

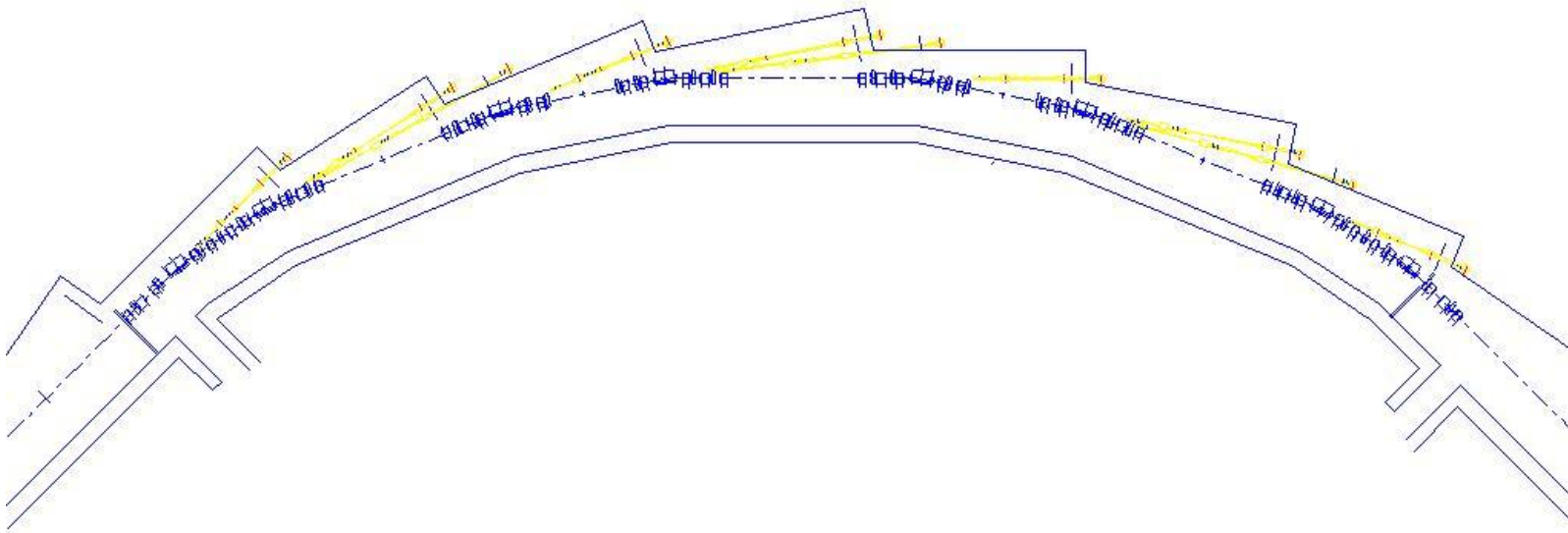
# HLS calibration at SOLEIL

*Synchrotron SOLEIL*

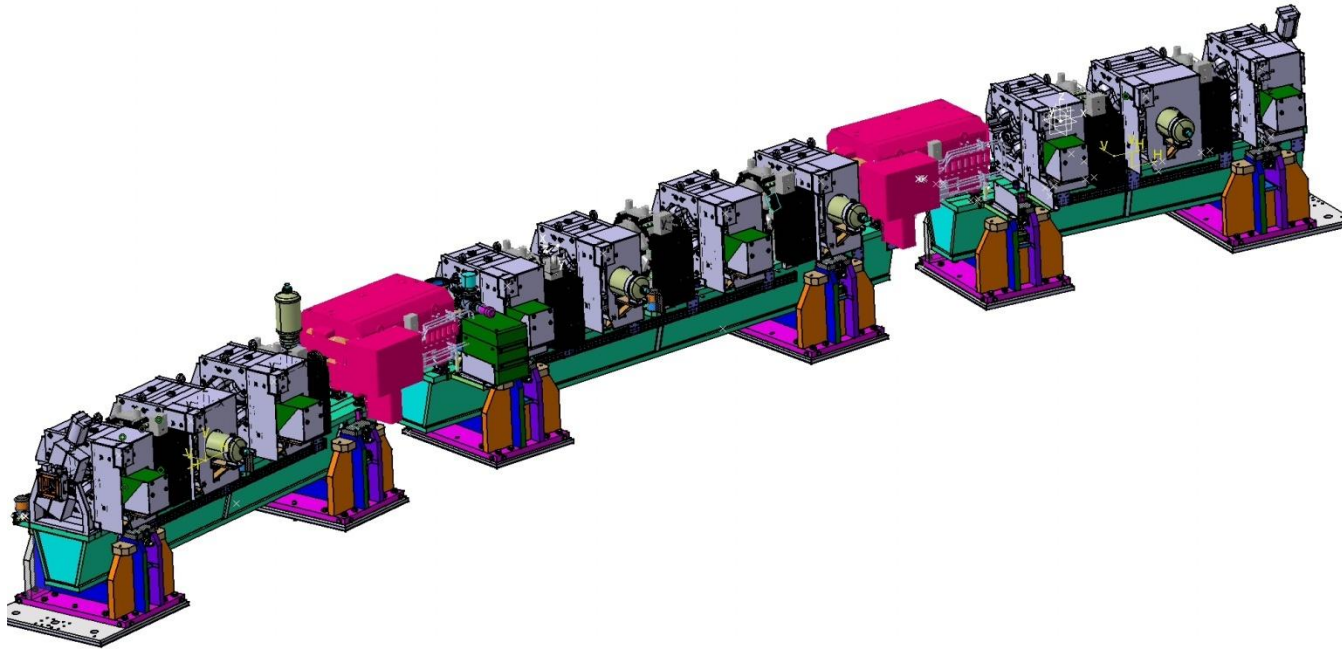
*Saint-Aubin, Gif sur Yvette, France*

# Storage Ring

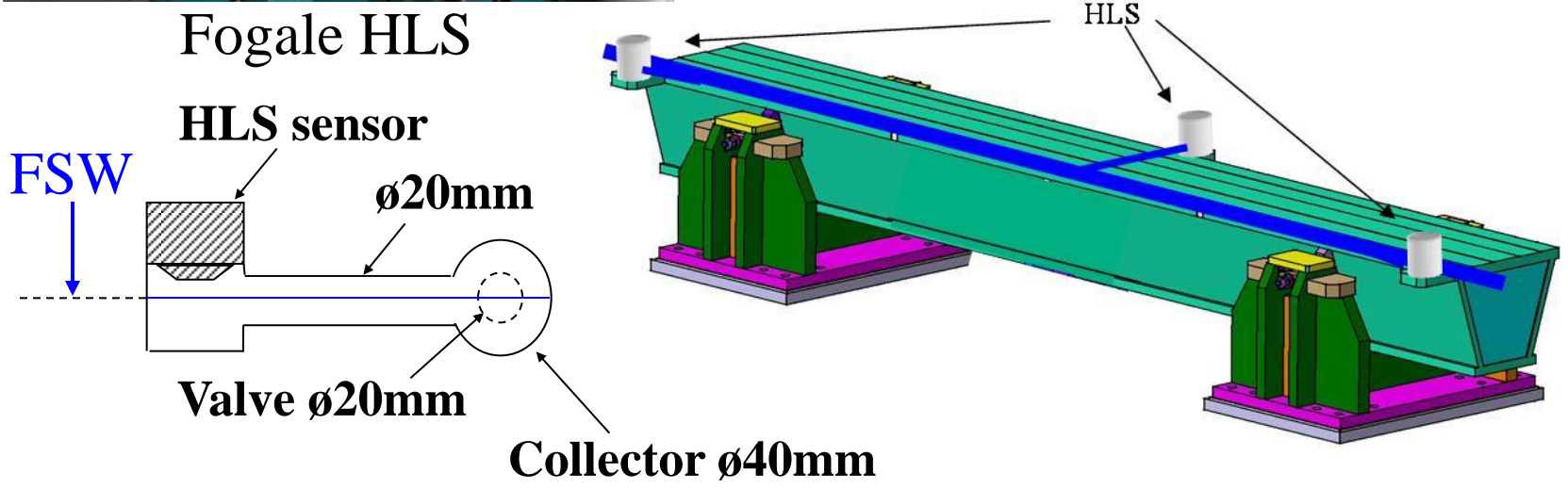
