19.8.2013 18:00

**Discussion notes, “Wish list for a new measurement setup and missing targets”**

**Could one make a better polarized standard?**

 -workshop on the topic was organized in Zurich in January 2013

-can you produce a precise amount of polarization?/target that produces a precise amount of polarization?

 control of light source?

 1% accuracy would be good

-Why is anything but 0 or 100% needed? 0% can be done now

European metrological society has supported polarization projects, in particular ones referring to standards; we have submitted 3 proposals over last years. The latest one did not get funding or decision about funding is not yet made.

**Measuring circular polarization**

Blind to biology, interesting to pharmaceutical companies, circular polarization, in theory can be a valuable component to be measured

 linear polarization is always stronger than circular polarization

the mirror is the main problem in measuring circular polarization, need for modulators

 may provide new information on multiple scattering

 polaroid type material could be used but the spectral quality not good there are better alternatives but far more expensive

 How broad wavelengths are needed defines the usability of the measurement

 chlorophyll content

Feedback from other established scattering experimental group is missing on the workshop (currently located in France, started in Amsterdam in previous years)

 idea with floating dust particles within SAEMPL project, once succeeded in Helsinki results should be accessible through the web to other research groups

 spectro-polarimetric measurements of aerosols

 group working with aerosols would be interested to know more about the polarization of the earth’s surfaces,

 satellite instruments are mostly measuring at nadir, you need more angles to get better use of polarization

The aerosol people need information about the surface and the surface people need information about the aerosols, neither can be measured without knowing the other.

**Commercial applications**

Today headlights of cars can easily and cheaply be made of strongly polarized LEDs

How effective would they be in real life? For example, wet surfaces?

Developers need information on real life surfaces

More money in instrument development, multiangular polarimetry: indoors aerosols.

Can we tell the difference between soot and sand, that being carbon and silica particles, big companies interested in this..

Lunar dust costs 100 000 pounds per gram. Which material is most similar to lunar dust?

Which materials/topics should be measured?

2/3 of the Earth’s surface is covered by surface water, can polarization offer something to this field?

-Water measured in Sweden by Jouni Peltoniemi et al.

 -Lots of measurements of sea water and suspension particles in water

-Less studied: white foam in the surface of the water, similarities to clouds or snow?

Aurorae lights have been measured, have been found to be weakly polarized, but the lighting conditions are dark and signal small/weak

Satellite measurements should be combined with field measurements that help in classifying the Earth’s surface

 maybe use Jouni’s laboratory measurements,

 measurements in different levels/heights, surface, UAV, aircraft, satellite

Are there some reasons or application for observation with an instrument that works in UV? Characterization of particle size in different wavelength including short wavelengths, may provide additional insights, e.g. help to characterize aerosols

Medical applications are questionable since they must be organized not to be harmful

Polarimetric measurements in different wavelengths; change of polarization: 1 degree angles, polarization peak angle..