Research Project / Masterthesis: Determining LAI at plot scale

Research objectives:

- The leaf area index (LAI) and the degree of canopy cover are important parameters in forests for the modelling of energy and water balance. There are different methods to determine LAI and each method has it's drawbacks and uncertainties. The aim of this work is to compare different approaches for LAI and the degree of canopy cover determination. What is the best method to get an annual LAI-curve of a small forest area (<1 ha)?

Methods:

- Measurements:
  - Specific Leaf Area (SLA in cm²/g) & tree physiology & litter fall traps …
  - Analysis of hemispherical photographs
    - Fisheye + DSLR –camera + O-Mount & WinSCANOPY
    - Solariscope SOL300
  - UAV-derived LAI data

- Statistical analysis
- Photogrammetric analysis
- Consideration of
  - Vegetation dynamics
  - Sample design
  - Weather conditions
  - Scale
  - Beech vs. scots pine
Phenological observations

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