- 160 Qpoles, 120 Spoles, 56 girders, 24 straight sections,
- 354m circumference



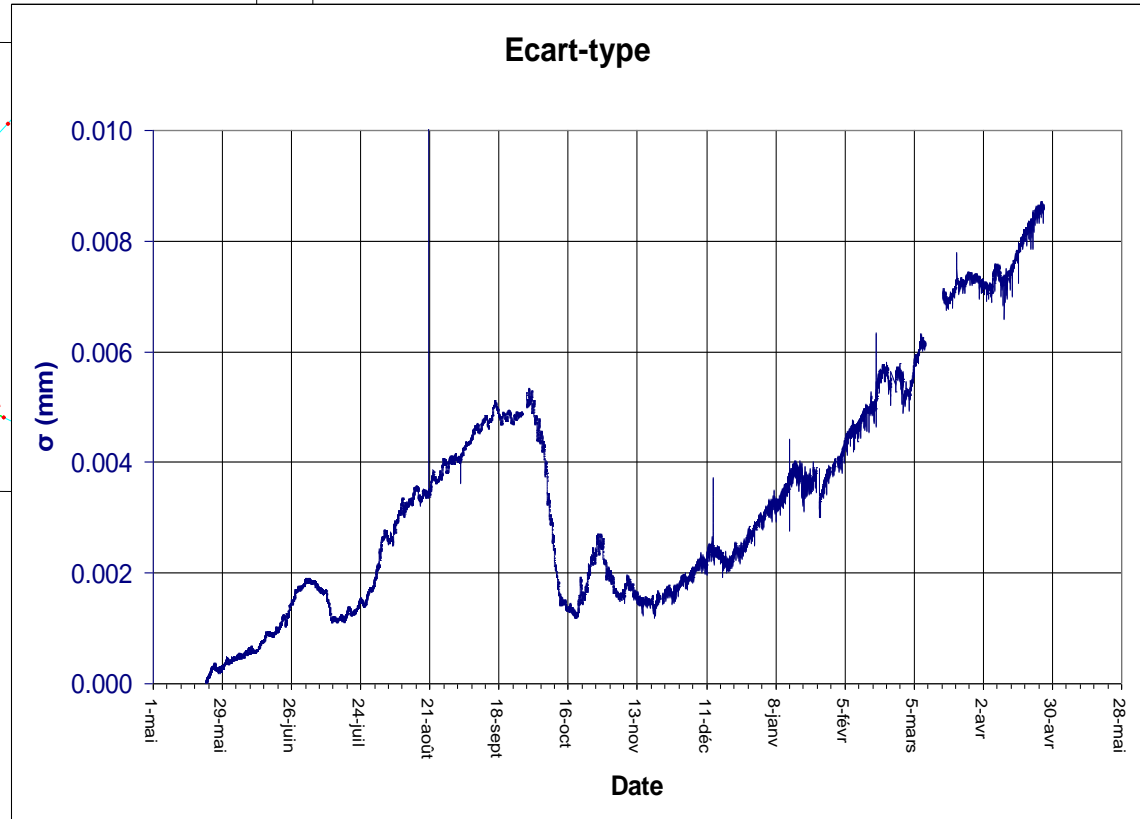
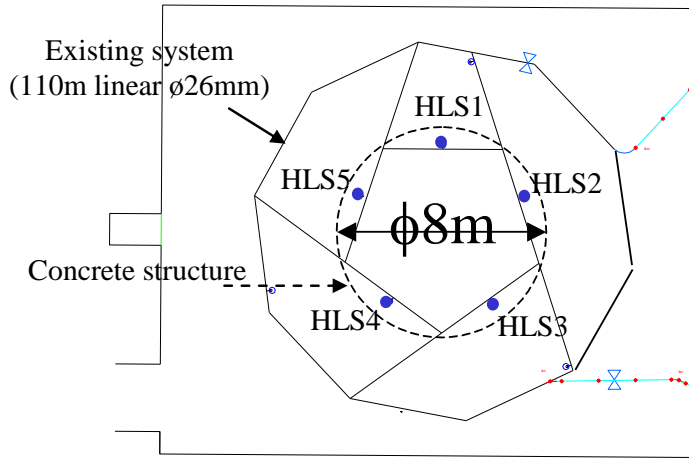
# Storage ring Cell



