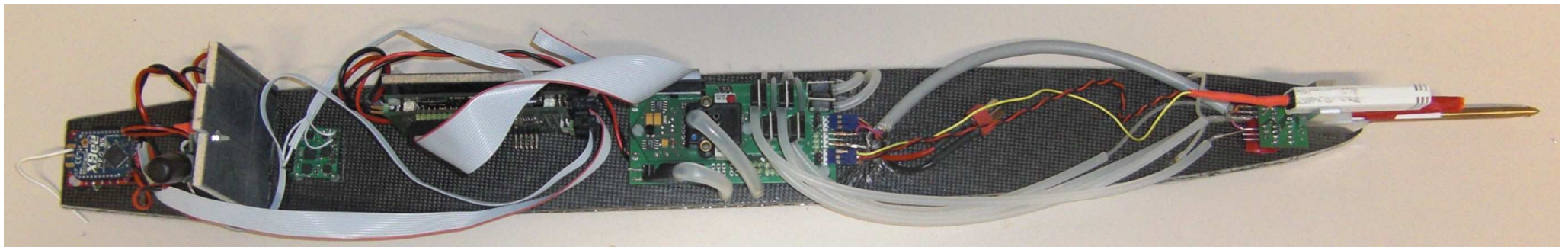

Workgroup 2 on RPA Measurement Technology – Goals and Achievements

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COST ES0802 Workshop, Mallorca, 21. Feb., 2013



General goals of the COST action with respect to WG 2 acc. to MoU (June, 2008) – #1

- 'coordination of ongoing and the conception of future research on the development and application of UAS'
 - + **Reached:** two meetings per year, lots of co-operation established, e.g. measurement computer, auto pilots, sensors, flight strategies
- 'high-resolution in-situ data that do not rely on similarity or propagation assumptions'
 - + **Reached:** definition of quantities to measure and accuracies during Braunschweig meeting in spring, 2009
- 'overview and creation of a database of existing ... suitable sensors and onboard logging systems to avoid unnecessary multiple inquiry and development'
 - + **Reached:** see following

General goals of the COST action with respect to WG 2 acc. to MoU (June, 2008) – #2

- 'Development of reliable **routines for sensor calibration** (in-flight and laboratory)'
 - + **Reached** see individual publications
- definition of standards for methods and algorithms used for UAS measurements, **data analysis and error investigation** to ensure high data quality and intercomparability.'
 - + **Reached:** although no joined data analysis software for UAV missions (due to different requirements and approaches), but a small number of individual solutions at the various institutions, open to other researchers

Deliverables of WG 2 acc. to MoU (June, 2008)

1. **Database** with the meteorological sensors applicable to UAS, their advantages and limitations:
 - (a) For **standard measurements** (pressure, temperature, humidity, ways to retrieve wind components) – **Done!**
 - (b) For **turbulence measurements** (momentum, sensible and latent heat fluxes for which high resolution 3-D velocity, temperature and humidity measurements are crucial) – **Done!**
 - (c) For **non-standard measurements** (e.g. microphysical measurements in clouds, aerosols, radiometric measurements, atmospheric trace gases) – **not completed**, many new methods, rapid development, research ongoing
2. **Recommendations for selection of the sensors** for the particular type of measurements and the UAS aircraft – **Done!** (see data base and 'sensor-decision helper')
3. Assessment on techniques for retrieval of **3-D turbulent wind vector** – **Done!**, see publications, at least two strategies: a/c drift due to wind; flow probe + GPS + IMU

Final report and summing-up publication

Agreement in Sheffield, 2012:

'Invited speakers will be asked to prepare extended abstracts' (– however, conference committee decided not to invite); these are:

- **Measurement computer:** Burkhard Wrenger
- **Position and orientation:** N.N. / Heinrich Warmers
- **Wind:** Jens Bange (Bruno Neininger)
- **Thermodynamic scalars:** temperature, humidity, pressure: Norman Wildmann (Bruno Neininger, Phil Anderson for temperature)
- **Aerosols, clouds, radiation:** Gregory Roberts and Keri Nicoll
- **coordinator needed?**

Discussion!