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SSC RF parameters, with 90 meter half cell length

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With the change in half cell length to $H_{1/2} = 90$ meters, it is necessary to adjust the nominal bunch spacing, S_B, and hence the RF wavelength, λ_{RF}, to maintain an integer number of bunch CROSSINGS, N_B, per half cell, so that

$$N_B \frac{S_B}{2} = H_{1/2}$$

We propose $N_B = 36$, so that $S_B = 5.0$ meters, slightly larger than the CDR value of 4.8 meters, and the most recent value of 4.774 meters. This guarantees that the nominal bunch spacing can be increased by factors which divide exactly into $36 = 2^2 3^2$, that is, 2,3,4,6,9,12,18 and 36 . Other factors may also be possible, depending on the numbers of half cell lengths between adjacent interaction points - both the short way and the long way, around an arc. These numbers must be integers.

The bunch spacing itself must be an integer number of wavelengths, $S_B = N_{RF} \lambda_{RF}$, so that

$$\lambda_{RF} = \frac{2 H_{1/2}}{N_B N_{RF}}$$

Maintaining the old value of $N_{RF} = 6$ leads to a value of $\lambda_{RF} = 0.8333..$ meters, and an RF frequency of approximately 360 MHz (assuming $c = 3\ 10^8$ meters per second). This value, very close to the PEP, LEP and SPEAR values of 353 Mhz, 353MHz, and 358MHz, is somewhat less than the most recent SSC value, 377.1 MHz.