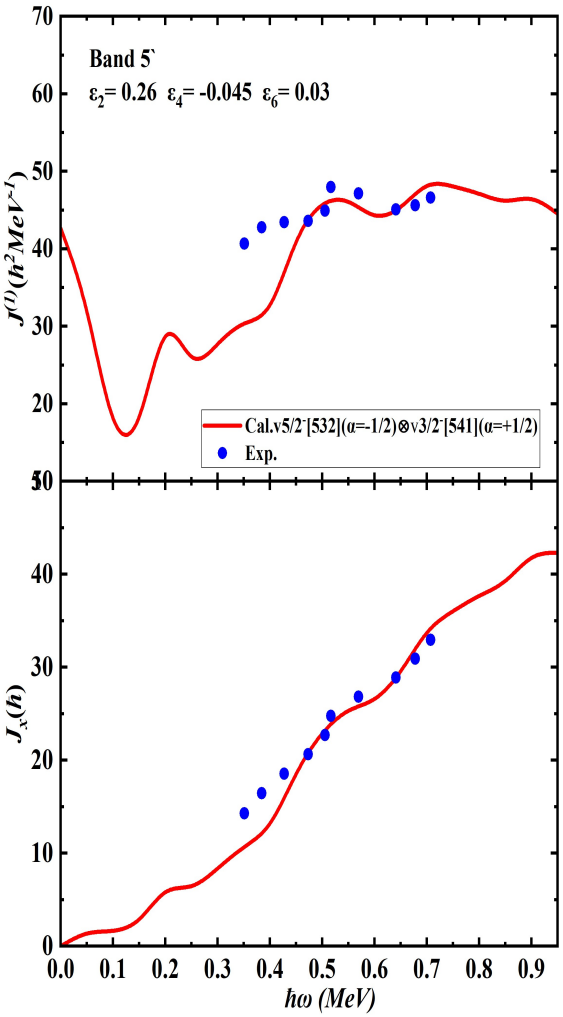


Terminating and maximum aligned states in ^{118}Xe



Particle Number Conserving – Cranked Shell Model (PNC-CSM)





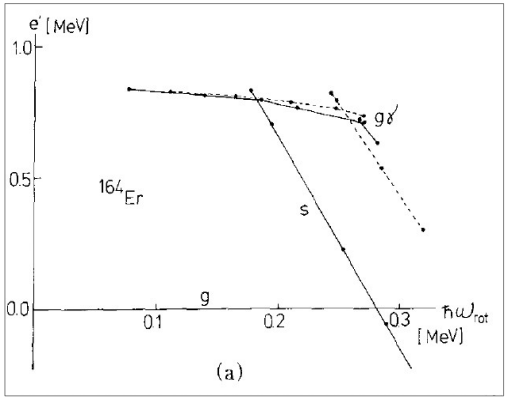
Sγ bands in ^{164}Er (axial) & ^{182}Os (triaxial)

Progress of Theoretical Physics, Vol. 70, No. 1, July 1983

An Extension of the Rotating Shell Model and Its Application to ^{164}Er

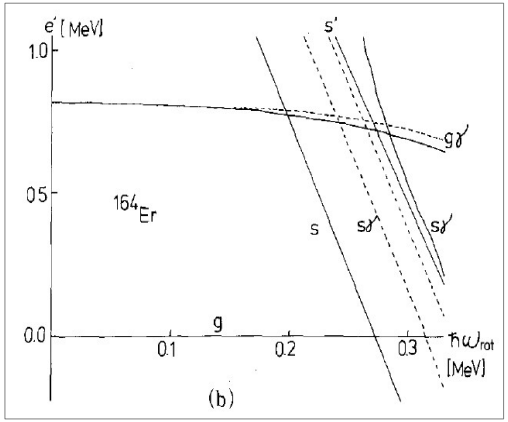
Yoshifumi R. SHIMIZU and Kenichi MATSUYANAGI

