Why the GG Design? Novelties and Advantages (VI)

Radiometer Effect OK at Room Temperature

- Radiometer effect is known to be a big EP "experiment killer"
  It is a differential acceleration due to the different pressure of the residual gas at two sides of the test cylinders not at the same temperature

  Very low temperature makes all gases freeze, pressure becomes very very small, which solves the problem: this is the STEP choice ($\cong 2\,K$; needs $\cong 300\ l\ of\ He \Rightarrow$ *other* problems)

  In GG the signal is not along the symmetry z-axis (like in STEP), but transverse to it ⇒ radiometer effect is zero by symmetry; imperfect symmetry and radiometer effect along the z axis require temperature gradients along this axis to be less than about 1 K (doable)

Passive Thermal Stability

- Fast spin eliminates azimuth temperature asymmetries
- Thermal insulation and vacuum make temperature oscillations with the eclipse period very small and can keep the temperature drift of the test masses

$\dot{T} \leq 0.2\ K / day$ maintains balancing for 15/20 days

Effects from Local Mass Anomalies DC

- Local mass anomalies couple differently with the multipole mass moments of the test bodies which cannot all be made equal for the two masses; but everything spins ⇒ DC effect

- In STEP any anomaly in the mass distribution of Helium around the test masses gives an effect at the same frequency as the signal, and it is a serious problem to deal with.

Effects from Parasitic Capacitances DC

Parasitic capacitances depend on the geometry of the system, and since the whole system spins, their effect is DC