Looking for Cherenkov light in liquid Xenon with LoLX

S. Al Kharusi[a], T. Brunner[a], C. Chambers[a], B. Chana[b], A. de St. Croix[c], E. Egan[a], M. Francesconi[d], D. Gallacher[a], L. Galli[d], P. Giampa, J. Lefebvre[e], P. Margetak[c], J. Martic, M. Patel[c], B. Rebeiro[a], F. Retière[c], L. Rudolf[a], G. Signorelli[d], S. Stracka[d], M.-A. Tétrault[e], S. Viel[b], L. Xie[c]

- We want to disentangle scintillation light and Cherenkov radiation in liquid xenon
  - different spectrum, different timing
  - can be used for background rejection in, e.g., neutrino-less double-beta decay of Xe (es. nEXO)
  - LoLX is fully submerged in a LXe volume and uses 96 SiPMs to measure LXe scintillation and Cherenkov radiation from a ^{90}Sr source needle.
- Filters in front of SiPMs help disentangling the different spectra
  - 22 longpass λ>220 for Cherenkov
  - 1 + 1 with no filter (scintillation ~ 178 nm)
- Preliminary results show that there is an excess of non-scintillation light maybe due to fluorescence in the 3D printed cage material
- Plans to repeat with aluminum cage and refined DAQ, including waveform digitizing for timing characteristics.