The digital monochromator stabilization system SIS 2900

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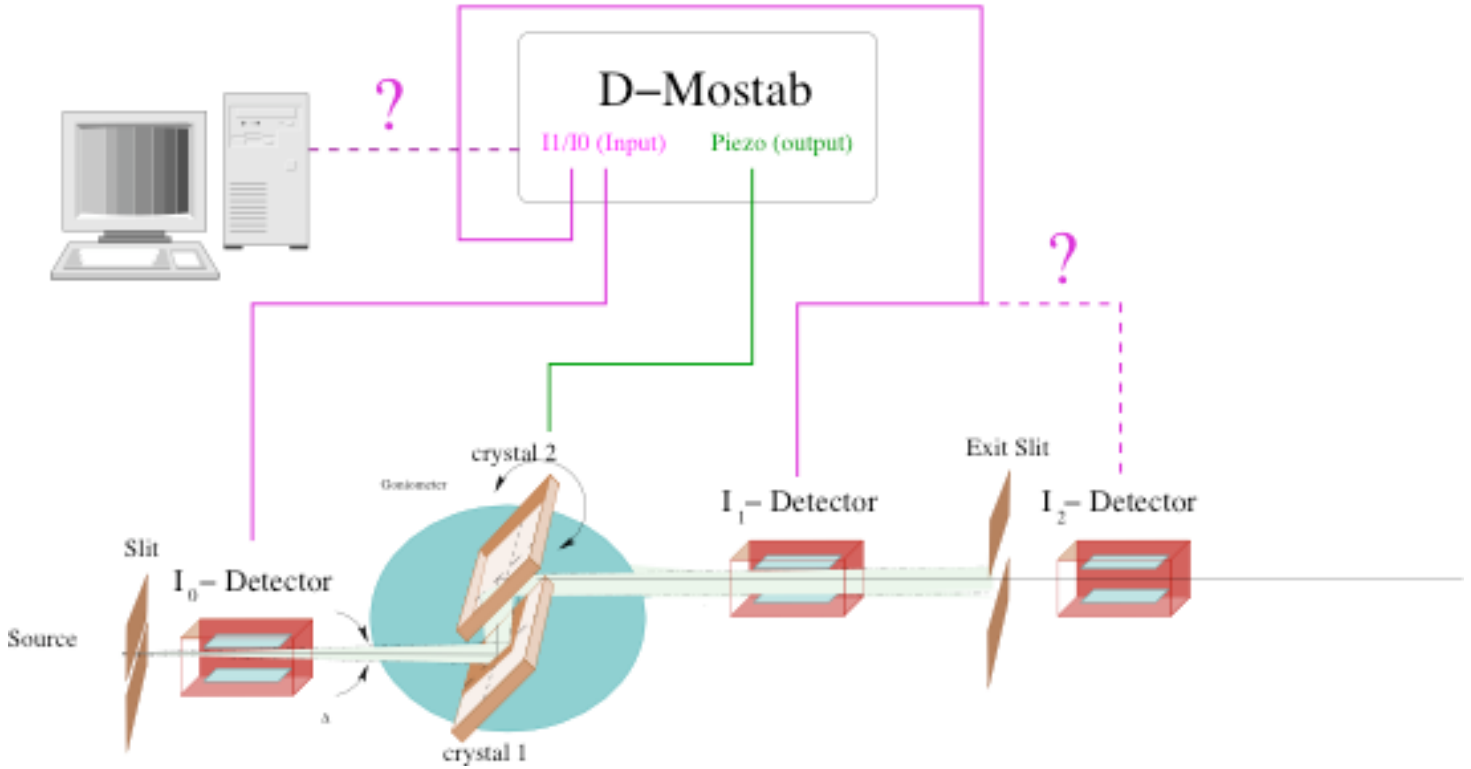
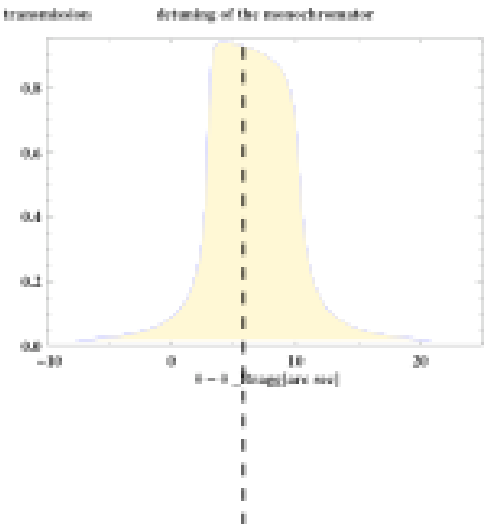
Introduction:
The Feed-Back-System



