Key Conclusions from the EUFAR Expert Workshop on Atmospheric Radiation Measurements.

Instrument Intercomparison:

Many groups are developing new instrumentation, often of high spectral resolution, and an intercomparison of these instruments and their calibration should be conducted.

The first stage of the process should be a ground based calibration/intercomparison exercise consisting of a laboratory phase followed by a field measurement phase. The following range of instruments should be compared - SW irradiance and radiance measurements, LW radiance measurements. A data base of instruments and importantly available calibration targets will be compiled first.

A later stage will be airborne intercomparison of the instruments - this is a longer term aim but should also encompass the wide range of supporting measurements requried for radiative transfer studies e.g. temperature, water vapour, pressure, ozone etc.

Future Instrumentation:

A range of new instruments are being developed or considered for the EUFAR fleet. Several platforms are developing new high spectral resolution short wave irradiance measurements. Other are considering low frequency microwave radiometry for soil moisture content measurement and small compact lidars for cloud top height retrieval. Other future instrumentation is primarily in the support of the space sector and includes high resolution far infrared interferometers. The following bullet points highlight the main issues that were brought out:

- Need to combine high spectral resolution measurements in the shortwave and longwave and require nadir and zenith view capability.
- Greater collaboration between the active and passive instrument sectors is required.
- Effort needs to be put in to having enough staff to look at the data.
- Need excellent supporting thermodynamic measurements.
- Addition of ozone to dropsondes would be desirable
- Measurement of trace gases should be encouraged e.g. CH4, CO2, O3 and CO.
- The use of common data formats across platforms would be useful for join operations but also in moving instrumentation and software from one platform to another.