Capacitance Tomograph for Dynamic Process Imaging

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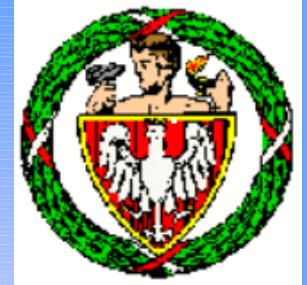
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- The aim of the work
  - real time dynamic process imaging
  - configurable work mode
    - 8, 12, 16, 32 electrodes tomographic probe
    - 4 planes * 8 electrodes tomographic probe
    - 32 electrodes capacitance meter
- Tools
  - modern instrumentation amplifiers
 - programmable logic devices

Capacitance Tomograph Modular Design
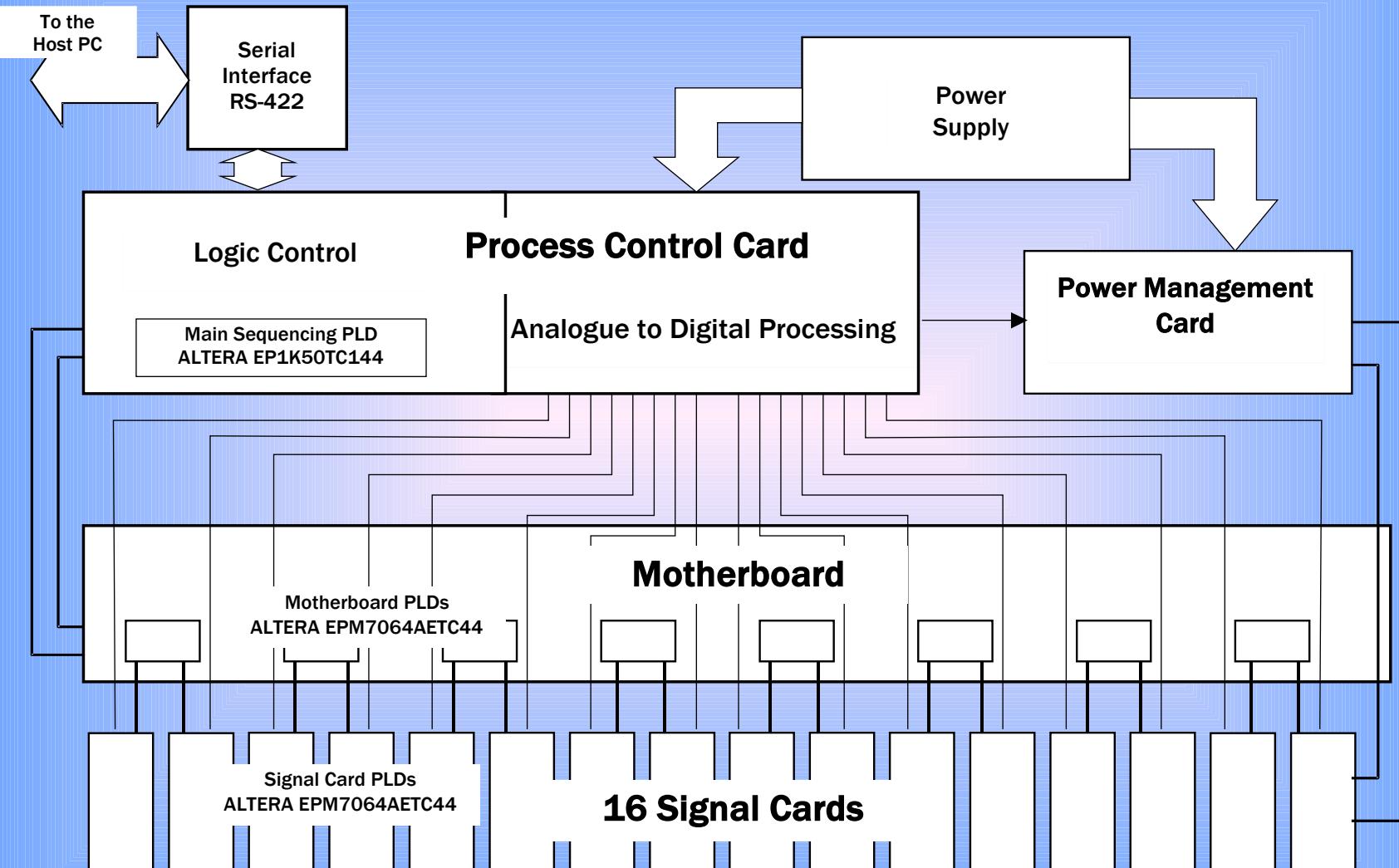
Signal card schematic diagram

Size: C FCSM No. DWG No.: 0 Rev: O.K.