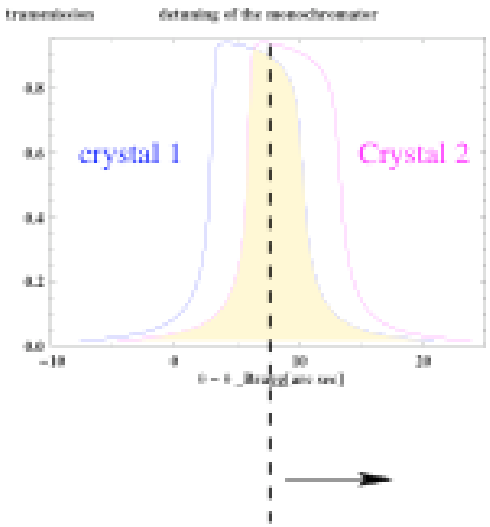
- Constant Transmission?
- Why digital Mostab?

The Monochromator
The Effect of Detuning

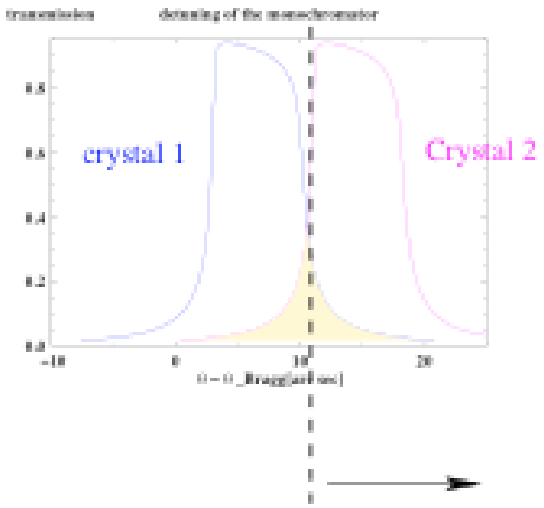
Detuning by 0 arc sec



Detuning by 3 arc sec

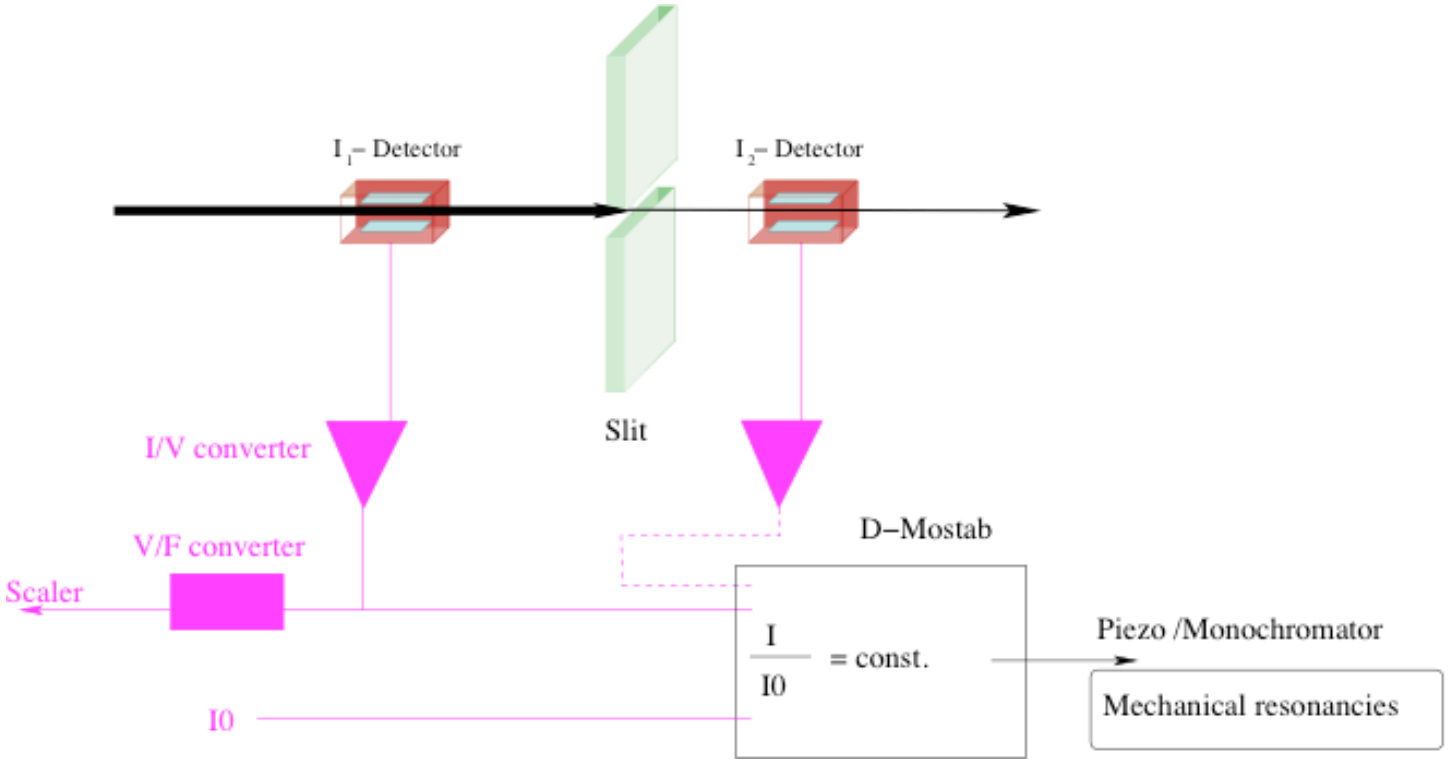


