

Mandate for the convener of the FCC/TLEP-WG7 “Experimental Signatures for New Physics”

1. Physics Objectives

- a. Evaluate the TLEP potential for new physics sensitivity, be it through direct production, or through rare decays of Z, W, Higgs boson and top quark (in particular), for a variety of new physics models.
- b. Contribute to the development of the pertaining Monte Carlo generators.
- c. Understand specific requirements on detector performance and infrastructure.
- d. Develop a strategy in terms of centre-of-mass energies and integrated luminosities to optimize the TLEP potential.

2. Managerial objectives

- a. Define and start the activities of the group with a global vision, seeking for international collaboration. Synergies with linear collider studies, in particular, will have to be exploited whenever deemed relevant and useful.
- b. Attract people for the studies relevant to the group. The list of TLEP subscribers with a declared interest in the search for signatures of new physics is compiled in the mailing list (e-group) TLEP-NewPhysics@cern.ch. One of the roles of the convener is to extend this list as much as possible (and ask new interested people to subscribe to the study through <http://tlep.web.cern.ch>).
- c. Maintain a high level of contacts with the other groups of the studies, in particular “Detector Designs”, “Experimental Environment”, “Offline software”, “Electroweak Physics at the Z pole”, “H(126) Properties”, “Top quark Physics”, “Flavour physics” and the relevant “Phenomenology” physics groups.
- d. Create adequate sub-groups (if deemed useful) to match the group scientific objectives, and suggest appropriate sub-conveners, possibly starting with a high-profile convener for each of the sub-groups.
- e. Find, within about a year, one (or two) associate(s) to work as co-conveners, and able to take over the convener task after two

years or thereabout (although of prolongation of the mandate of the first convener until the end of the study is not excluded, of course). The collaboration with a new-physics-theory expert could be an important asset.

- f. Appoint editors towards the production of intermediate reviews and a final yellow report. (See “Timescale and deliverables below.”)
- g. Report progress to the physics coordination of the study and at regular TLEP physics meetings (held monthly for the time being).

3. Timescale and deliverables

The Working Group “Experimental Signatures for New Physics” is part of the physics coordination of the TLEP design study, itself part of the FCC (Future Circular Collider Design Study at CERN). The FCC study consists of three phases:

- a first phase, called “Exploration” until March 2015 or thereabout, which will serve exploring all possible options and potential studies, and identifying requirements and constraints;
- a second phase, called “Analysis” until September 2016 or thereabout, where the identified baselines are conceptually studied in detail and in an integrated fashion;
- a third and last phase, called “Elaboration”, expected to last until the end of 2017, which delivers all information required for the final Conceptual Design Report (CDR) of the study.

Each phase will conclude with a workshop and a review milestone that will layout the directions of the next phase. It would therefore be instrumental to foresee an interim written report of the work of the group after the first two phases. A final yellow report, which will be part of the FCC CDR, is to be delivered at the beginning of 2018, and will document the scientific achievements of the group, expected to match or exceed the objectives set in the first section.

The “Phase 0” for TLEP physics studies, called “Preparation” is happening now. It should be concluded within a few weeks by the delivery, from the group convener to the physics coordinator, of a document describing in some details the “scope” for the group, with work areas, deliverables, and timeline, at least for Phase 1.