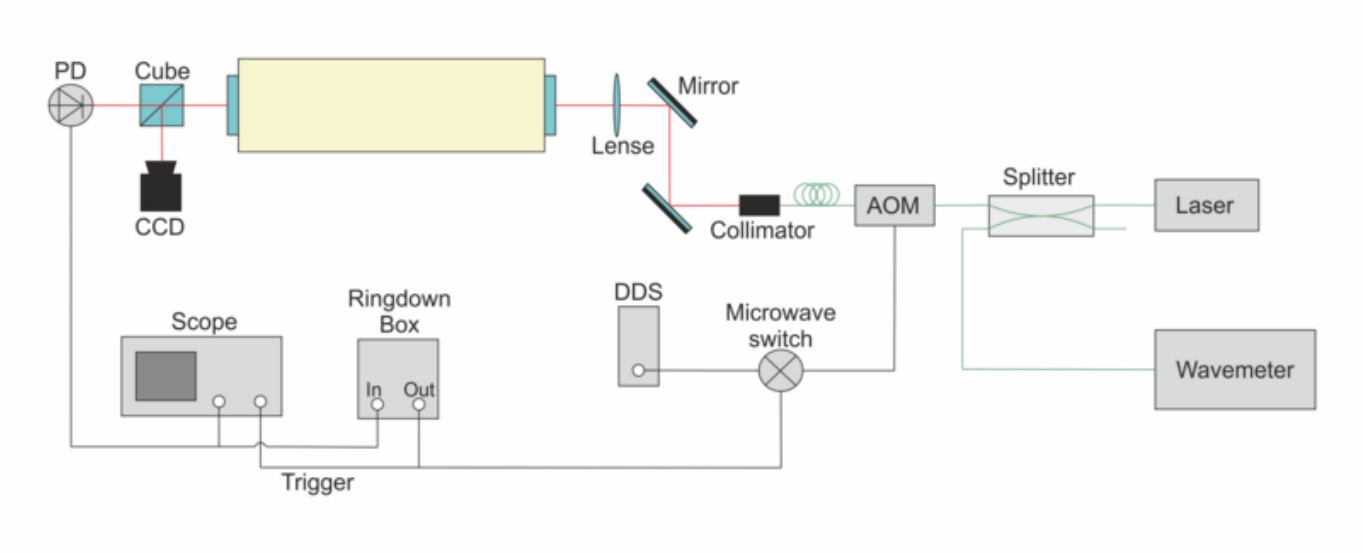
Ring-down Box

Application of the ring-down box

You can measure the finesse of a resonator with the ring-down box **without** locking the resonator!

Advantages

1. super fast (see characterization)
2. without locking the resonator



Measurement Method

Evaluation

Use this formula to analyse the datapoints:
y(x)=A*exp^(-x/t)+y0 with x:=time, t:= delay time

Afterwards calculate the finesse with F=2pi*t*FSR with FSR:=free spectral range.

Electronic setup

Explanation of the operating principle

- Electronic drawing (PDF-file)

Bilder rein mit dem Kurbven etc.

Characterization

List of components

- Inverter: LT1363
  - Invert negativ input voltage to positiv
    - Datasheet_LT1363
  - Power supply: +/-5V
- Comparator: AD8561
  - Compare input voltage and threshold value
    - Datasheet_AD8561
  - Power supply: +/-5V
  - High speed timing: 7ns @ 5V
- Flip-Flop: SN74HC74
  - Output of trigger
    - Datasheet_SN74HC74
  - Power supply: +5V
  - High speed timing: 15ns
- 1x XLR connector
- 1x Power supply +/-5V
- 1x single switch
- 1x double switch
- 3x BNC connctors
- 1x Potentiometer
- 1x big red button
- 2x 8-pin holder
- 1x 14-pin holder
- 3x PSK 3-pin cables
- 5x 100n capacitors
- some resistors (3x 100k, 1x 4.7k, ...)
- 1x Al-box
- 2x PCB´s