Detuning by 8 arc sec



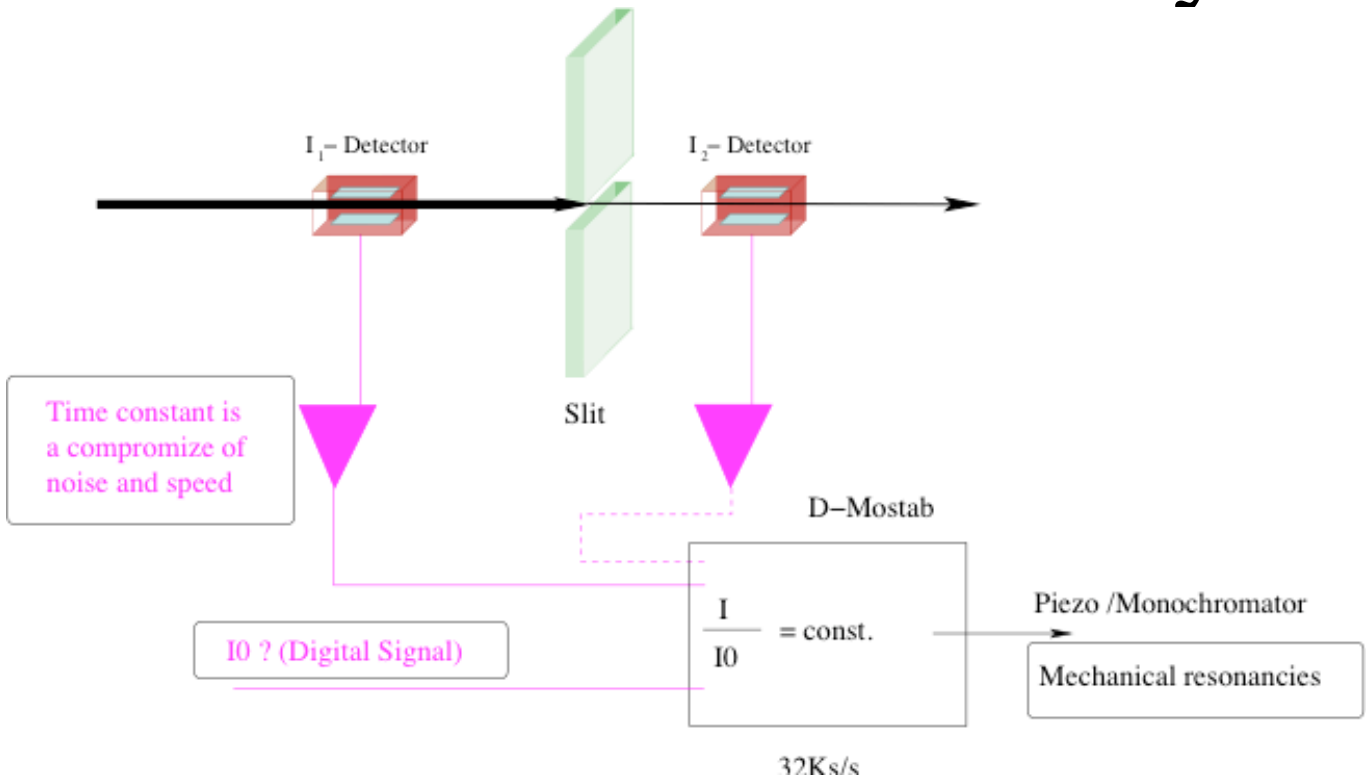
- Detuning is shifting the energy (range of 0.1eV)
- Detuning is changing the beam position (vertical)
- Detuning is suppressing the higher harmonic contribution

