

FACET Electron Beam Parameters

As of May 2013

Table 1: Typical FACET beam parameters for stable delivery during 2013. Other parameters may be possible with compromises. FACET beam configurations for future runs will be decided based on programatic need.

Parameter	Uncompressed	Compressed	Two-bunch ¹
Particle ²	Electrons	Electrons	Electrons
Energy	20 GeV	20 GeV	20 GeV
Charge/pulse ³	1.6 nC	1.6-3.2 nC	
IP Spot Size ⁴	30 μm x 30 μm	30 μm x 30 μm	
Bunch Length ⁵	500 μm	30 μm	
Rep. Rate	1-30 Hz	1-30 Hz	1 Hz

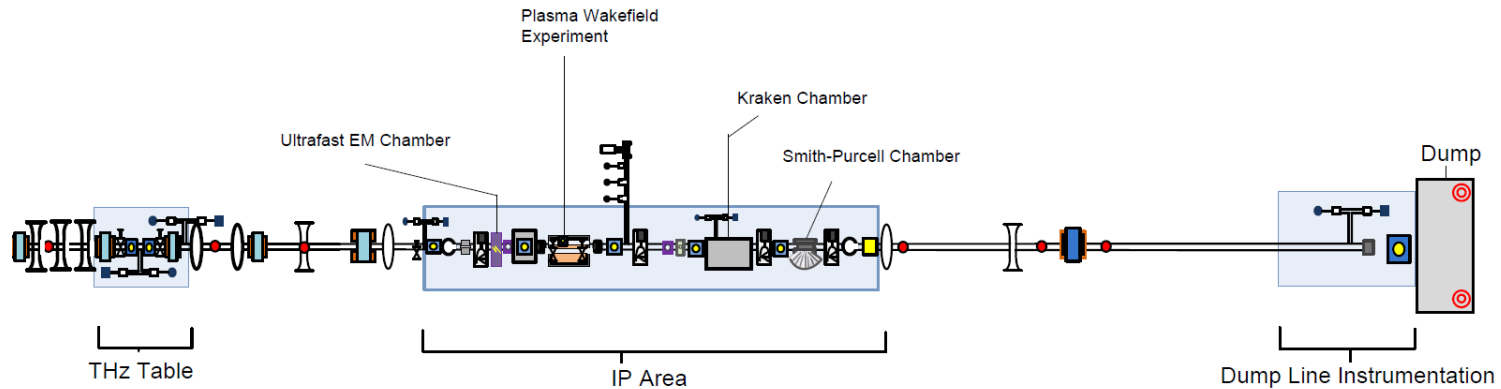


Figure 1: The three optical tables that make up the FACET experimental area and surrounding beamline components. The beam optics can deliver small, round spots to the experiments on the tables in the IP Area.

Please see information on FY13 delivered beam parameters here: https://portal.slac.stanford.edu/sites/ard_public/facet/Pages/PerformanceMetricsFY13.aspx

¹ To be commissioned May-June 2013.

² Hardware exists for positron delivery but the positron beam is not yet commissioned.

³ In 2013, we operated at two charge settings: 1nC and 3.2nC. These two settings were separated ~1-2 weeks in order to tune the machine for the higher charge.

⁴ We can shift the waist with optics to different z locations in the "IP area" and so stage experiments in series and change the optics to suit their spot-size requirements. The THz table and dump have very different spot sizes but we can also stage experiments there.

⁵ Compression is achieved through 3 stages. Different compression configurations can be discussed within this range.