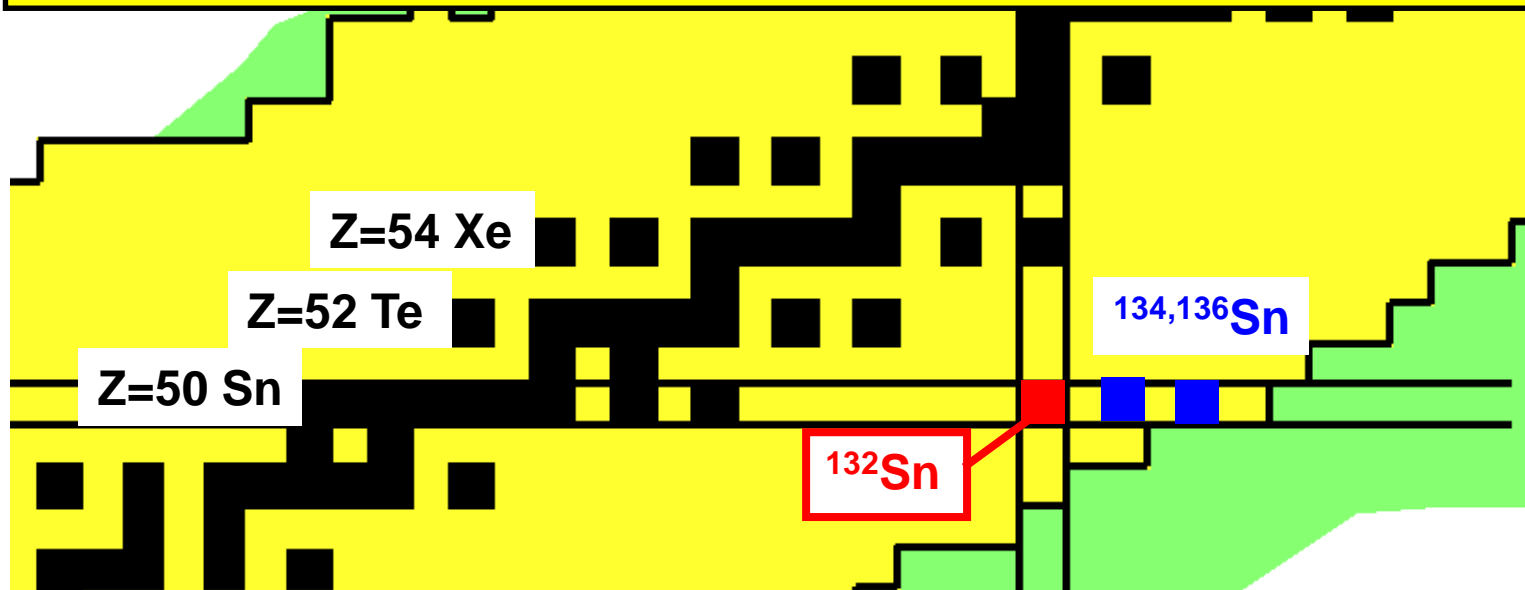


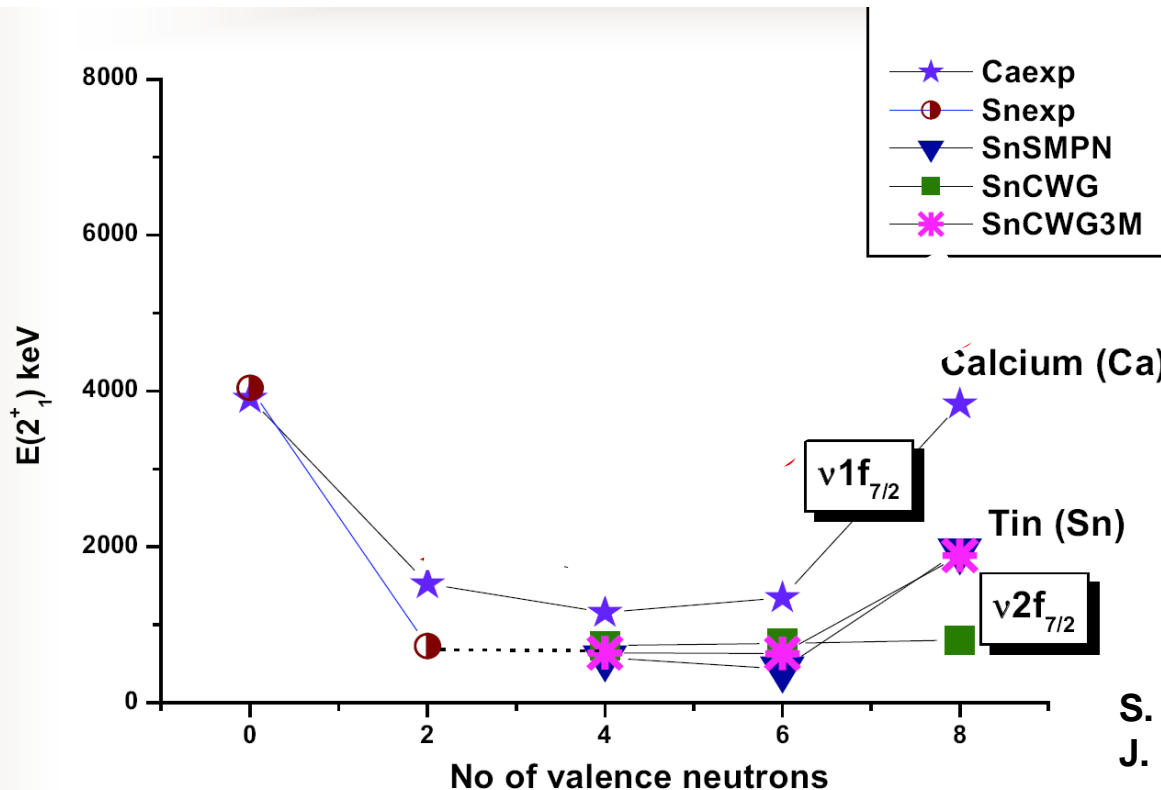
IS549: Coulomb excitation of neutron-rich $^{134,136}\text{Sn}$ isotopes