Exp



RPA

β=0.27
γ=0°



GAMMA VIBRATION AND WOBBLING MOTION IN ^{182}Os

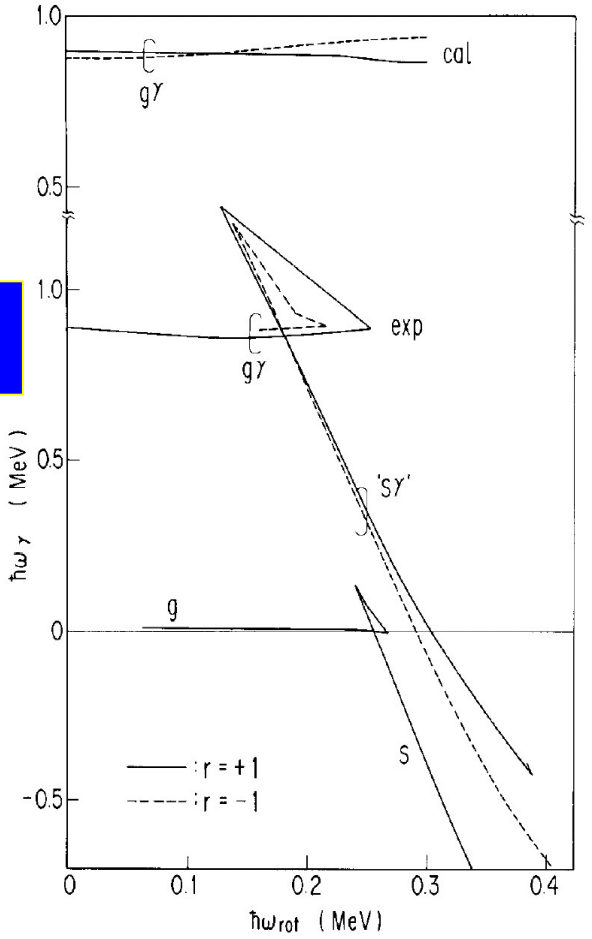
Nuclear Physics A509 (1990) 269–286

Masayuki MATSUZAKI

Exp

RPA

β=0.22
γ=-20°



Shape coexistence in ^{118}Xe

prolate

oblate

New

New

$\pi(g_{9/2})^{-1}(h_{11/2})^{1} \otimes \nu(g_{7/2})^{1}(h_{11/2})^{1}$

$\pi(g_{9/2})^{-1}(h_{11/2})^{1}$