The Detector: What is Constant?



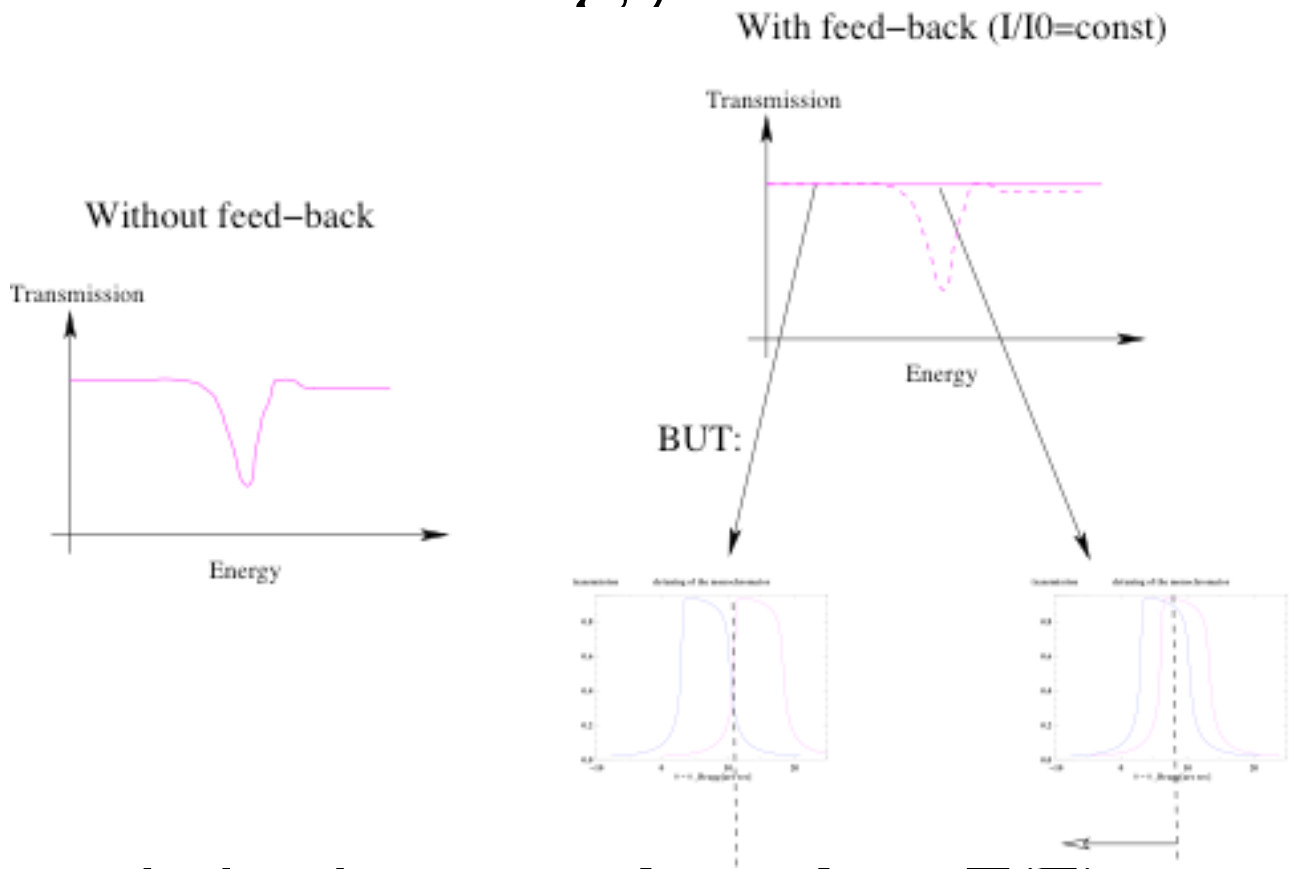
- Three Modes:
  Total Intensity: “Constant energy mode”
  Intensity after slit: “Constant beam position”
  Maximal Intensity