Spokespersons: Th. Kröll / G. S. Simpson

- Doubly-magic shell closure in ^{132}Sn
 - below N=82 (nearly) perfect seniority scheme
- $^{132}\text{Sn} + 1$ or 2 pairs of neutrons (**exclusively neutron-neutron interaction**)
 - $E(2^+) = 726$ keV in ^{134}Sn
but $B(E2; 0^+ \rightarrow 2^+)$ similar to ^{130}Sn
 - Asymmetry with respect to N=82, but different compared to ^{136}Te



IS549: Coulomb excitation of neutron-rich $^{134,136}\text{Sn}$ isotopes



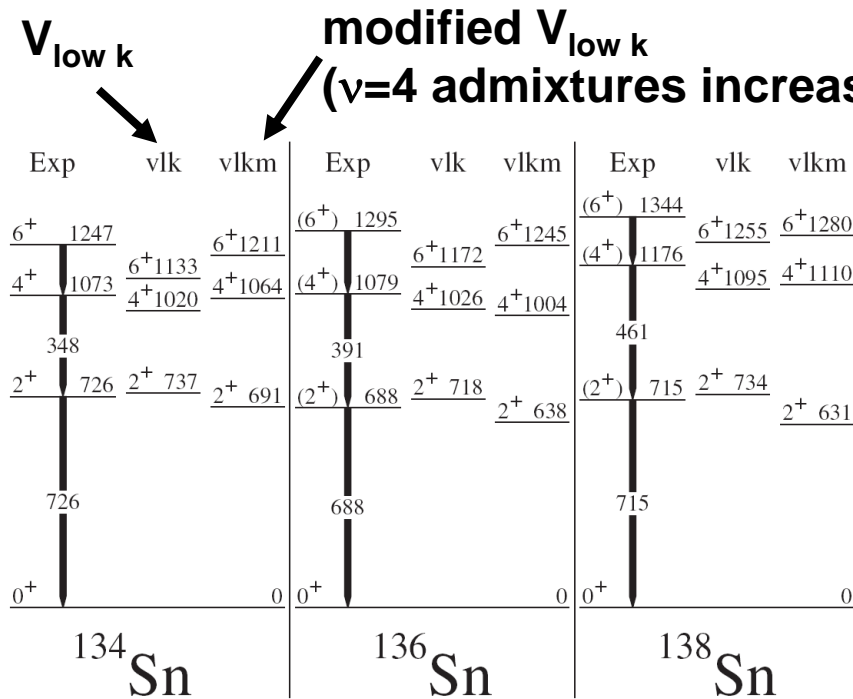
- Empirical interaction predicts shell closure at N=90 (SMPN)
- realistic interaction (CWG): no closure!
- realistic interaction + 3NF (CWG3M) → shell closure at N=90

S. Sarkar and M. Saha Sarkar,
J. Phys.: Conf. Ser. 267, 012040 (2011)

Very similar situation (again $\nu f_{7/2}$ neutrons) in the Ca isotopic chain:
Realistic interaction reproduces the N=28 shell closure in ^{48}Ca only if
3NF is added

