The AC Dipole system for LHC

Controls hardware & status

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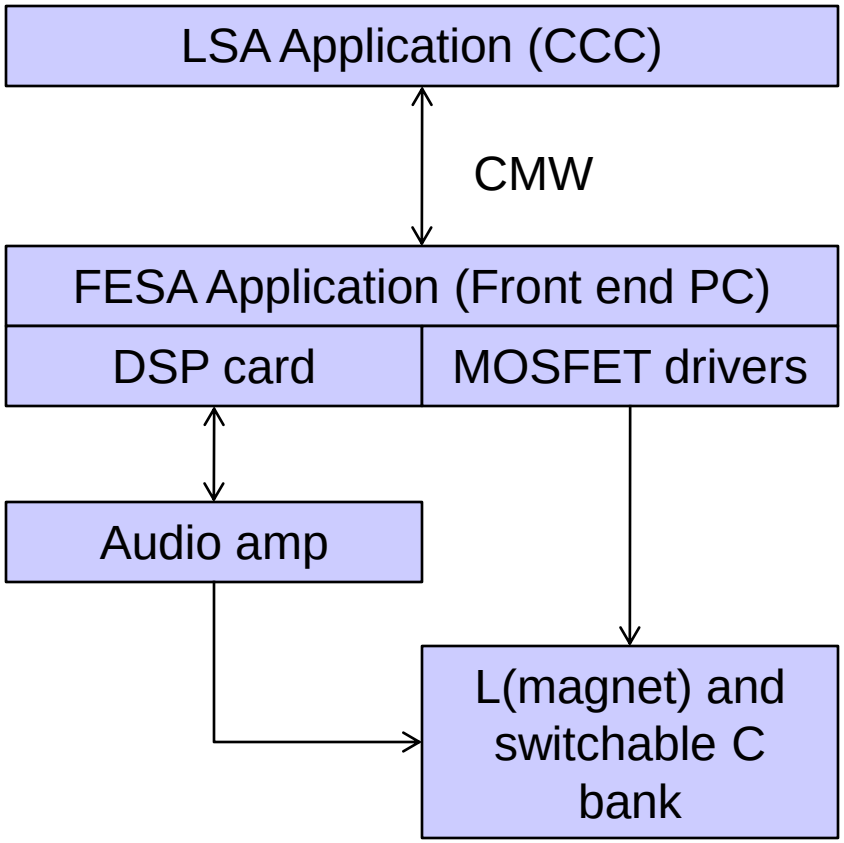
Specs reminder

- 7σ deviation at injection energy for δ=0.025±0.01. Excitation on only one side of the tune OK.
- This deviation at 450 GeV translates into ≈1800A peak in the magnet at around 3 kHz.
- Given the uncertainty for the tune (±0.015), the total span of the system should be 11245*0.05=562.25 Hz.
- Horizontal tune between 0.28 and 0.31 → resonant system centered at (0.295+0.025)*11245 ≈ 3600 Hz and with a bandwidth of 562.25 Hz.
- Therefore Q=6.4 which is roughly what we have measured in our real test stand due to actual losses, so no need for Q spoiling.

Controls architecture



Status

- Power amplifiers preselected and concept validated. Lab.Gruppen FP13000 13 kW amplifiers. Two of them transformer-coupled to get enough current.
- DSP card selected currently under investigation: Innovative Integration Delfín PCI card.
- LSA application program part of Fermilab contribution to LHC.
- FESA and hardware design at CERN with BNL help for switchable C bank.
- First installation and tests in LHC expected in January 2008.