Collinear Resonance Ionization Spectroscopy of neutron-rich copper isotopes

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Laser spectroscopy of Cu isotopes

Collinear laser spectroscopy:

- Up to $^{75}$Cu
- $^{73}$Cu → $^{75}$Cu: spin change $3/2 \rightarrow 5/2$
- Moments reproduced by proton excitation across $Z=28$ (→ weakening shell gap)

In-source laser spectroscopy:

- $^{77}$Cu: dipole moment, spin
- $^{78}$Cu: absence of isomers, small dipole moment
Overview of literature:
- All observables up to $^{75}$Cu
- I, magnetic dipole for $^{77}$Cu
CRIS results

CRIS combines strengths of in-souce and collinear laser spectroscopy

- 76: $\mu$, $\delta<r^2>$, I, Q
- 77: $\delta<r^2>$, I, Q
- 78: $\mu$, $\delta<r^2>$, I, Q – ? analysis ongoing
Future prospects

- CRIS has pushed high-resolution measurements
  - High resolving power
  - High background suppression
  - Additional three isotopes – most exotic case ~10pps

- Can CRIS cope with presence of contaminants for $^{79}\text{Cu}$?

  **Our goal: $^{79}\text{Cu}$!**