J. D. Holt et al., J. Phys. G: Nucl. Part. Phys. 39, 085111 (2012)

IS549: Coulomb excitation of neutron-rich $^{134,136}\text{Sn}$ isotopes



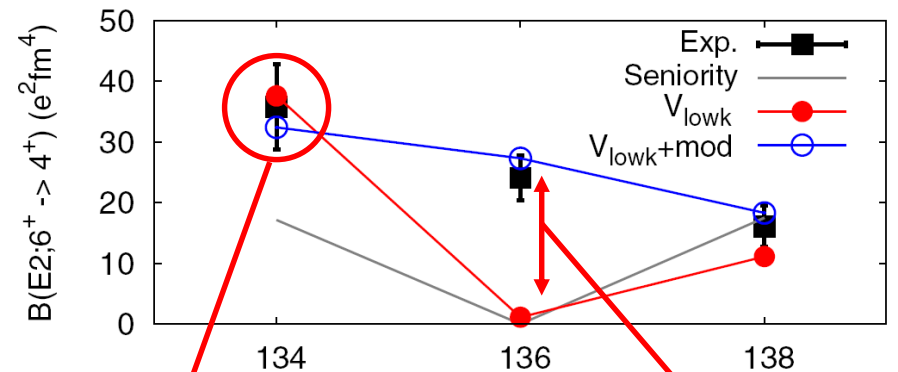
G.S. Simpson et al., PRL 113, 132502 (2014)

Only known $B(E2, 0 \rightarrow 2)$ value

... but large error:

^{134}Sn : $0.029(5) e^2b^2$

R. L. Varner et al., EPJ A 25, s01, 391 (2005)



Predictions very similar

Predictions differ by factor 6!!!

Physics aims

- transitional quadrupole MEs

→ $B(E2)$ values

- diagonal E2 MEs

→ quadrupole moments Q_2

... for 2^+ and 4^+ states in $^{134,136}\text{Sn}$

6^+ is isomeric!!

→ Coulomb excitation will end at 4^+ state!

IS549: Coulomb excitation of neutron-rich $^{134,136}\text{Sn}$ isotopes

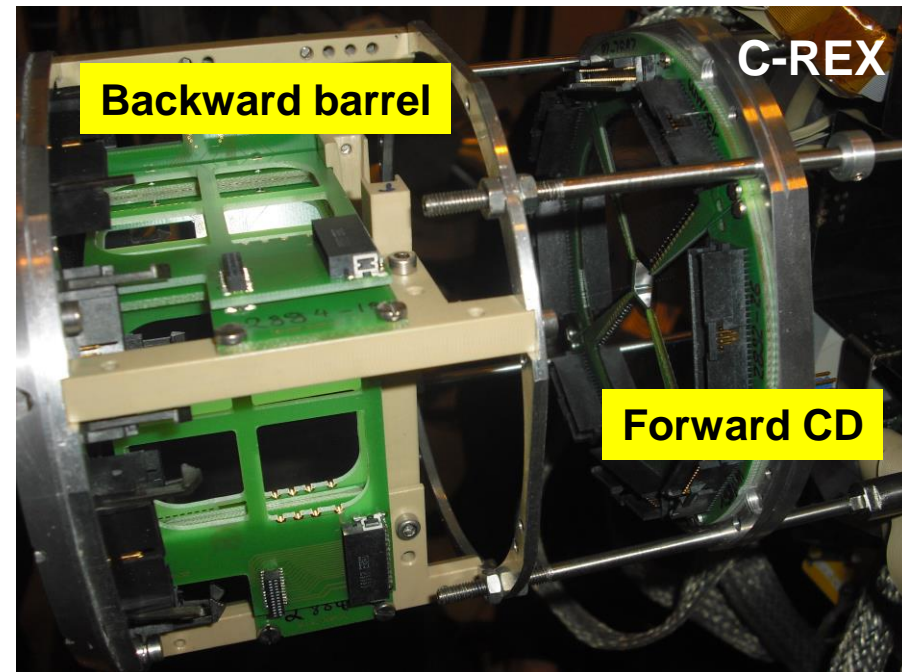
- safe Coulex (4.4 MeV/u) on ^{206}Pb

MINIBALL + C-REX

- Large angular range (CMS): 25° - 170°
→ different sensitivities on single/multiple excitation and reorientation
Statistical error / angular bin: 5-20%

- **Molecular beam $^A\text{Sn}^{34}\text{S}^+$**
(has been used by IS441)

	$T_{1/2}$ [s]	Yield [/ μC]	Int [/ s]
^{134}Sn	1.06	10^6	10^5
^{136}Sn	0.25	$2 \cdot 10^4$	10^3



Analysis by Corinna Henrich as doctoral thesis at TU Darmstadt

We request 30 shifts (10 days) of beam time