ID de Contribution: **109** Type: **Non spécifié**

Beam optics design for PRAE linac and FCC-ee injector positron linac

In the latest years, there has been intense linac electron-accelerator development driven by different communities, such as the X-FEL community, the High Energy Physics (HEP) linear-collider community: ILC and CLIC as well as HEP circular colliders: FCC-ee and CepC. Furthermore, there are also many other applications from medical treatment (radiobiology) to industrial applications that will use such a linac (linear accelerator) as main accelerator. In all these studies, a high-efficient e-linac with energies from 10-1000 MeV is needed as a driver or an injector. Even if the linac technology to cope with the performances needed is very well known, an important R&D effort on more compact, simpler, cost-effective, efficient, robust and reliable is in progress. The optimization of the linac and its associated lines in two cases is included in the frame of this report: 1). The linac for applications known as PRAE (Platform for Research and Application with Electrons). 2). The injector linac for FCC-ee (Future Circular Collider e+e-), in particular the positron one.

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Classification de Session: Theme 1