# Altimetry: HLS network



# Preliminary Stability tests



-STCelec = (10 $\mu\text{m}$ , 1 year)

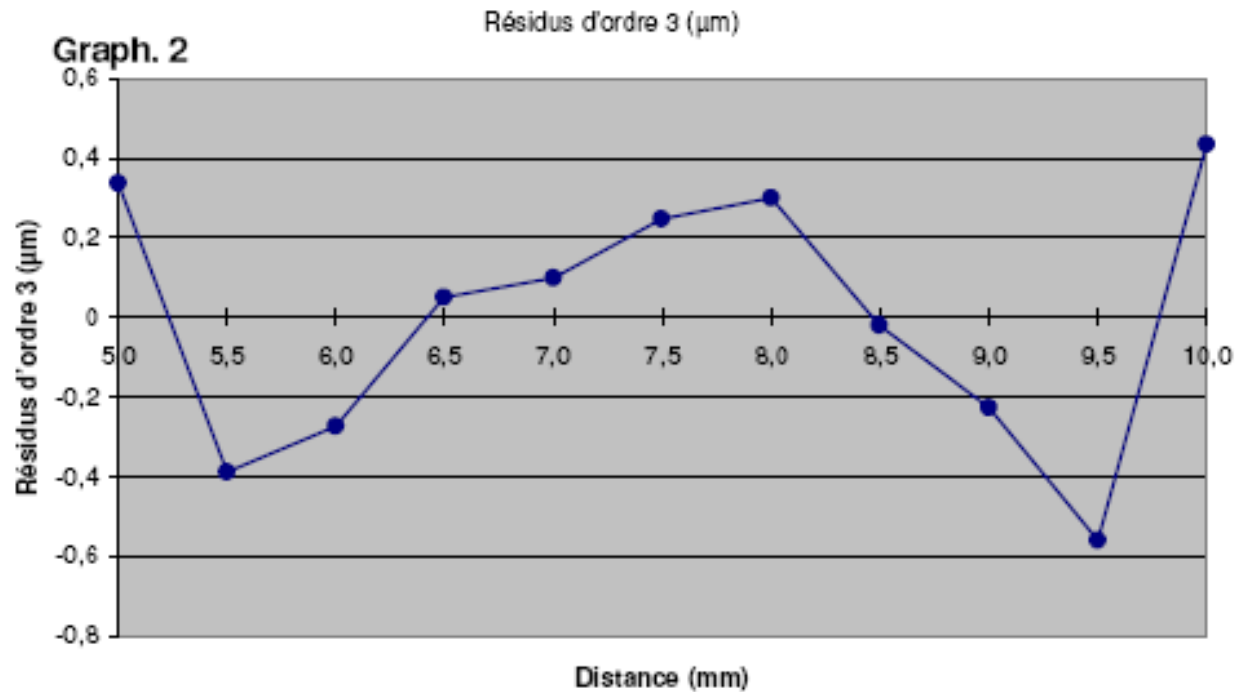
-Worse case since it integrates electronics, mechanical mounting (& slab twist)

# 3st order linearization

Linéarisation du 3<sup>o</sup> ordre

Coefficients de régression du 3<sup>o</sup> ordre (équa. 1)