Scale Sheet 2 of 4
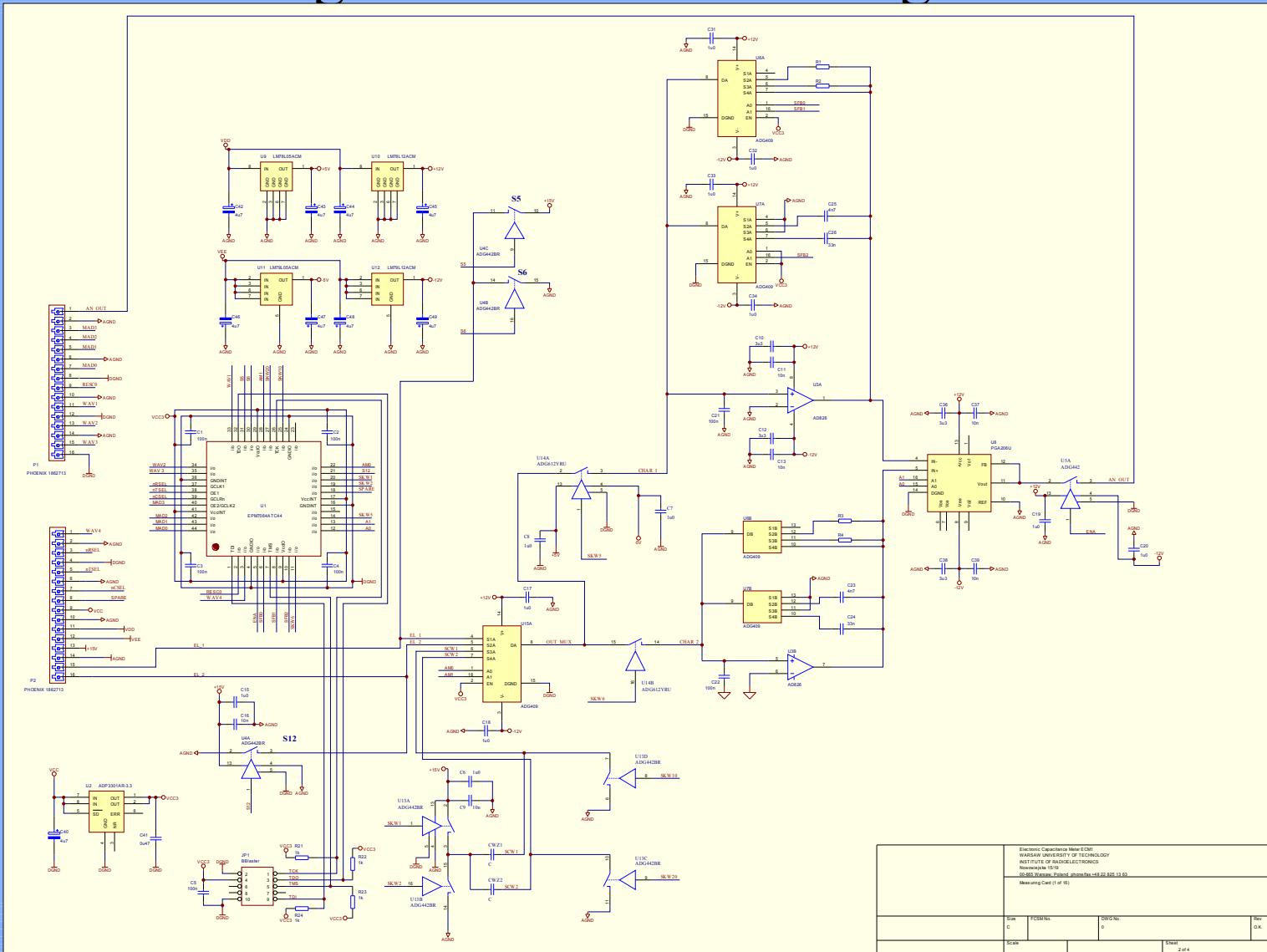
# Capacitance tomograph – ET2
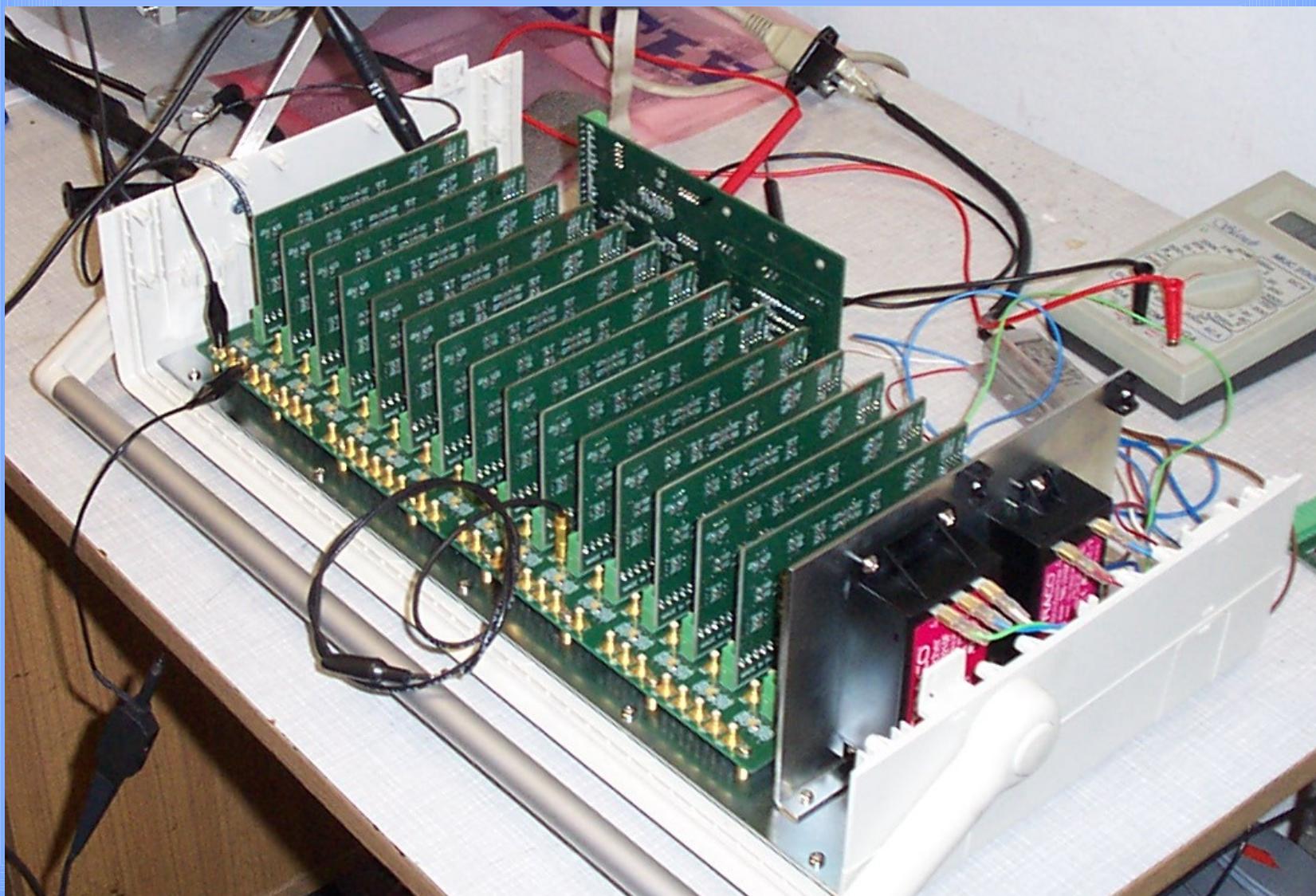
Sensors
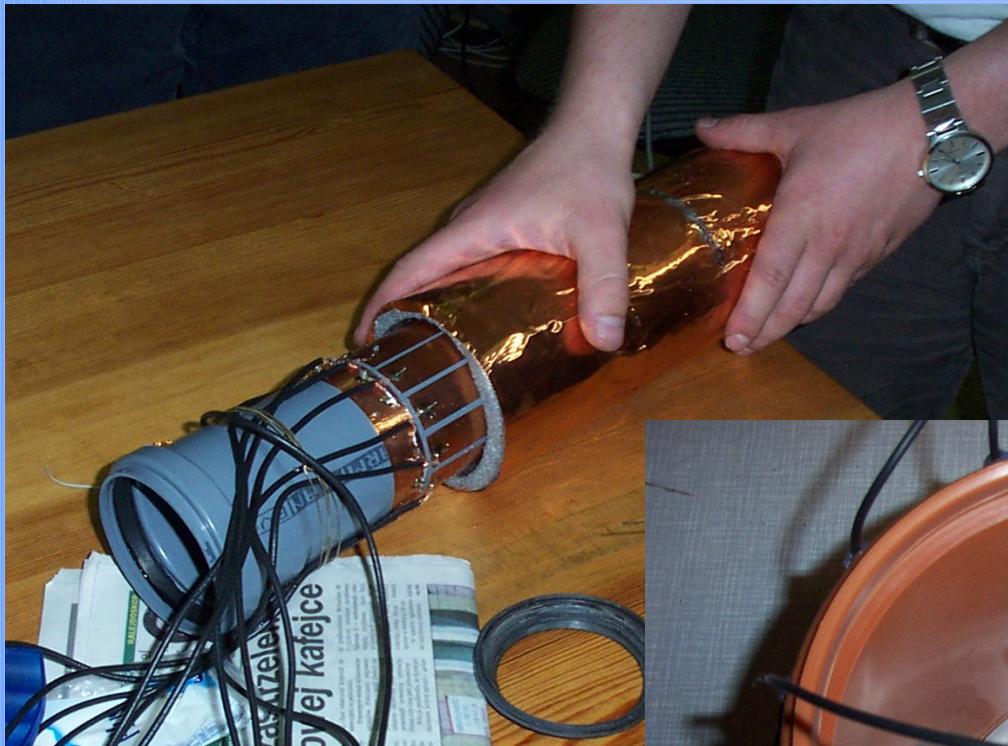
Measurement error in channel
std/avg[%]
