**Space Charge 2017 Grand Survey**

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|  |  |
| --- | --- |
|  | **Data units/Comments/Description/etc. …** |
|  |  |
| **Laboratory** |  |
|  |  |
| **Machine Name** |  |
|  |  |
| **General:** |  |
| relativistic beta |  |
| Intensity |  |
| emittance |  |
| brightness |  |
| KV tune-shift, tune-spread |  |
| distribution form factor (KV, WB, G) |  |
| Gaussian distribution  |  |
| Budget %Emittance growth  |  |
|  % beam loss |  |
| storage time and/or |  |
| # of synchrotron oscillations |  |
| direct/indirect SC |  |
| Injection process |  |
|  |  |
| **Machine:** |  |
| symmetry |  |
| dispersion (local!) |  |
| instrumentation & control |  |
| Transition gamma |  |
| TBT system |  |
| 2 plane chromaticity correction |  |
| linear model |  |
| non-linear model |  |
| magnet error table |  |
| correctors to deal with resonances |  |
| remnant fields |  |
| misalignment |  |
| aperture model |  |
| PS ripple |  |
| noise |  |
| Slow drifts & stability |  |
|  |  |
| **Leading Known “Limiting Mechanisms”:** |  |
| Dynamic aperture |  |
| resonances |  |
| Single particle nonlinear effects |  |
| Chromaticity |  |
| Transverse-longitudinal coupling |  |
| Potential well distortion? |  |
| Bunching factor? g-factor |  |
| Incoherent space charge |  |
| Coherent space charge: coherent resonances? |  |
| Longitudinal effects: Micro-bunching instability |  |
| Longitudinal dynamics: loss of Landau damping |  |
| Crossing transition  |  |
|  |  |
| **Space Charge Coupling:** |  |
| Vacuum |  |
| Electron Cloud |  |
| SC and impedance |  |
|  |  |
| **Suspected New / Unclear Mechanisms** |  |
| How to define the storage time in RCS? |  |
|  |  |
| **Limits to Intensity Predictability** |  |
| - (Real Machine Intensity) / (Project Design Machine Intensity) |  |