

BRF of forests

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For the study of forest reflectance a special airborne spectrometer system UAVSpec3 [1] was designed and built at Tartu Observatory. UAVSpec3 is an autonomous spectrometer system which does not need operator's intervention during measurement. Its main components are a spectrometer module which measures VNIR reflectance in the nadir direction and a bidirectional reflectance factor (BRF) sensor which records angular distribution of reflectance in one narrow spectral band on a transect along the flight path.

Angular distribution of hemispherical-directional reflectance of forests at Järvelja test-site in South-East Estonia has been measured in flight campaigns in July-August of 2007-2011. The BRF sensor measures the angular distribution of reflectance at the azimuth angle determined by the flight direction. The red filter (660 nm) was used in 2007, 2008, 2010, and 2011. In 2009 the NIR filter (850 nm) was used. As the share of diffuse incident radiation is small at these wavelengths, the measured reflectance distribution is almost BRF.

The BRF of three stands at Järvelja which are described in the Järvelja data-base [2] has been measured several times and at various azimuths.

References

- [1] J. Kuusk and A. Kuusk, "Autonomous lightweight airborne spectrometers for ground reflectance measurements," in *Proceedings of the 2nd Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing (WHISPERS '10)*, IEEE, June 2010.
- [2] A. Kuusk, J. Kuusk, and M. Lang, "A dataset for the validation of reflectance models," *Remote Sens. Environ.*, vol. 113, pp. 889-892, May 2009.