$$d = 4,9997 + 0,49034 V - 0,000511 V^2 + 0,0001481 V^3$$

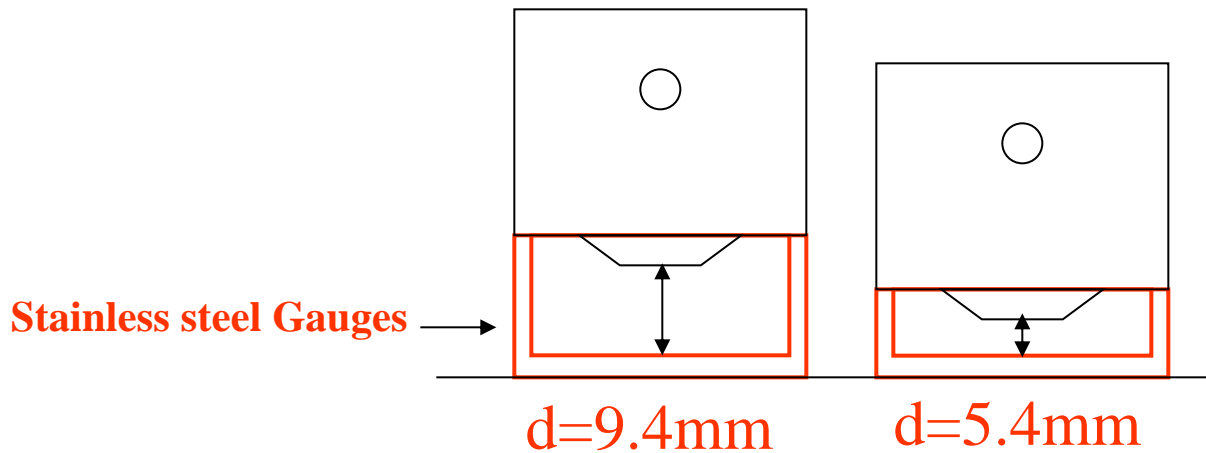


## sensor with a gauge:

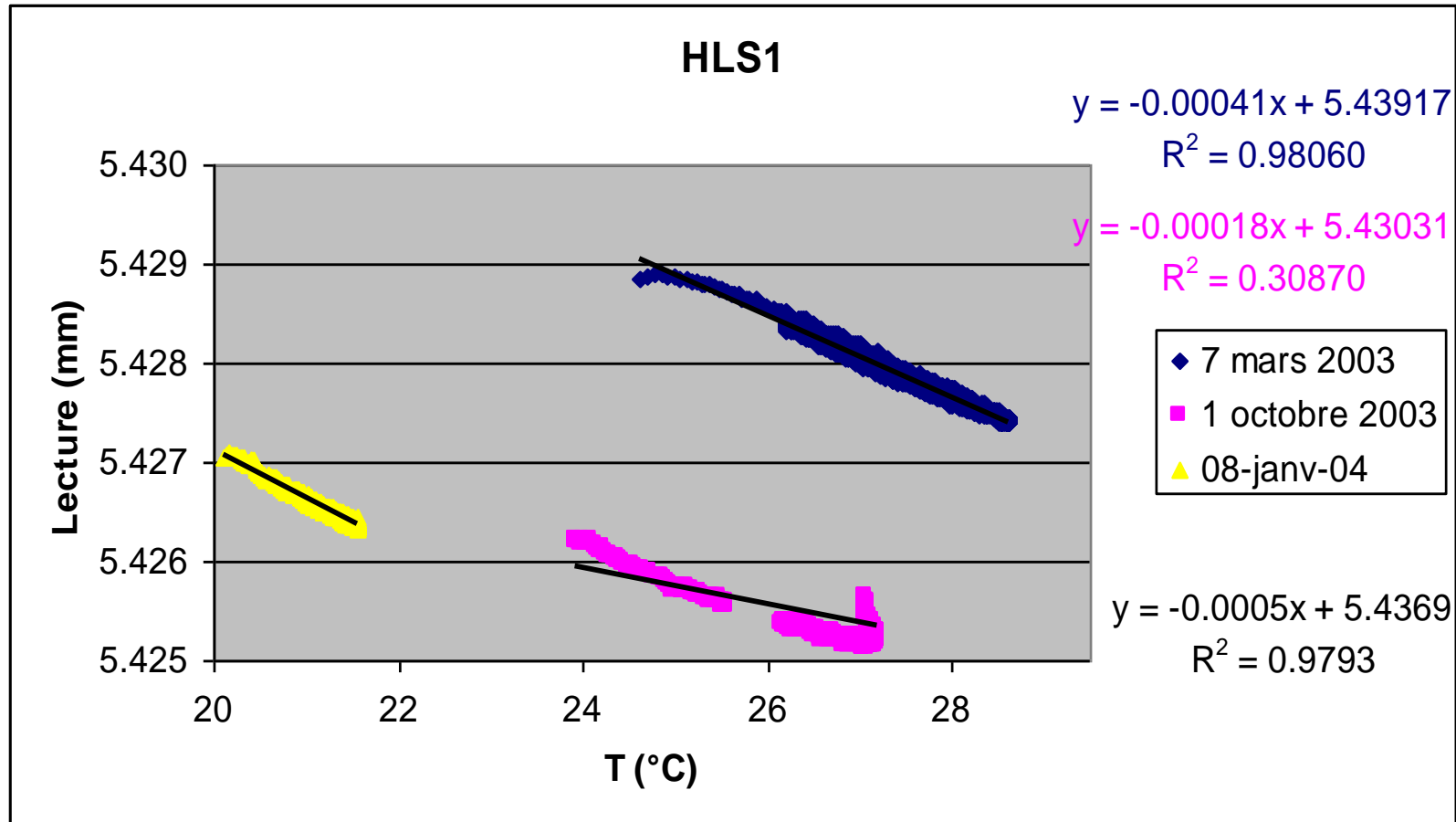


