LUXE: physics case and theoretical aspects

Physics case and theoretical aspects (Andreas, Tony)

1. What makes XFEL ideal (or not) for this experiment in terms of beam parameters (e.g. bunch length in z, energy, …)? (Particularly compared to other proposals (e.g. FACET-II))
2. What is the physics rate of the different types of events (inverse Compton and pair production) per electronlaser crossing for typical set of parameters? Need energy spectra and rates of photons and electrons for input to detector simulations.
3. How many photons from the laser field are we absorbing at typical laser parameters?
4. What is the mass shift and what drives it? How does this affect a detector design? E144 could not measure it.
5. What new physics are we sensitive to and how does this manifest itself?