















Department of Electrical & Computer Engineering

Airborne Sampling/Sensing of Distal Volcanic Ash

Project Group Meeting #7

Minutes

**Minutes of the meeting PGM #7 13th May 2016, VH 457**

**Present:**

Maan Alkaisi, Jamie Van de Laar, Ryan Taylor, Jake Campbell, Michael Shanaher, Parth Thakur, Adrian Weller (Skype)

**1. Apologies:**

NIL

**2. Minutes from Meeting #6**

Confirmed as a true and accurate record.

**3. Matters arising**

Confirmation of BOM for DTA:

* Adrian said 10 days for OPC-N2 to be shipped from Alphasense, should be here in 2-3 weeks. Adrian will confirm order this Monday - to be shipped to Maan's office
* Talked about usefulness of Alphasense SO2 sensors- group agreed we didn't want at this stage as there is no guarantee SO2 will still be present in the atmosphere.

Craig introduced to project, a good contact if we have questions relating to the UAV itself. Craig stressed importance of modelling to choose battery capacity - need to think about optimization of size of battery vs mass vs range vs sensor space. Also antenna placement important so that different radio signals do not interfere.

Adrian highlighted the need for contacting the CAA regarding rules that apply to the project

* Don’t want the UAV dropping out of the sky
* Do we need kill switch redundancy?
* Do we need a parachute etc?

**4. Correspondence**

NIL

**5. Progress Reports:**

* **Ryan**

What size sample would a lab typically want?

* Fraction of a mg but the more the better obviously - should do some calculations to estimate time required in air and ash collected assuming 1-2mg/m^3
* Could possibly collect samples on surface of UAV although fine filter would be better
* **Jamie**

Sensor test chamber was discussed:

* + All agreed a bit bigger could be better
  + Using nitrogen gas to agitate is problematic due to pressurizing chamber and portability of nitrogen bottles.
  + Probably use small low speed cheap fan housed inside for portability/sealing – closed loop, not pressurizing.
  + The low ash levels should be able to be measured using nano lab scales
* **Parth**

Talked about electrostatic sensors:

* + Probably need to look at research to optimize placement of probe
  + Identified need to measure out and test under expected ash mass loading conditions
  + Measure inherent electrostatic properties of ash or create a triboelectric effect?
* **Jake**

Webcam particle sensor:

* Performance not near level of sensors such as OPC-N2
* Hence decided to move on and look at modelling instead

6. **Other business:**

Other ash/dust sensors were discussed

Maan said that "Sam" from NIWA in Christchurch had used the cheap PMS1003 OPC sensor, we should contact him to see where they source them from/if we can buy from them.

Initial/short term goal for project is to have UAV flying around and able to transmit data on level of particulates in air to a ground station.

**Meeting #2 ACTION LIST**

|  |  |  |
| --- | --- | --- |
| **ACTION** | **ASSIGNED TO** | **DUE DATE** |
| Contact CAA | Parth | Asap |
| Contact Sam at NIWA about cheap particle sensor | Mike | Asap |

**Next meeting date: 19th May 2016**