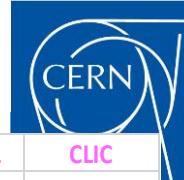




Summary IMC RF systems

https://www.dropbox.com/s/2e71dj9bzomqlwm/MC_RF%20Summary%20Draft.xlsx?dl=0



| System | | Driver | | | Front-End | Cooling | | | Acceleration | | | Collider | TOTAL | CLIC | |
|--------------------------------|---------------------------------|----------------------------|-----------|--------------|--------------------|----------|--------------|-----------------|----------------|----------------|---------------|--------------|----------|--------------|------------|
| Sub-system | | Driver Linac H- (SPL like) | | Accum & Comp | Capture & Bunching | Initial | 6D (2 lines) | Final (2 lines) | Injector Linac | RLAs (2stages) | RCS (3stages) | Ring | IMC | Acceleration | |
| Reference expert | | F.Gerigk | | ? | D.Neuffer | C.Rogers | D.Stratakis | C.Rogers | A.Bogacz | | S.Berg | E.Gianfelice | | | |
| Beam (system exit) | Energy | GeV/c | 0.16 | 5 | 5 | 0.255 | 0.255 | 0.255 | 0.255 | 1.25 | 62.5 | 1500 | 1500 | 1500 | |
| | # bunches ($\mu+$ or $\mu-$) | # | 40 mA | | 1 | 12 | 12 | 1 | 1 | 1 | 1 | 1 | 1 | 312 | |
| | Charge/bunch | E12 | | | 500 | 3.57 | 2.56 | 7.21 | 4.39 | 3.73 | 3.17 | 2.22 | 2.20 | 3.72E-03 | |
| | Rep Freq | Hz | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 50 | |
| | Norm Transv Emitt | rad-m | | | | 1.5E-02 | 3.0E-03 | 8.3E-05 | 2.5E-05 | 2.5E-05 | 2.5E-05 | 2.5E-05 | 2.5E-05 | 2.5E-05 | 660/20E-06 |
| | Beam dimens. (H/V) in RF | mm | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | 1? |
| | Norm Long Emitt | rad-m | | | | 4.5E-02 | 2.4E-02 | 1.8E-03 | 7.0E-03 | 7.0E-03 | 7.0E-03 | 7.0E-03 | 7.0E-03 | 7.0E-03 | |
| | Pulse/Bunch length | m | 2.2 ms | | 0.6 (2ns) | 1.1E+01 | 1.1E+01 | 9.2E-02 | 9.2E-02 | 4.6E-02 | 2.3E-02 | 2.3E-02 | 5.0E-03 | | 4.4E-05 |
| Power ($\mu+$ and $\mu-$) | W | 6.40E+04 | 2.2E+06 | 2.0E+06 | 1.8E+04 | 1.3E+04 | 3.0E+03 | 1.8E+03 | 7.6E+03 | 3.2E+05 | 5.4E+06 | 5.3E+06 | | 2.8E+07 | |
| RF cavities | Technology | | NC Linac4 | SC | SC | NC | NC | NC Vacuum | NC | SC | SC | SC | SC | NC High Grad | |
| | Number of cavities | # | 23 | 244 | 2 | 120 | 367 | 7182 | 32 | 52 | 360 | 2694 | ? | 11076 | 149000 |
| | RF length | m | 46 | 237 | 1 | 30 | 105 | 1274 | 151 | 82 | 1364 | 2802 | ? | 6092 | 30000 |
| | Frf | MHz | 352 | 704 | 44 | 326to493 | 325 | 325-650 | 20-325 | 325 | 650-1300 | 1300 | 800 | 4 to 1300 | 12000 |
| | Grf | MV/m | 1-3.7 | 19 - 25 | 2 | 20 | 20 to 25 | 19-28.5 | 7.2-25.5 | 20 | 25 to 38 | 35 | ? | 1 to 38 | 100 |
| | Aperture | mm | 28 | 80 | | ? | ? | ? | ? | 300 | 150 | 75 | 120 | 28 to 300 | 2.75 |
| | Magnetic Field | T | 0 | 0 | | 2 | 3T | 1.7-9.6 | 1.5-4 | 0 | 0 | 0 | 0 | 0 to 9.6 | 0 |
| | Installed RF field | MV | 169 | 5700 | 4 | 434 | 2618 | 30447 | 1836 | 1640 | 50844 | 98062 | 250 | 1.92E+05 | 3.00E+06 |
| | Beam Energy gain | MeV | 160 | 4840 | 0 | 0 | 0 | 0 | 0 | 1250 | 62500 | 1437000 | 0 | 1.51E+06 | 1.50E+06 |
| | Recirculations | # | 1 | 1 | | 1 | 1 | 1 | 1 | 1 | 4.5 to 5 | 13 to 23 | 1000 | 1 to 1000 | 1 |
| | RF Power/pulse ($\eta=0.6$) | MW | 25 | 220 | 3.E-01 | 99 | 429 | 1172 | 43 | 52 | 360 | 2024 | 1.98E-02 | 4425 | 1.2E+07 |
| RF power sources | Technology | | klystron | klystron | | | | | | Klytron-IOT | | | | Two Beam | |
| | Cavities/Power Source | # | 23 | 244 | | 4 | | | | 1 to 2 | 1 to 2 | | | 2 | |
| | RF Pulse (fill+beam) estim. | ms | 2.20 | 2.20 | 3.20 | 1.00E-01 | 1.00E-01 | 1.00E-01 | 1.00E-01 | 3.00E-02 | 5.90E-02 | 7.25E-01 | 1.48E+01 | 1.42E-01 | |
| | Prf/Power Source | MW | 11.7 | 1.93 | | | | | | 1 | 1 | | | 15 | |
| | Total Power Sources | # | 17 | 244 | | 30 | | | | 52 | 341 | | | ? | 1638 |
| | Installed Peak RF Power | MW | 34 | 275 | | 164 | 515 | 1407 | 52 | 52 | 341 | 2429 | 2.38E-02 | 5269 | 2.46E+04 |
| | Average RF power ($\eta=0.6$) | MW | 0.27 | 2.13 | 0.01 | 0.05 | 0.21 | 0.59 | 0.02 | 0.01 | 0.11 | 14.88 | 0.00 | 18.28 | 143 |
| Wall plug power ($\eta=0.6$) | MW | 0.45 | 3.55 | 0.01 | 0.08 | 0.36 | 0.98 | 0.04 | 0.01 | 0.18 | 24.81 | 0.00 | 30.46 | 289 | |