

FCC-ee questionnaire

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Preamble

There are several options of the FCC-ee lattice under discussion now (crab-waist, 11-mrad crossing angle, head-on???). There are two lattice variants of the crab-waist scheme (BINP/Oide). It is a time of fast changes in the FCC-ee strategy and concept. For more efficient machine development and moving in the same direction coherently and controllably we have to discuss some crucial issues.

We believe that it would be useful to formulate results of the discussion in the written form.

We encourage you to add your questions.

Questions I

1. How many collision options should be studied (crab-waist, head-on, 11 mrad crossing angle)? What is the priority?

We should concentrate on a crab-waist for the time being, and non-crab waist should be done by just turning-off the crab sexts. No special lattice is needed for non-crab waist. (Answer by Oide-san)

2. Should we develop the only lattice or both (Oide/BINP)? Our opinion is that for a while we have to continue with two versions until either they converge to a single one or one of them encounters an obstacle.

We should go in parallel for the time being as you say.

3. Two or four IPs? Our lattice now has 4 IPs and Oide's – 2 IPs.

Please go ahead with 4IP in your case. I would like to stay at 2.

4. Tunnels geometry should be considered in more details and recommended for the accelerator designers.

I completely agree with you.

5. The FF area including solenoids, quadrupoles, luminometer should be studied in details because of great impact of this region to further lattice design. I have an idea that BINP can produce an assembly of the FF quadrupole prototype together with the first anti-solenoid and shielding solenoid, and measure the magnetic field configuration. But for this work we need a contract with CERN.

I agree with you. As for the quads, a design with higher field gradient (with permendur in your case) will benefit.

Questions II

6. Is crossing angle increase from 30 mrad to 60 mrad beneficial or not?

Let's stay at 30 for the time being.

7. Is vertical beta-star increase from 1 mm to 2 mm beneficial or not?

Let's stay at 1 mm for the time being. Also the horizontal beta* should be discussed (1 m instead of 50 cm).

8. We have to push forward development of the injector synchrotron and injection scheme because it can also influence the main ring design.

That is right. I wonder what is the status of the injector WG.