

## **Can We Trick the Tricky Weather? Reflectance Measurements in Changing Illumination Conditions**

**Joel Kuusk** <sup>(1)</sup>

<sup>(1)</sup> *Tartu Observatory  
Tõravere 61602, Estonia*

*joel@aai.ee*

International measurement campaigns are usually planned weeks or even months ahead. It may be suitable for the Mediterranean region but not for the northern part of the north temperate zone where predicting weather even a few days ahead is complicated. International collaboration, however, is very important and it inevitably takes some time to plan fieldwork abroad. Therefore, when the weather during the expedition is not the best, care must be taken to mitigate the problems as much as possible.

Reflectance is the ratio of reflected and incident radiation. If the target radiance is measured, it is essential to know the amount of incident radiation at the moment of the measurement. Usually this is accomplished by measuring the radiance of a reference panel every now and then. Since the reference panel has calibrated reflectance, it is possible to calculate the incident flux density during reference measurements and interpolate the values in between. This is feasible only in case of clear sky or at least no fast moving clouds near the Sun. In cloudy conditions some other method must be used, e.g. another sensor continuously recording the incident flux density at the site.

In August 2011 reflectance measurements of shrublands were carried out in Denmark. Target measurements were done with the SVC HR-1024 (Spectra Vista Corporation) spectrometer and miniature spectrometer modules MMS-1 and NIR-PGS-2.2 (Carl Zeiss Jena GmbH) were used as reference spectrometers. The weather conditions varied from almost clear sky to overcast. The effect of using reference spectrometers for recording illumination changes is compared to the regular method of interpolating between the reference measurements. Although using simultaneous incident flux density measurements improves the accuracy of the results, it does not completely remove the problems caused by the bad weather. We may try to trick the tricky weather but the outcome is far from perfect.