

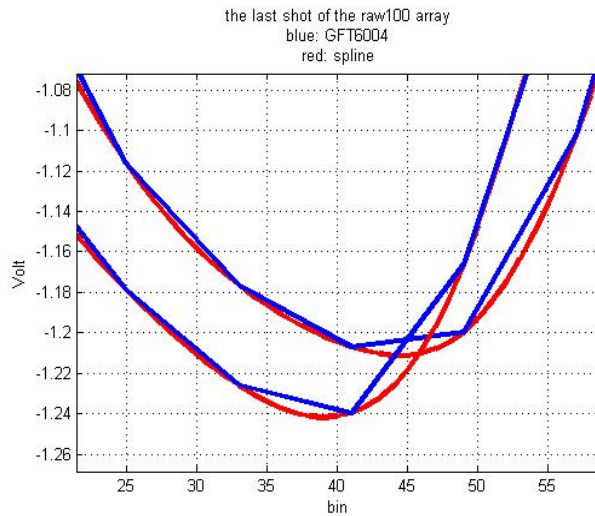
$$\text{'position'} = R_{\text{eff}} \cdot [(V_1 - P) - (V_2 - P)] / [(V_1 - P) + (V_2 - P)], \quad R_{\text{eff}} = 9\text{mm}$$

Expected resolution estimation:

Dif-Sum BPM: DifGain = 14dB resolution = 1 μ m

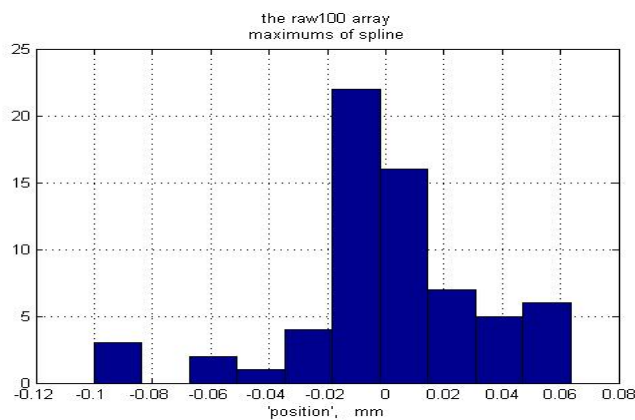
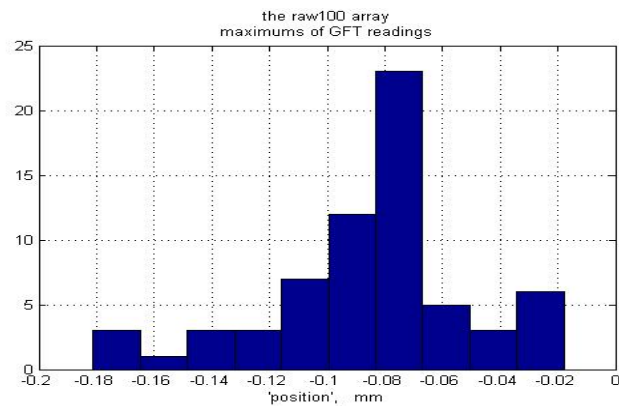
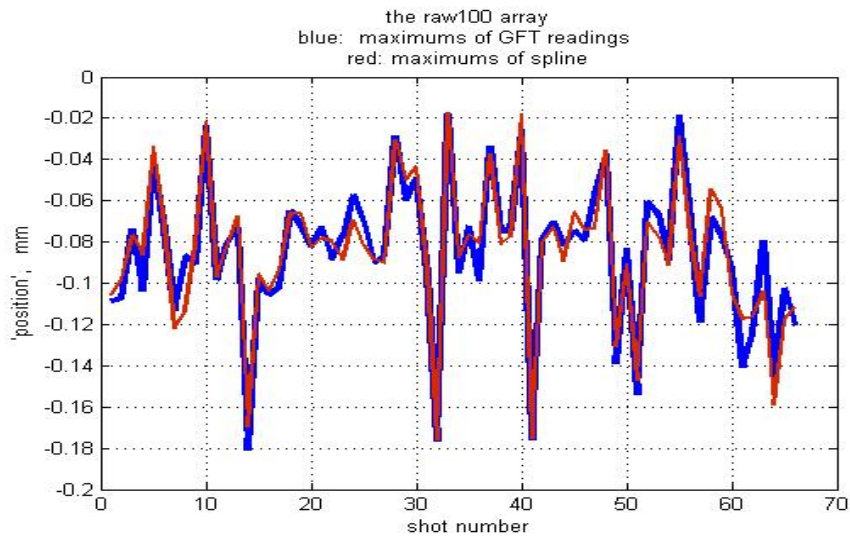
Multiplex BPM: Gain = 1 resolution \rightarrow 1 μ m \cdot 5 \cdot sqrt2 = 7 μ m

Maximums of GFT readings (blue) and maximums of spline interpolated pulses (red):



Maximums of GFT readings: mean = -0.085mm; std = 0.036mm
 maximums of spline interpolated pulses: mean = -0.085mm; std = 0.033mm

0.033mm = 9mm \cdot A \rightarrow A = 3.7E(-3), Sum = 2.4V, std = 9mV!
 0.007mm stdV = 2mV



Effects:

1. Some systematics: amplitudes of the spikes are close each to other.
2. Interpolation error.
3. A pedestal noise stdP = 1.4mV (compare to 0.6mV in the Dif channel).
4. The two pulses overlap (GFT amplifier)

Synchronous ADC!