measured value = 3,3 pF,   N = 100
avg - average value from N=100 measurements,
std - standard deviation
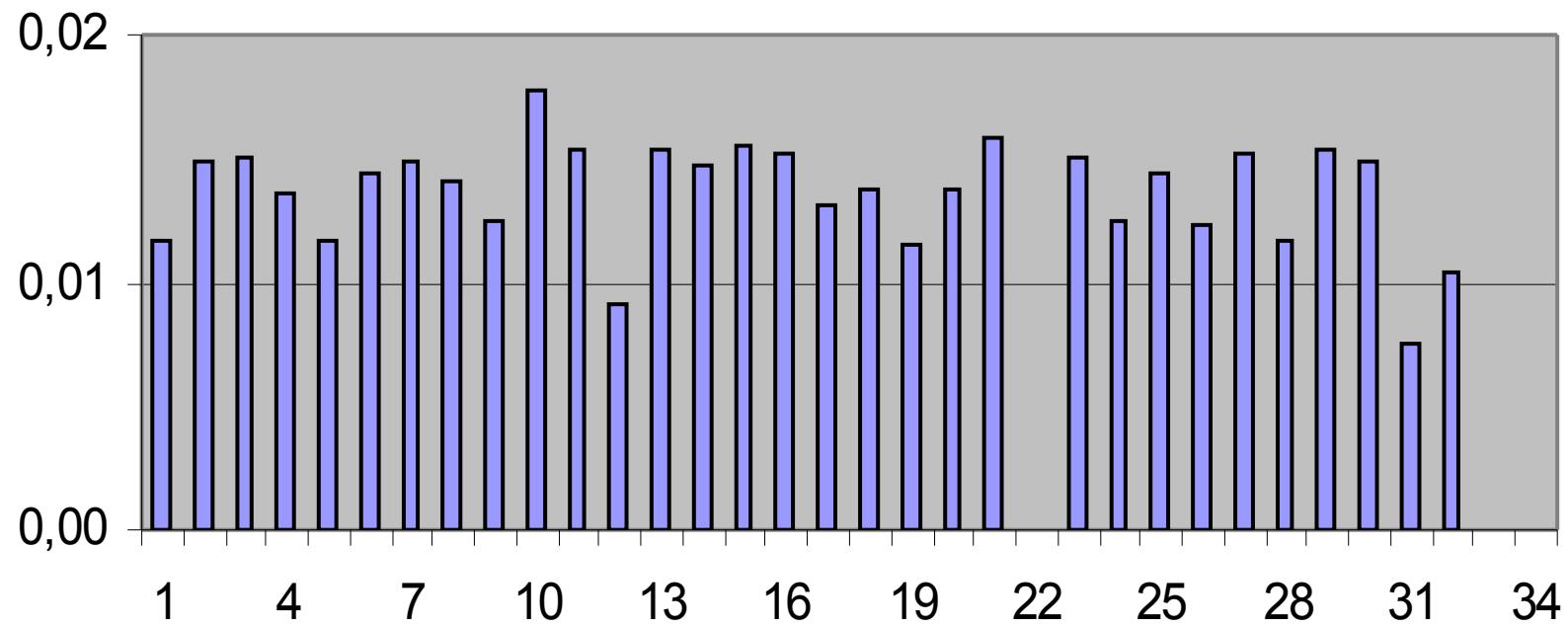
ET2 software main window
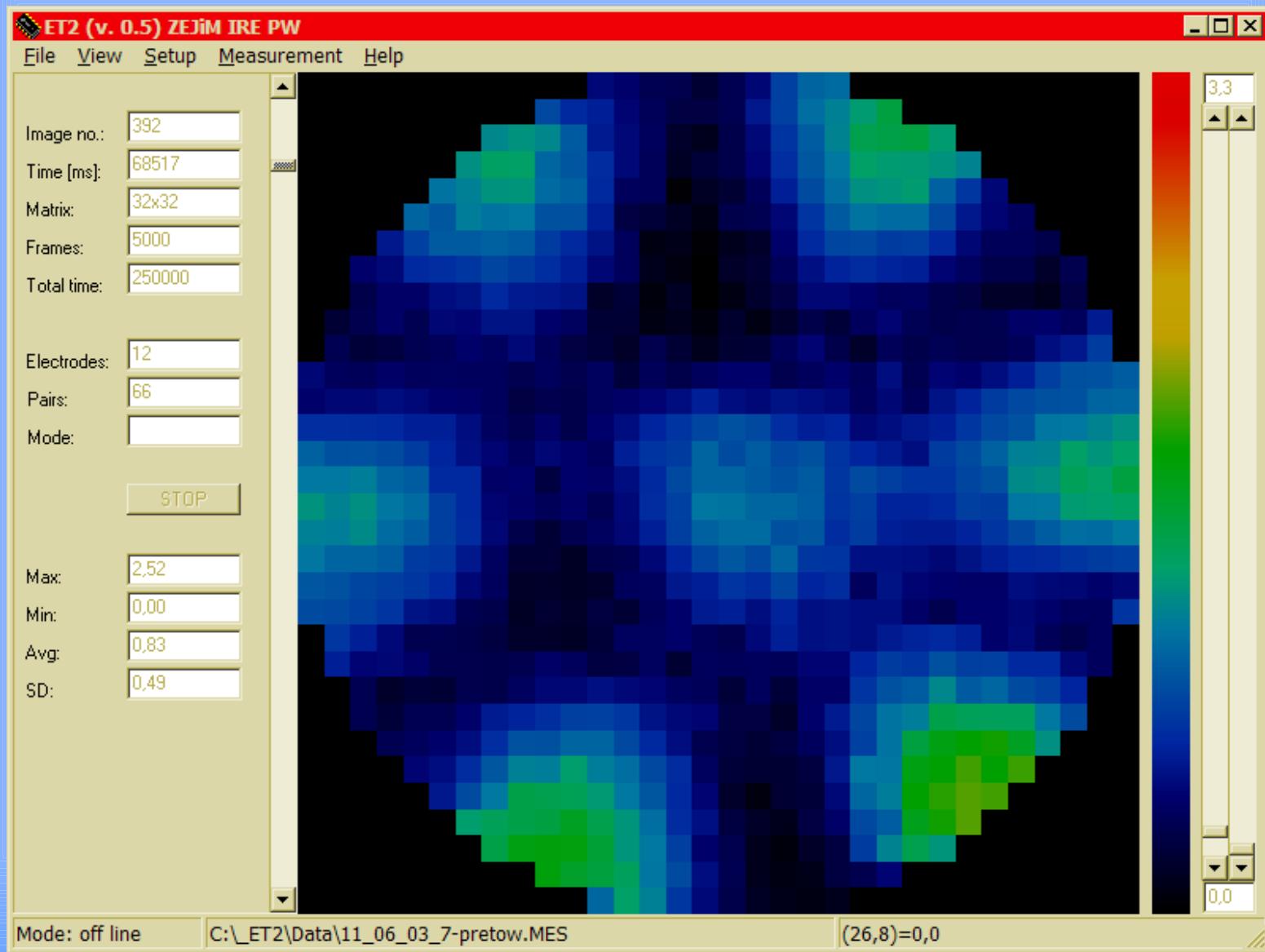
Images from the ET2 tomograph
