FIBRE Fabry Perot typical values
August 2000
Updated March 2001

Capacitive sensor :

27 pF for 0.2 mm spacing, 5.45 pF for 1 mm spacing

Coil impedance :

cold (4 K) ~30 Ω, warm (300 K) ~2.6 kΩ, 280 m of wire (50 µm copper), 6600 turns

Current (min/max) :

cold@77 K -18 (unstable)/+18 mA, warm -3.8/3.6 mA, test mode -16/+16 mA
cold@1.5 K –32/+32 mA
1 mA (on each motors) gives approx. a 8 µm displacement

Effect of tilt :

typ. +/- 2 mA for +/- 30°

Temperature of moving plate :

1.4 K for 0 mA on 3 motors, 2.6 K for 3 mA on 3 motors, 7 K for 12 mA on 3 motors

Motor error noise (peak-peak) :

in test dewar 4 mV, in FIBRE CTI running no air suspension 50 mV, CTI OFF<10 mV
in FIBRE CTI running and with air suspension 10 mV

Motor error and command calibration :

4 mV (Mac or pin P1-17 on electronics) <=> 5 on command <=> 0.8 to 0.9 µm

Command :

12 bits (0-4095), mechanical zero around 2500

Command table precision :

+/- 10 on command (motor 1 is reference, offset on motors 2 and 3)

Command table range :

1600 - 3075 (at 77 K, May 2000) for motor 1

Plates optical spacing :

7390 µm for command=2500 (measured in May 1998, previous electronic boards)

Sampling and noise level vs resolution :

$\Delta e = n\,\Delta\lambda/2$ (e is the spacing, n the order)
the resolution element is $\Delta\lambda = \lambda/R$ (R is the resolution)
for n=42 and R=1200 at λ=350 µm, $\Delta\lambda$=0.29 µm and Δe=6.1 µm

sampling at twice the resolution is obtained for δe~3 µm

1 σ noise requirement is 1/3 of sampling ie $\sigma_{sampling}$=1 µm or 5 mV on motor error
peak to peak noise = 4 σ ie 4 µm or 20 mV peak to peak (measured ~10 mV CTI running with air suspension)

FP electronic board

typical consumption : 150 mA on +12V and on –12V
3 motor switches : green is test mode (current fed on fixed 470 Ω resistor on board), other side is normal mode (servo mode)