ILC Damping Ring Parameters Update

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Update

- We revisited the Damping Ring Parameters
  - ILC-EDMS Document D00000000960955
- Some 10 Hz mode e^- ring numbers were scaled values and needed to be checked
- We made a new lattice for this mode with a wiggler field strength of 1.8 T (compared to 2.2 T for for the 10 Hz mode e^+ ring)

Result Comparison

- We compared the spreadsheet to the output from Tao (Bmad) for:
  - Damping times
  - Equilibrium emittances
  - RMS relative energy spread
  - Momentum compaction
- In general, see good agreement...

Minor discrepancies

- Equilibrium horizontal emittance: 0.55 nm vs. 0.60 nm (spreadsheet)
- RMS bunch length: 6.16 mm vs. 6.0 mm (spreadsheet)
  - Coming from small difference in RMS relative energy spread: 0.123% vs. 0.12%
  - Can account for this by changing the RF voltage from 17.0 V to 17.8 V to get a 6.0 mm bunch length
- In addition, we discovered that the extracted horizontal emittance for the 10 Hz e^+ column was being calculated from the e^- column (due to copy/paste mistake?)
  - 0.61 nm $\rightarrow$ 0.64 nm