LIME: a gas TPC prototype for directional Dark Matter search for the CYGNO experiment

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- Looking for DM through directional signature of low energy nuclear recoils (NR)
- LIME 50L prototype, now installed underground at LNGS
- Gaseous TPC with GEM charge amplification and optical readout (1 sCMOS camera + 4 PMTs)
- Tested overground at LNF with radioactive X-ray sources

- Measured energy resolution of \(\sim 15\%\) at 6 keV (\(^{55}\text{Fe}\))
- Stability tested for 1 month
- Response is linear and consistent with Monte Carlo (MC) simulation
- MC simulation of sCMOS images to study track shape and detector’s response

- MC simulation of background at LNGS (in view of the upcoming data taking campaign – background characterization, MC validation, neutron flux spectral measurement)