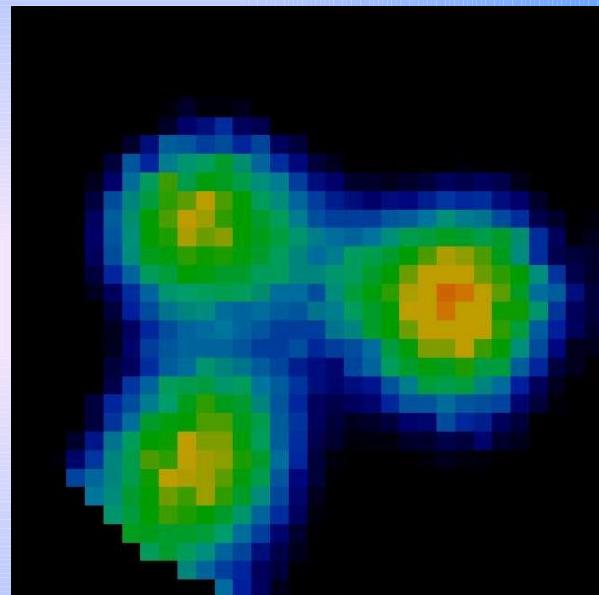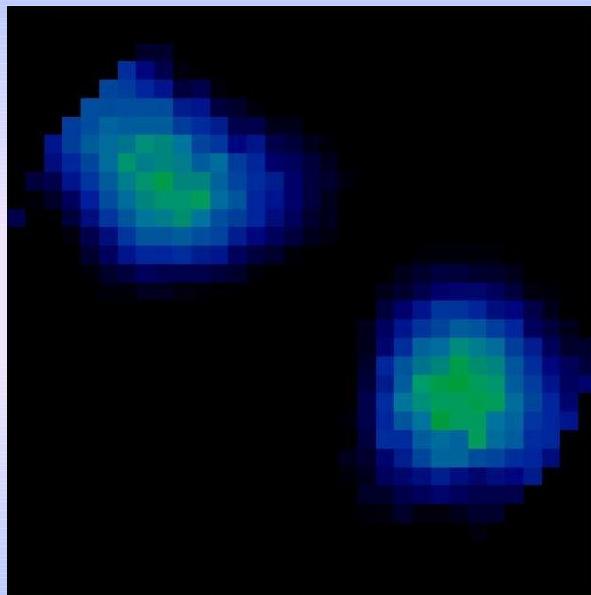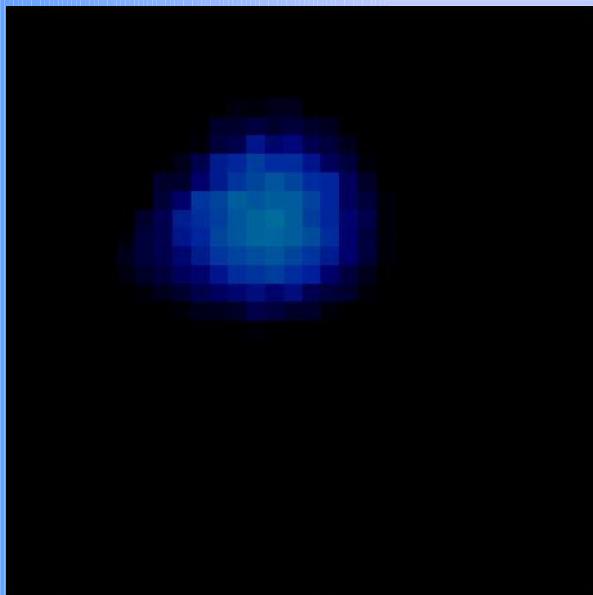
One, two and three Teflon rods.

Flow images of oil in a shaken probe