The Time Constant of the System



- Sources of Noise:
  - Ground loop
  - Mechanical resonances (20Hz-1KHz)
  - Microphony…….

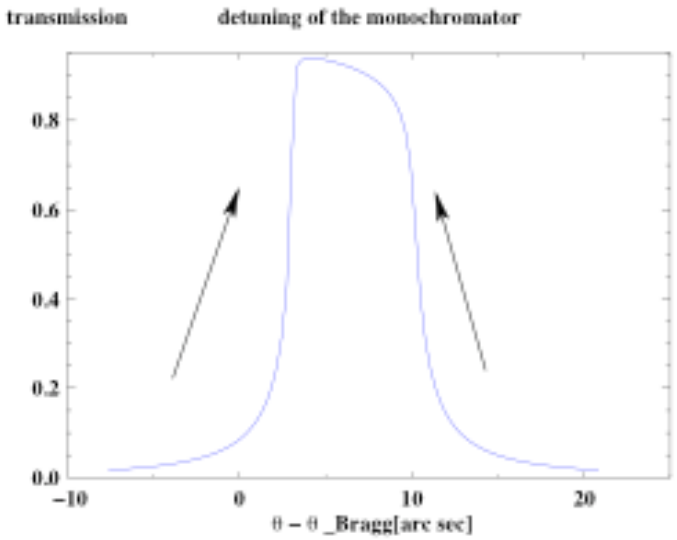
Why Digital Mostab: Energy Scan



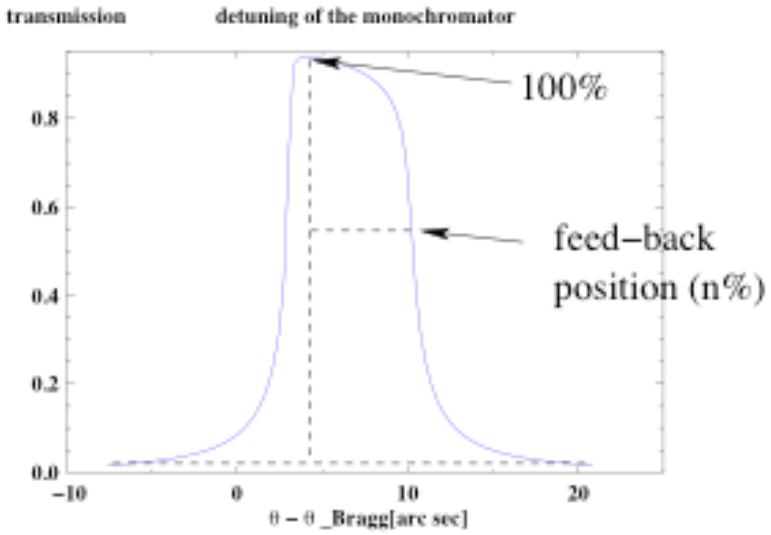
- Transmission is energy dependent: T(E)
- I/I0 must be corrected: I/I0*T(E)
- Can be corrected only by a digital Mostab

The Functionality of the Mostab

First step:



Second step:



- First Step: determination of the peak position
- Second Step: feed-back on one value

Conclusion or "how to setup a Mostab"

- What kind of Stabilization is needed:
  - Constant energy, Constant beam position, maximum intensity
- Defining the required time constant of the feed-back system
- Frequency analysis of the beamline
- Removing the sources of noise!!!!!
- Adjusting the PID-parameters