CRD-measuring setup

Cavity-Ring-Down-measuring setup for precise measurement of losses at high-reflective coatings

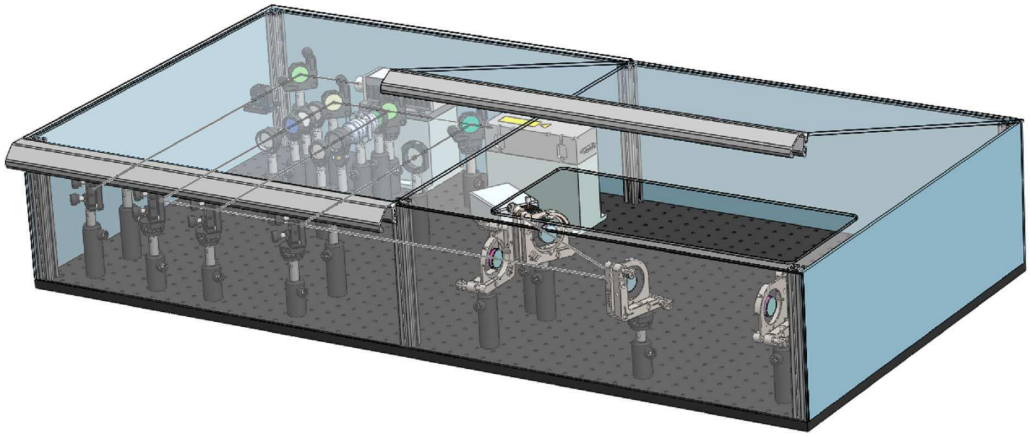

Figure 1: Exemplary conceptual drawing of a four-wavelength measuring setup of the CRD type

Field of application:

- Precise **evaluation of losses** at high-reflective optical coating layers
- Measurement of losses at plane and slightly concave ($|r| > 500$ mm) optical components with nominal reflectivities R » 99%
- At $R > 99.5\%$, to a **precision** of **$dR/R < 2$ ppm**.
- Measurement of losses at **various, discrete angles of incidence**
- Employed **laser wavelength(s) selectable on order by the user**, according to the desired target wavelength of the coatings (e.g. ≥355 nm … 532 nm … 633 nm … 1064 nm … ≤1319 nm)

Measurement principle:

- Coupling of a pulsed or fast switched cw laser into a passive resonator cavity
- The coating under measurement is hit on every round-trip → **reflective losses**
- Highly precise evaluation of the time dependence of the out-coupled signal → **ring-down**
- With known round-trip time for a pulse, the ring-down temporal characteristic evaluates the losses L per reflection; with the assumption that $R = 1 - L$, the reflectivity is obtained.

Technical specifications:

Measurement of reflectivities: Precision:	R » 99% dR/R < 2 ppm for $R > 99.5\%$
Evaluable samples / requirements on the substrate*: *For measurement under 0° a.o.i. Other specifications on request.	Ø 1" or 0.5" (~ 25, 12.5 mm), thickness ~ 6 mm; substrate transparent at employed wavelength; rear side polished, plane
Power supply: laser (may vary according to model): detector:	 100 – 240 V AC, 50 Hz … 60 Hz +/- 9 V DC
Modules for data acquisition, A-to-D-conversion and data procession	
Interface to PC (Windows, not included): USB 2.0	
Software for evaluation (reflectivity analysis) and data base handling of measurement data (e.g. input of production and measurement parameters, sample-no. etc.)	

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