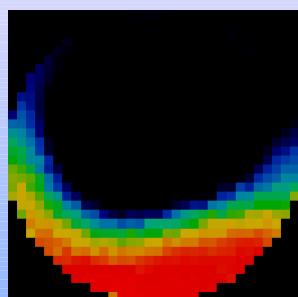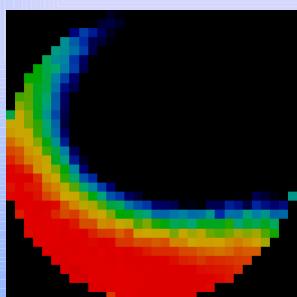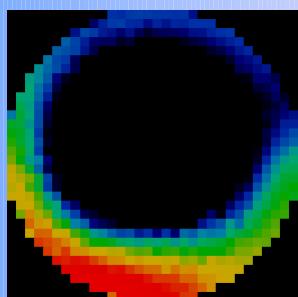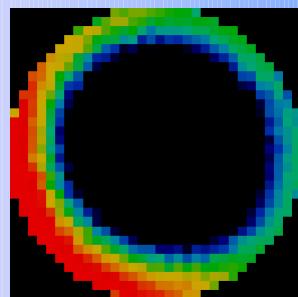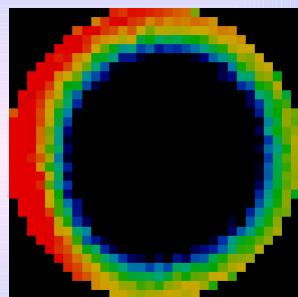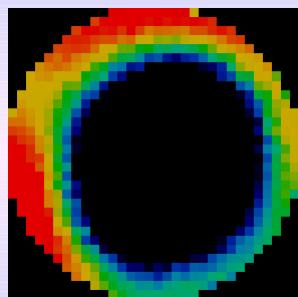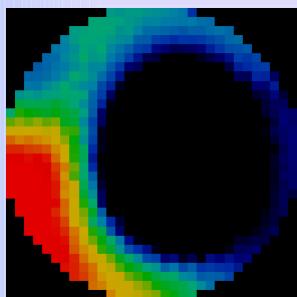