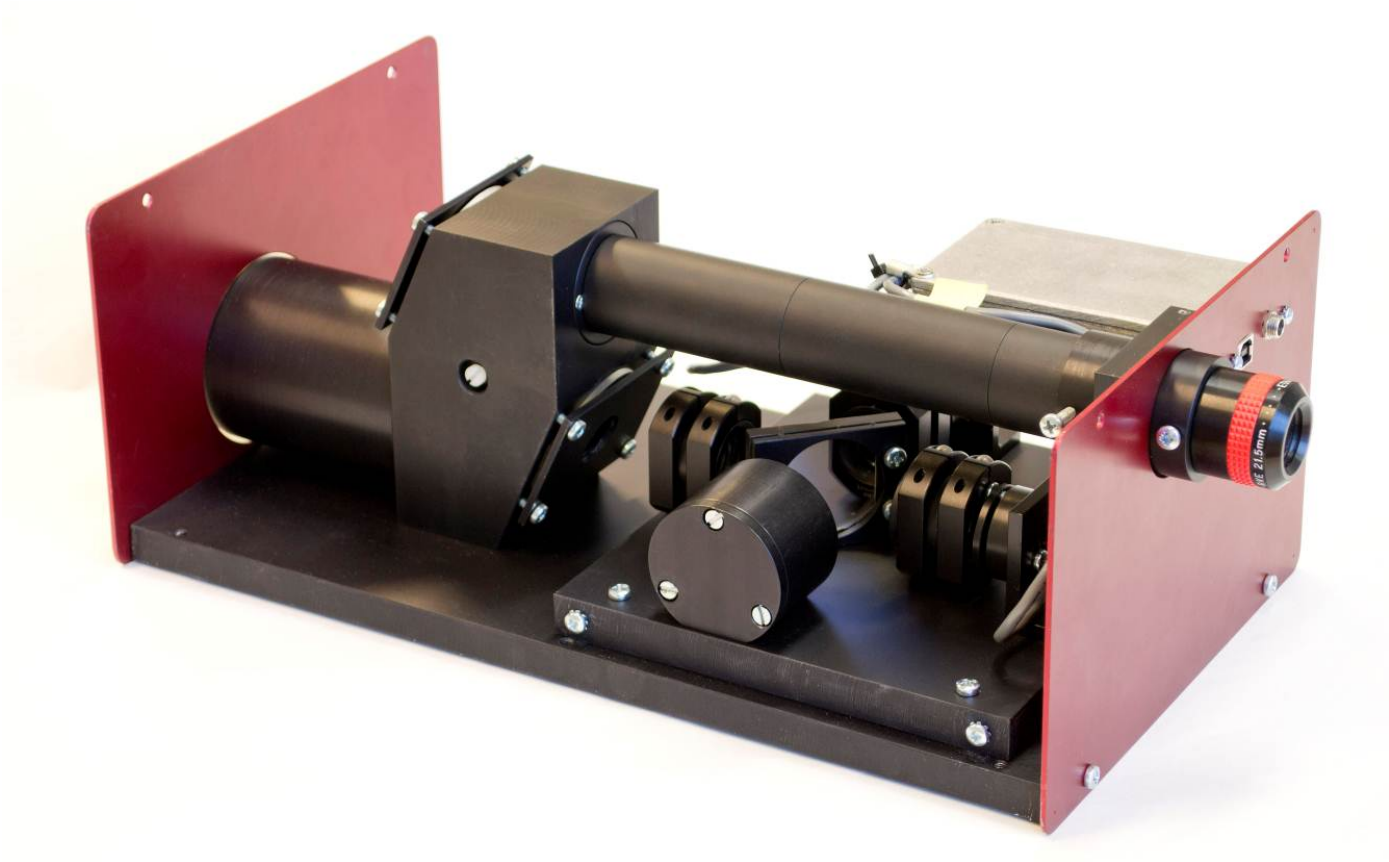
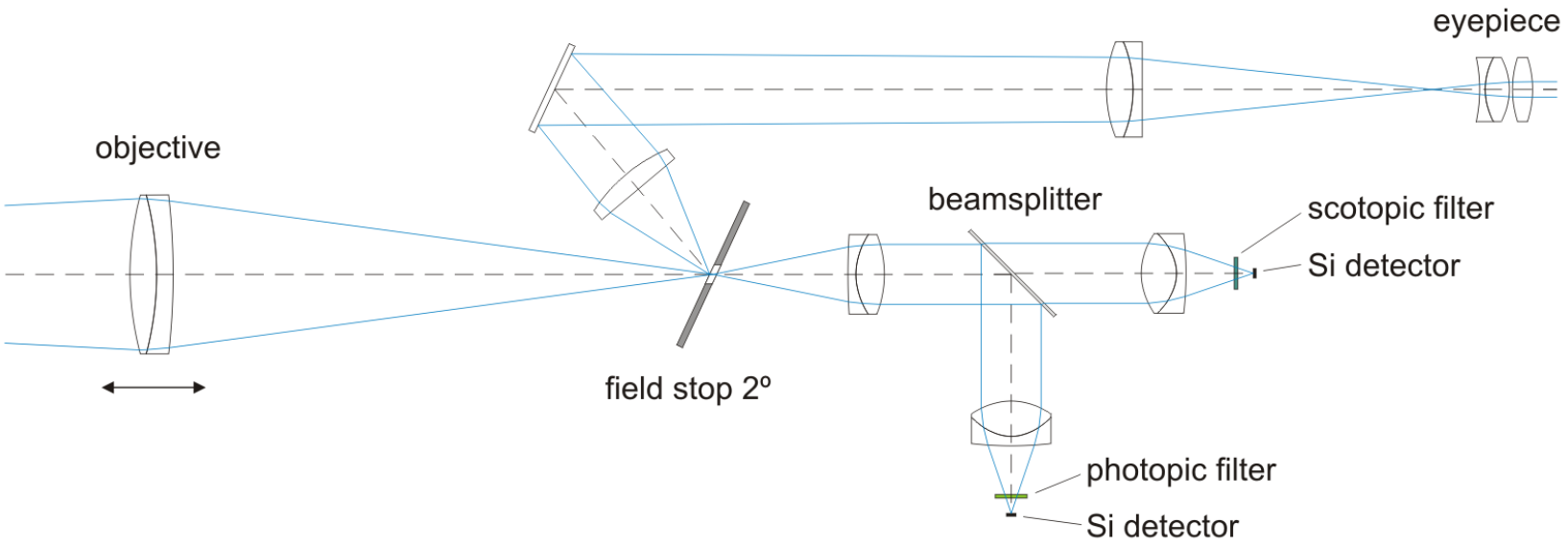
Two-channel photopic/scotopic luminance meter



Aalto University
School of Electrical
Engineering

Optical layout



- Off-the-shelf optical components
- 2 detection channels, weighted by $V(\lambda)$ and $V'(\lambda)$ respectively

Amplifiers: SWIFD (CMI)

- 2-channel switched integrator amplifier with 20 bit ADC
- Controlled by LabVIEW via USB

Test results

- Lowest measured luminance level: 0.005 cd/m^2
- Standard deviation of the mean: 1 % with <2 s of integration
- Estimated f'_1 for photopic: 1.5 %; scotopic: 5 %
- Things to characterize:
  - Spectral sensitivity
  - Linearity
  - Effects of out-of-field sources
  - Environment effects (temperature, humidity)
  - Response to modulated luminance
  - Polarization
  - …