

# Study of light nuclei far beyond the proton drip-line

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The known ground and excited states of unbound light nuclei decay by either one-proton ( $1p$ ), or two-proton ( $2p$ ), or  $3p$  or  $4p$  emission. The experiments identifying such exotic isotopes with mass number up to 31 as well as the established decay mechanisms will be reviewed.

While mechanism of  $1p$  decay is known long time ago, the  $2p$ -decay modes are still under investigation in a number of unbound isotopes. The current status of  $2p$ -emission mechanisms, namely the “sequential”, “true” and “democratic”  $2p$  decays as well as their transitions will be discussed.

More exotic  $3p$  decays are observed in isotopes  $^{17}\text{Na}$ ,  $^{31}\text{K}$ ,  $^{13}\text{F}$ , and even  $4p$ -emission is reported in decays of  $^8\text{C}$ ,  $^{18}\text{Mg}$  ground states. Conclusions on the respective decay mechanisms will be presented.

Experimental insights into exotic nuclear structure of proton resonances will be highlighted, and prospects of future experimental studies will be given.