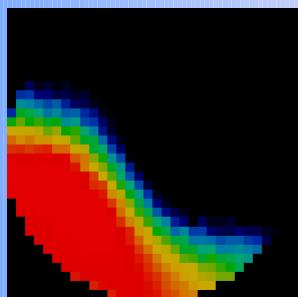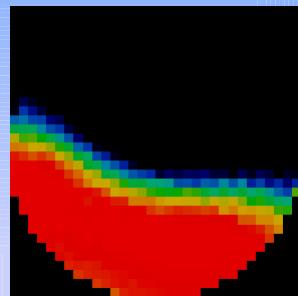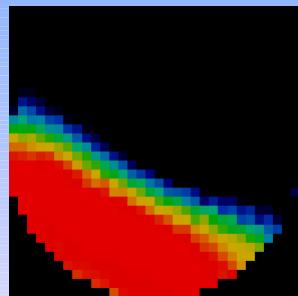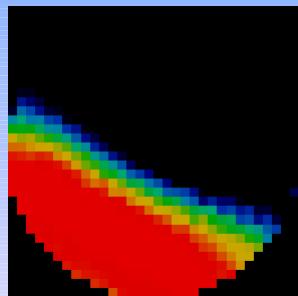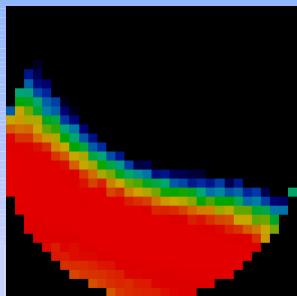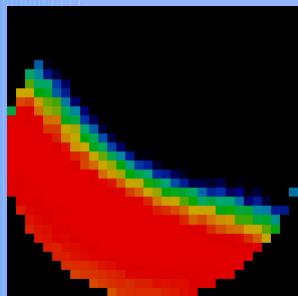