Sensor: range from 5 to 10mm

Stainless steel Gauge

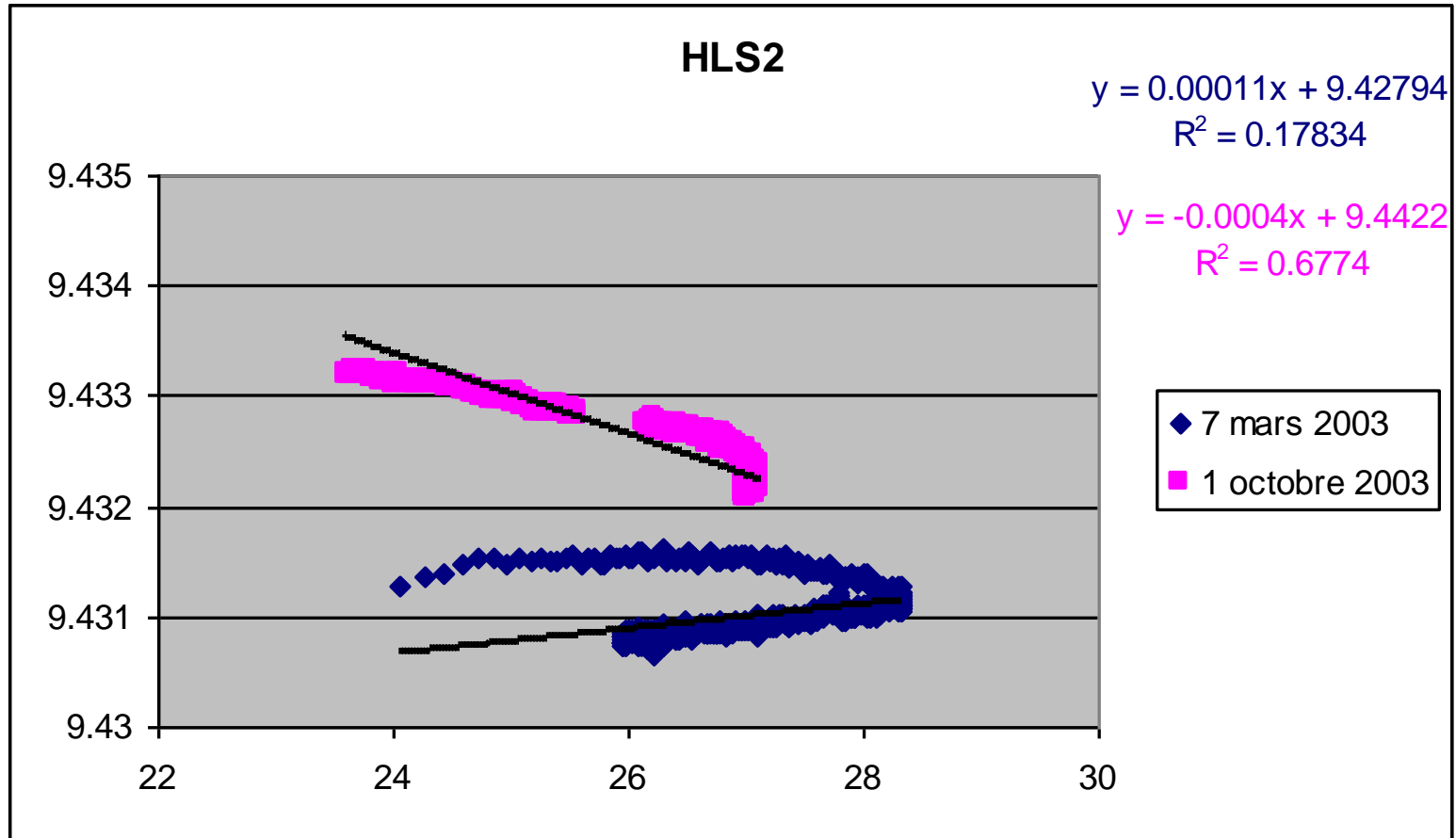


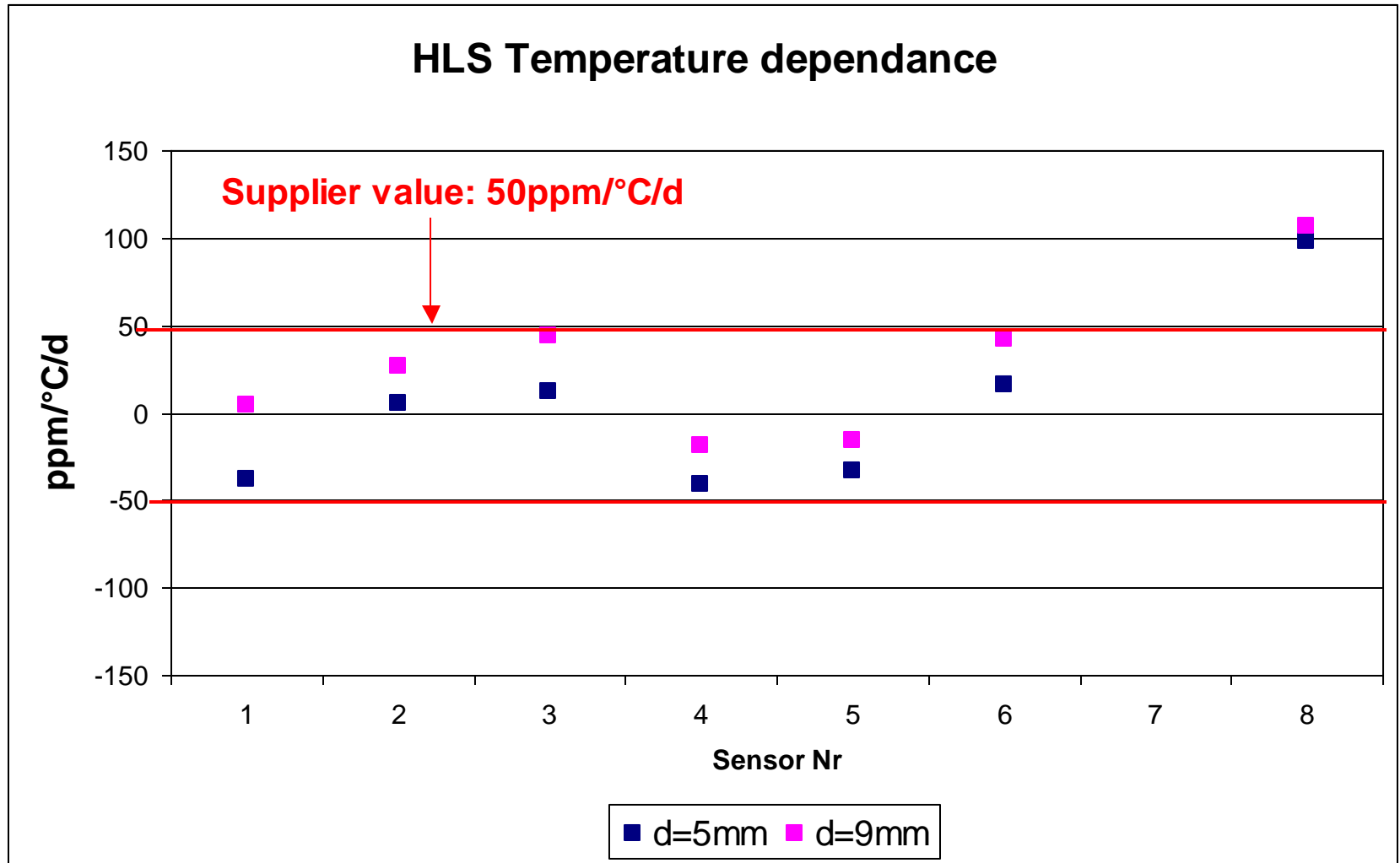
# Temperature dependance





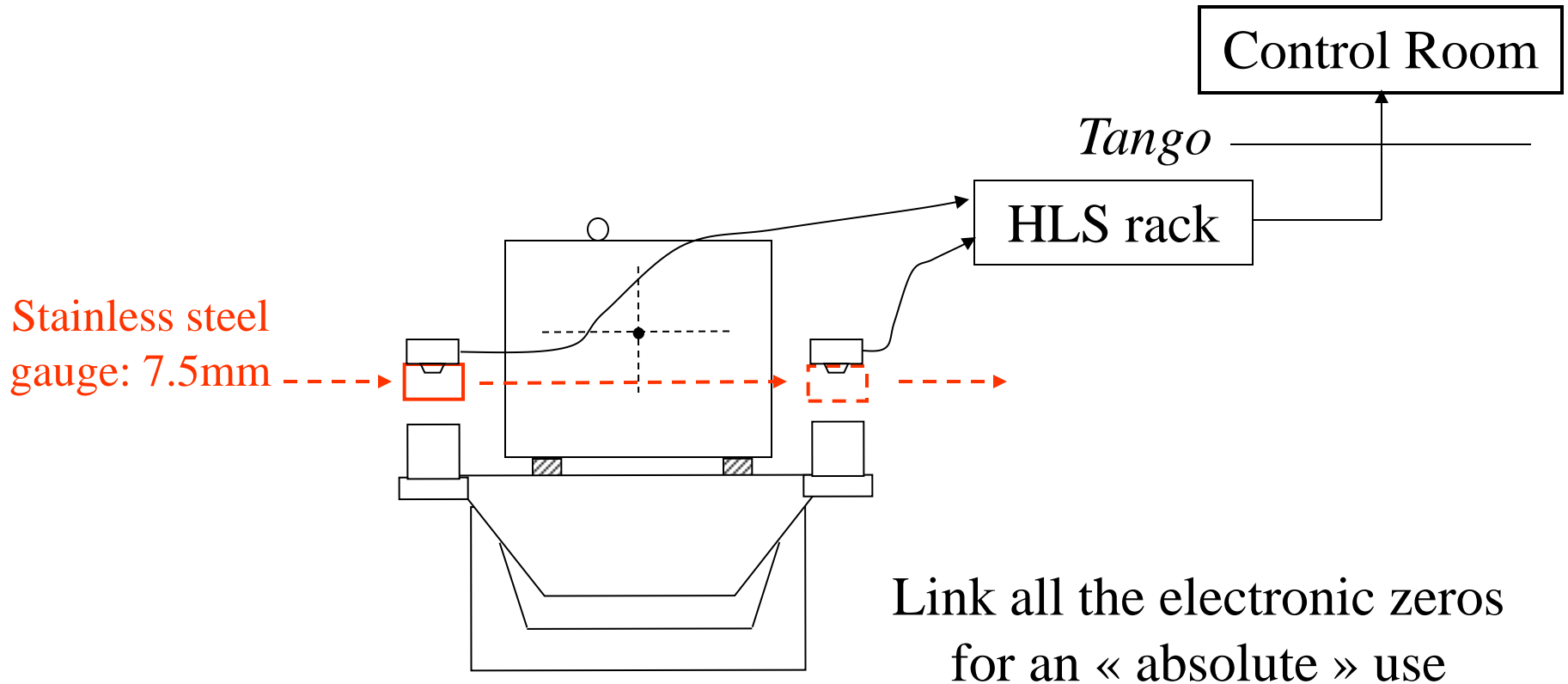
# Temperature dependance



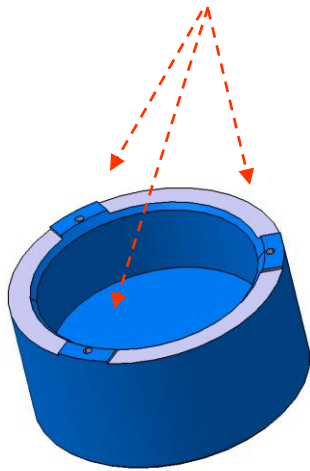


# In situ Calibration of HLS zero

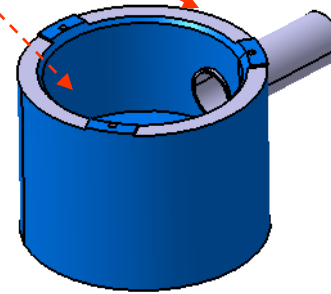
Once a year:



3 machined areas for  
contact with sensor



Gauge



Vessel

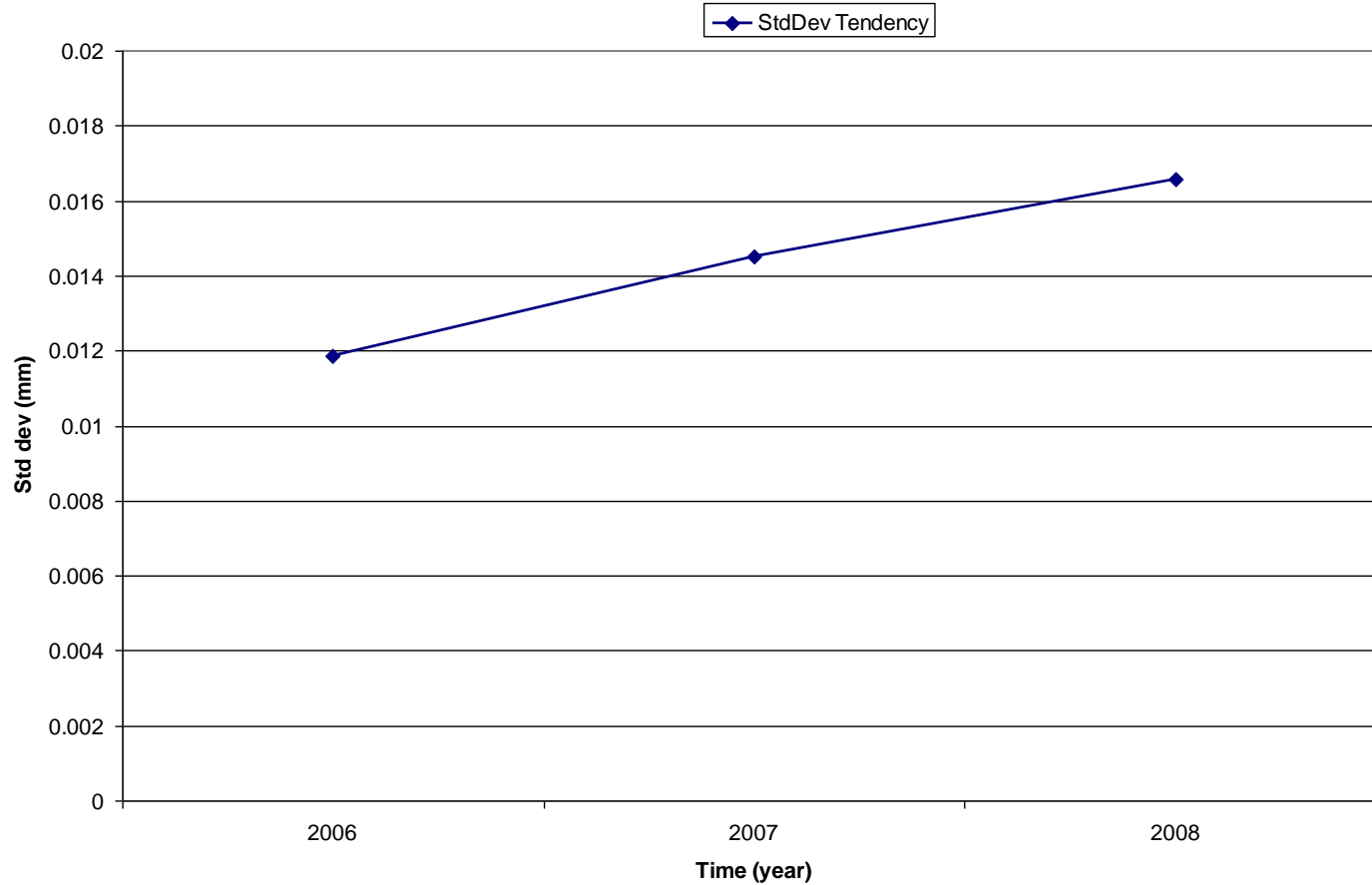
# HLS zero evolution

HLS zero evolution

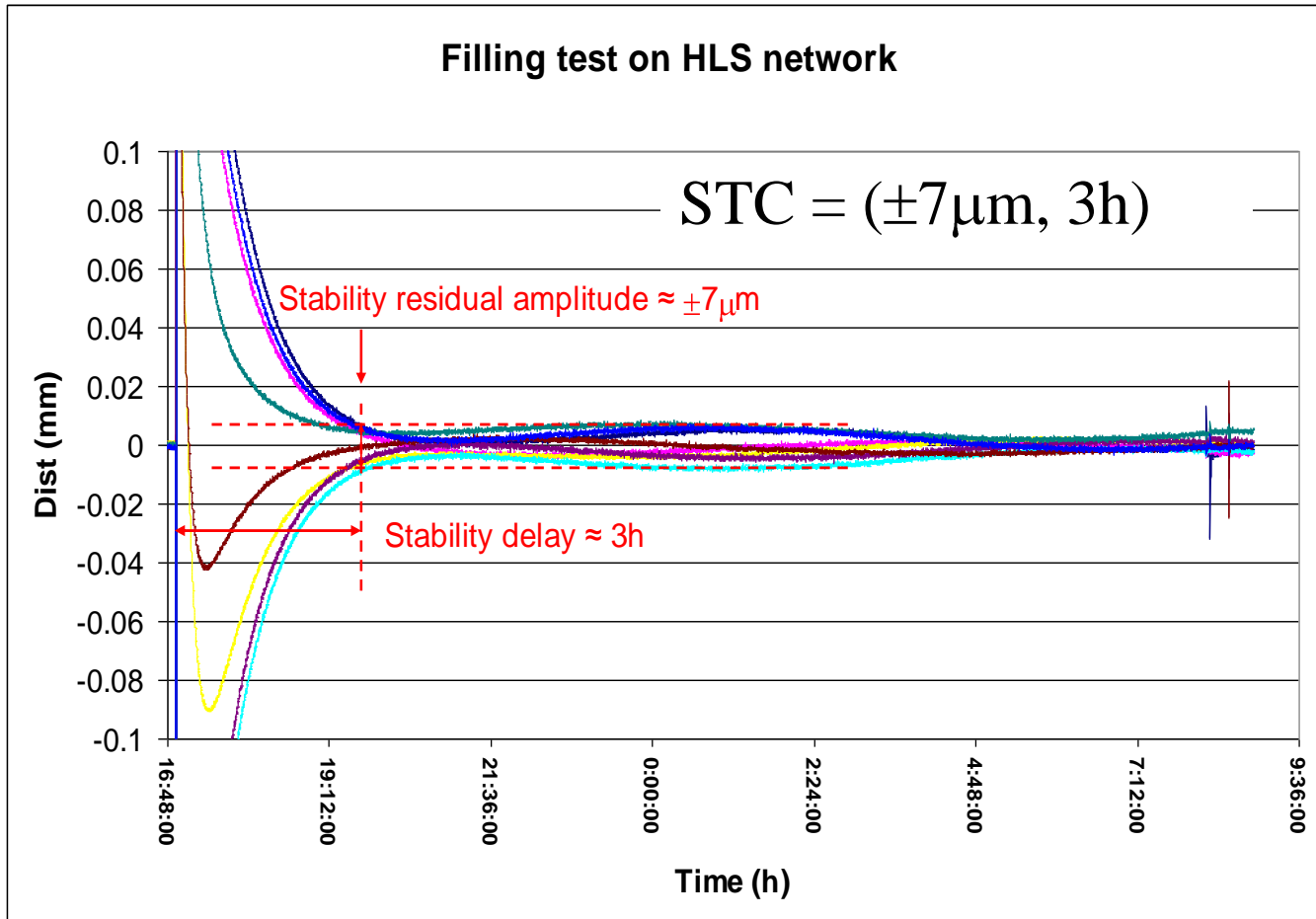


# HLS zero evolution: standard deviation

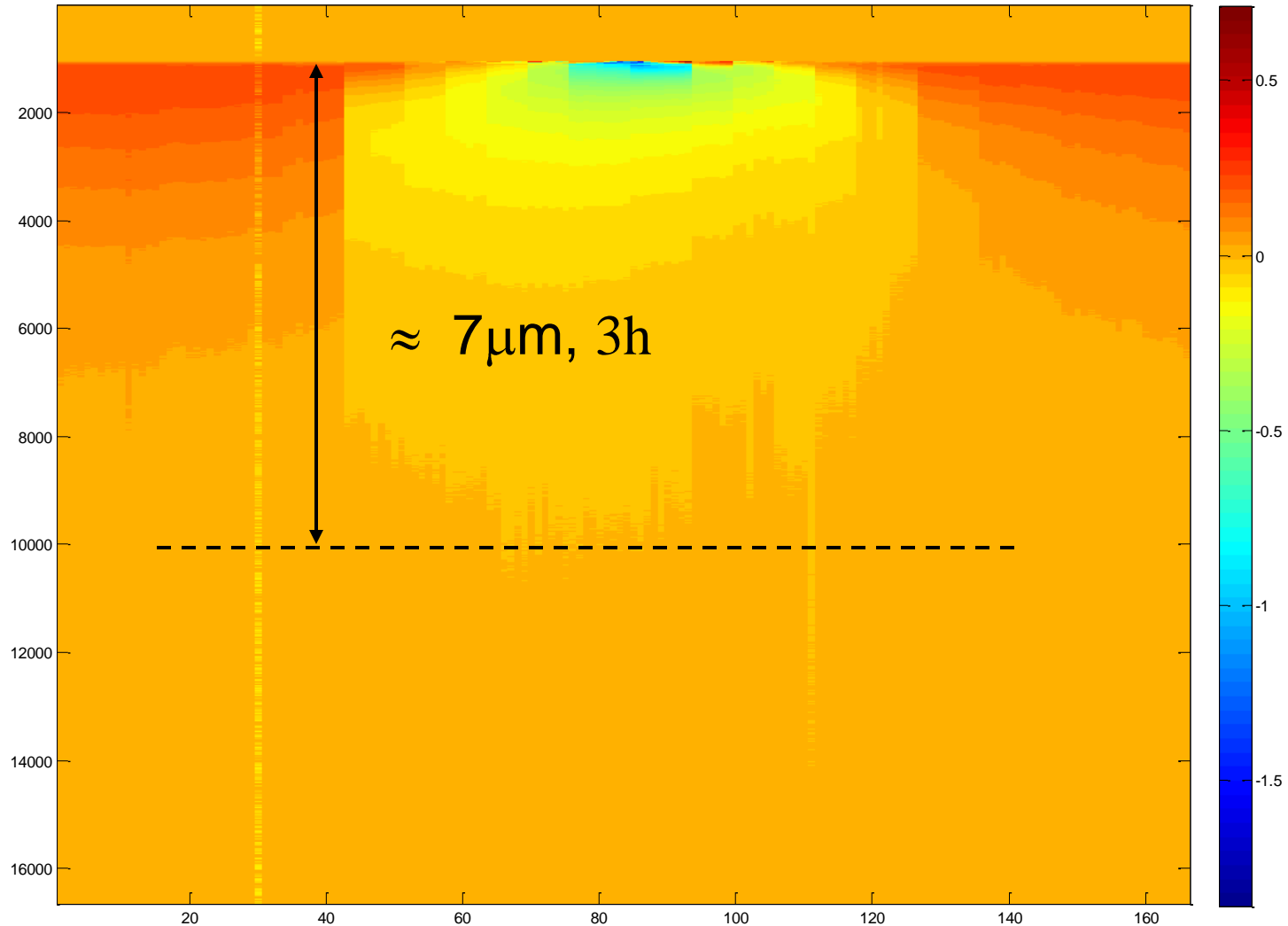
HLS zero evolution: StdDev Tendency



# Stability of the Free Surface of Water

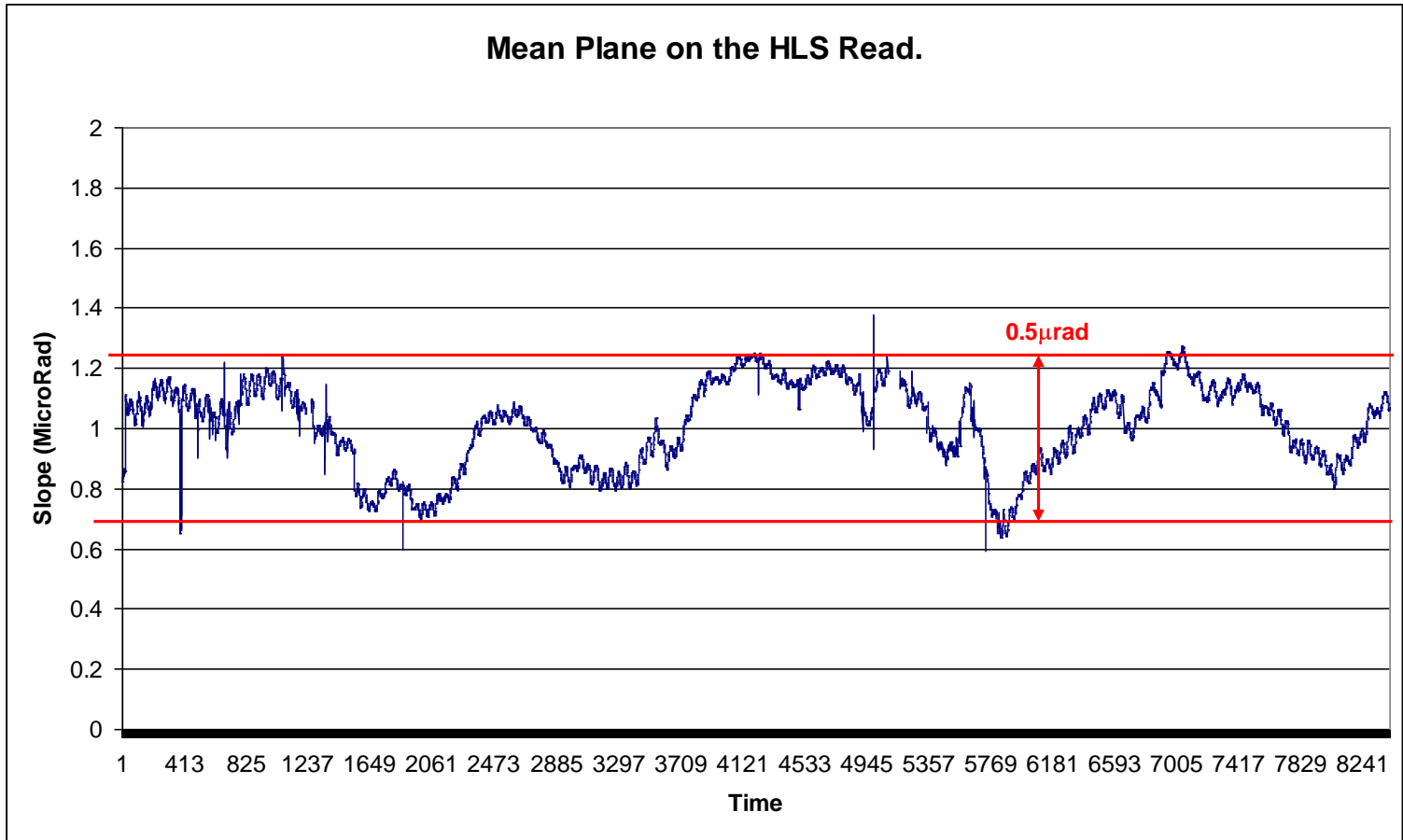


# Stability of the Free Surface of Water





# Slope of the HLS Mean Plane (tidal effects)



$\approx 3$  months

- **Use of the calibration curves from the supplier**
- **Check of the temperature dependance**
- **Check of the slow drift of the sensors by the mean of the gauge**
- **Stability (or repetability) of the system including the water**