$\pi(\Gamma_{11/2})^{1}(g_{7/2})^{1}$

R

j

R

j2

j1

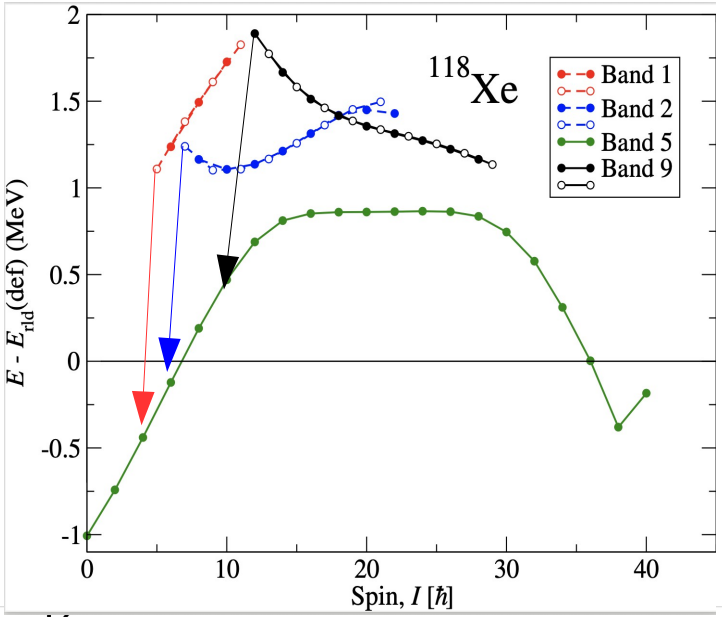
R

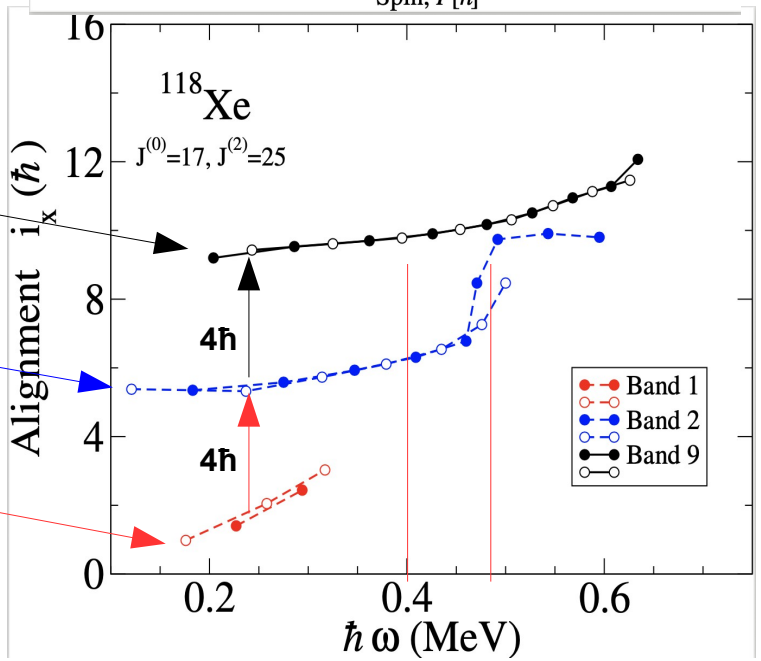
j1+j2

5 MeV

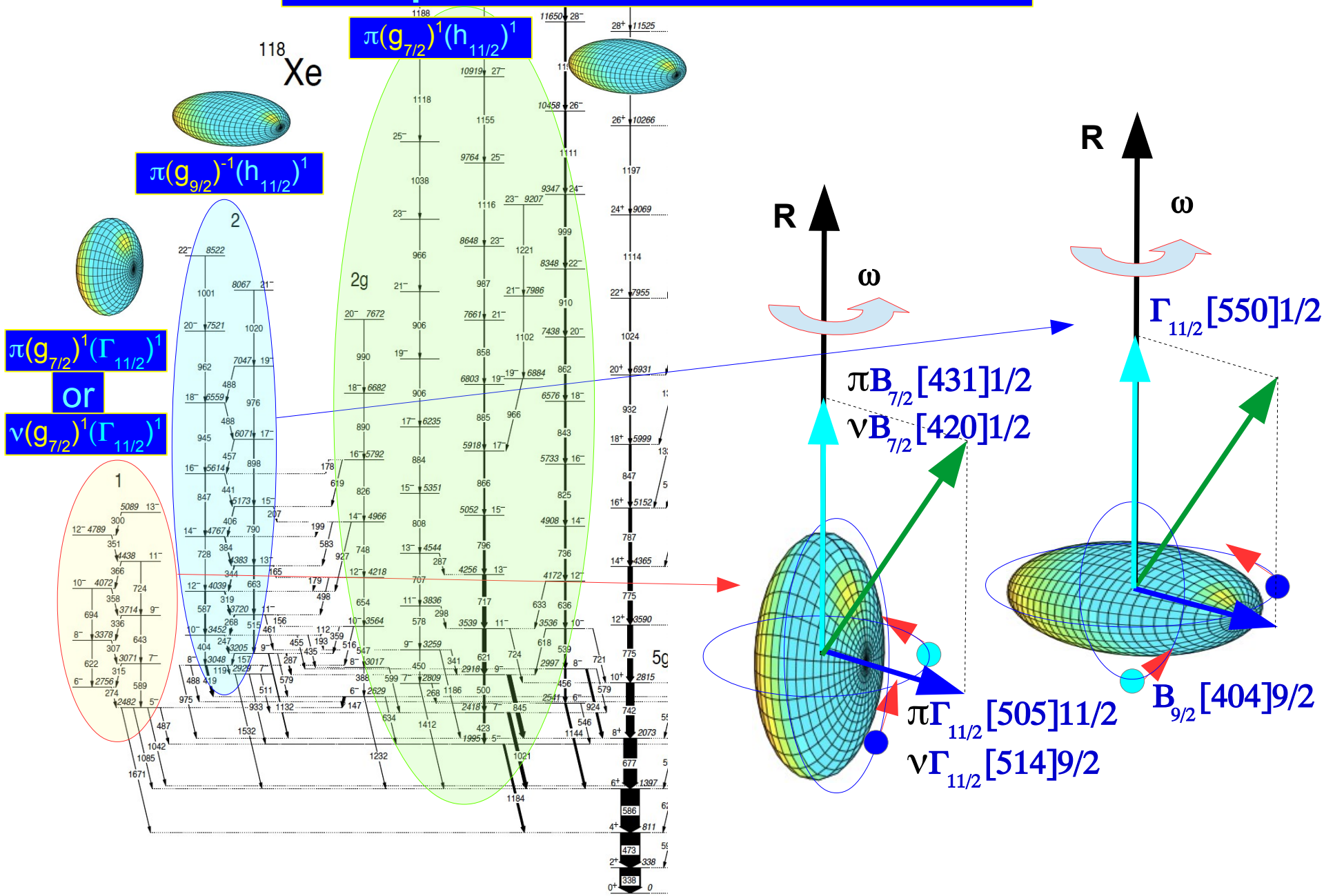
3 MeV

2.5 MeV

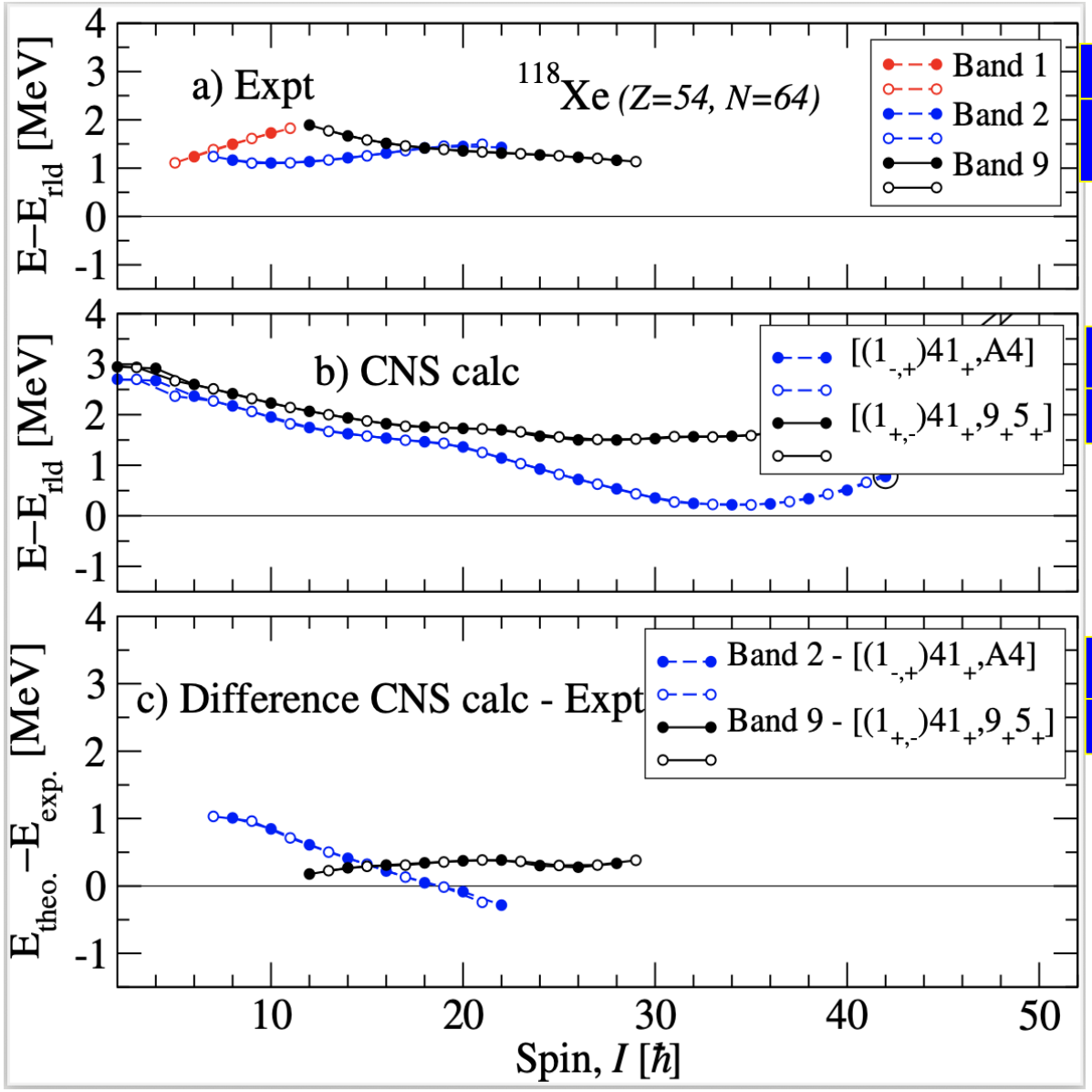




Shape coexistence in ^{118}Xe



Strongly-coupled bands in ^{118}Xe



$\pi(\Gamma_{11/2})^1(g_{7/2})^1$ – oblate shape