Images of 7 rods
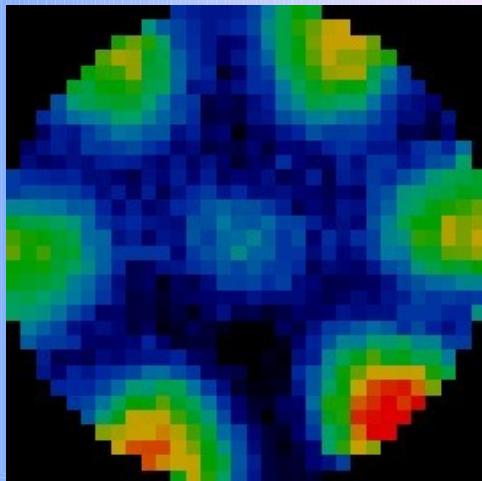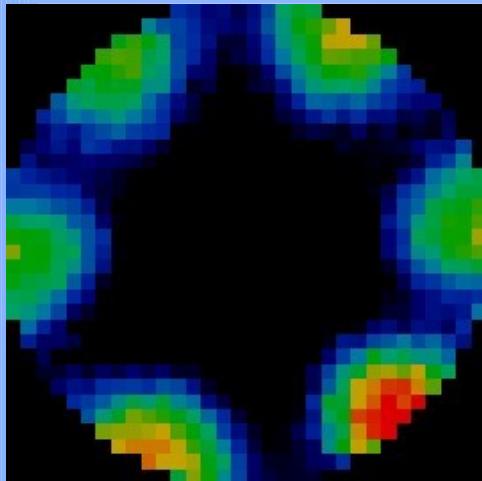
Conclusions

- real time dynamic process imaging   (300 frames/s)
- reconfiguration for different work mode

Future work

- optimisation of a capacitance measuring circuit to achieve improved signal to noise ratio
- controlled amplification for electrode pairs
- iterative algorithms for image reconstruction to improve image quality