prolate shape

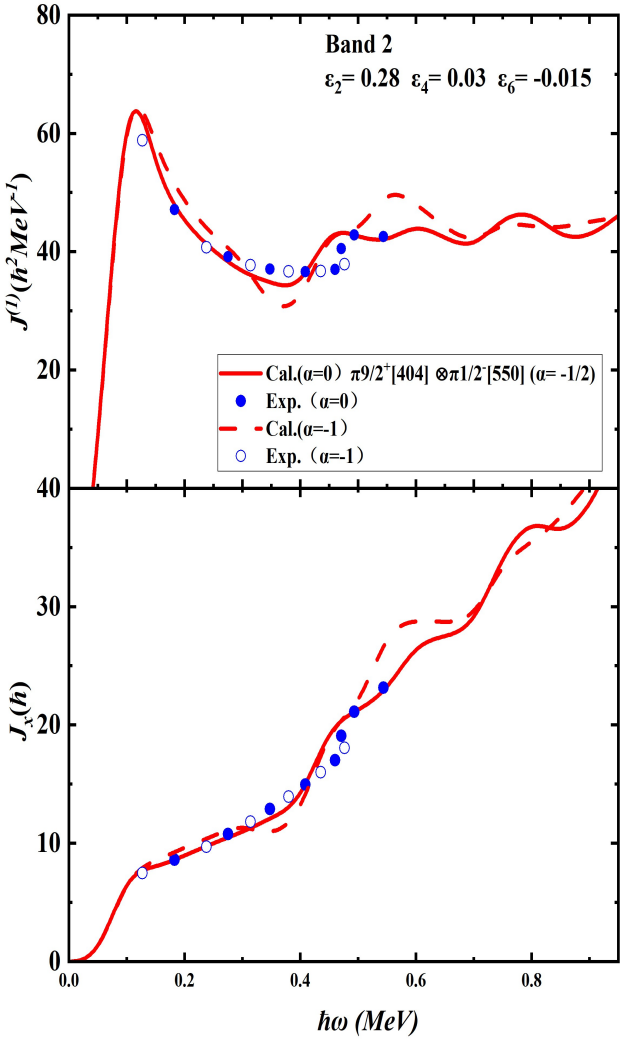
$\pi(g_{9/2})^{-1}(h_{11/2})^1$

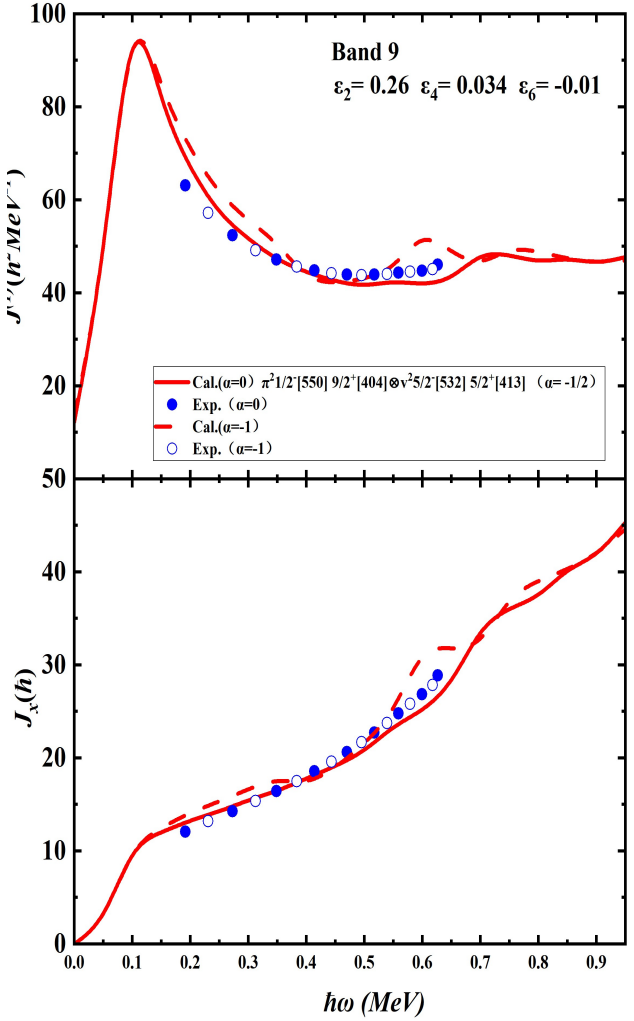
$\pi(g_{9/2})^{-1}(h_{11/2})^1 \otimes \nu(g_{7/2})^1(h_{11/2})^1$

$\pi(g_{9/2})^{-1}(h_{11/2})^1$

$\pi(g_{9/2})^{-1}(h_{11/2})^1 \otimes \nu(g_{7/2})^1(h_{11/2})^1$

Particle Number Conserving – Cranked Shell Model (PNC-CSM)





Collaboration

Experiment:

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Finland: R. Julin, J. Uusitalo

France: C.M. Petrache, A. Astier

Canada: C. Andreoiu

Poland: J. Srebrny

Hungary: J. Timar

UK: R.D. Page

Theory:

China:

Q.B. Chen (Shanghai)

J. Yang (Dalian)

X.T. He (Nanjing)

Y.X. Liu (Huzhou)

Sweden:

I. Ragnarsson

Thank you