Department of Electrical & Computer Engineering

Airborne Sampling/Sensing of Distal Volcanic Ash

Project Group Meeting #9

Agenda

Date: Friday May 27th 2016
Time: 3pm
Venue: VH 457
Chair: Mike Shanaher
Secretary: Parth Thakur

1. Apologies

   NIL

2. Minutes

   (Attached)

3. Matters arising

- OPC-N2 Alphasense
- Cost of sending wind tunnel

4. Correspondence

- Waiting to hear back from Daniel Blake regarding Geology Dept. ash rig and SAG
- Waiting on CAA response on UAV fail-safe mechanism

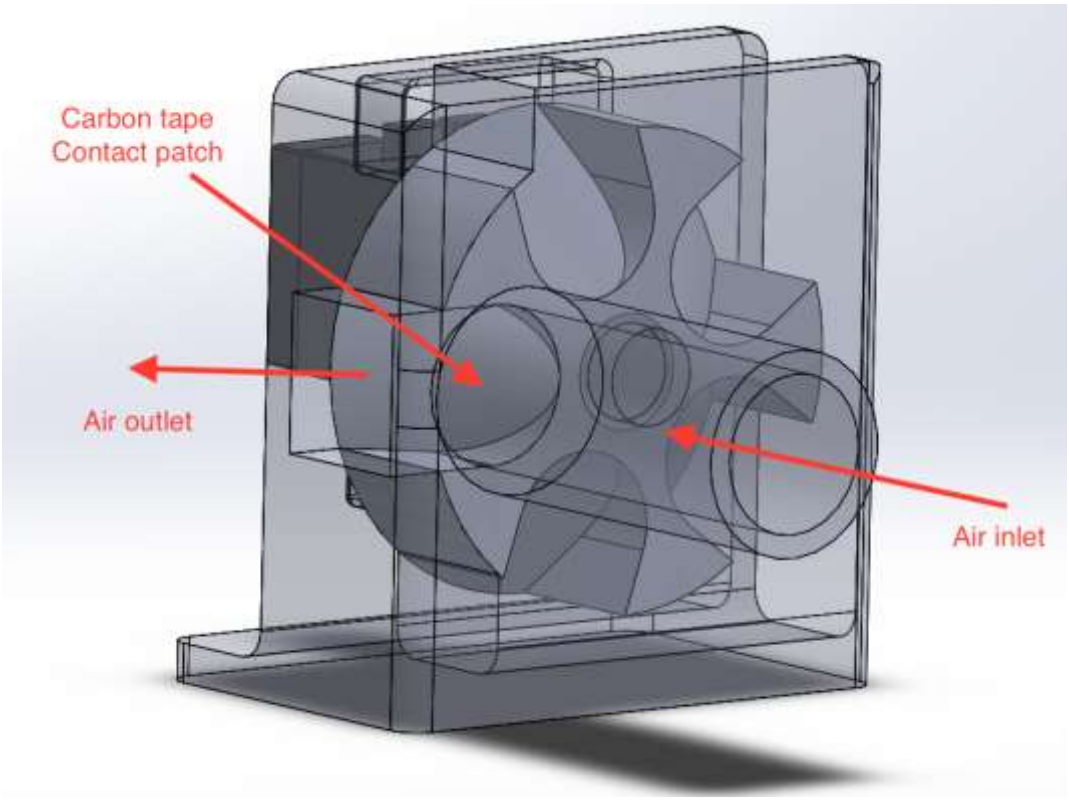
5. Progress Reports:

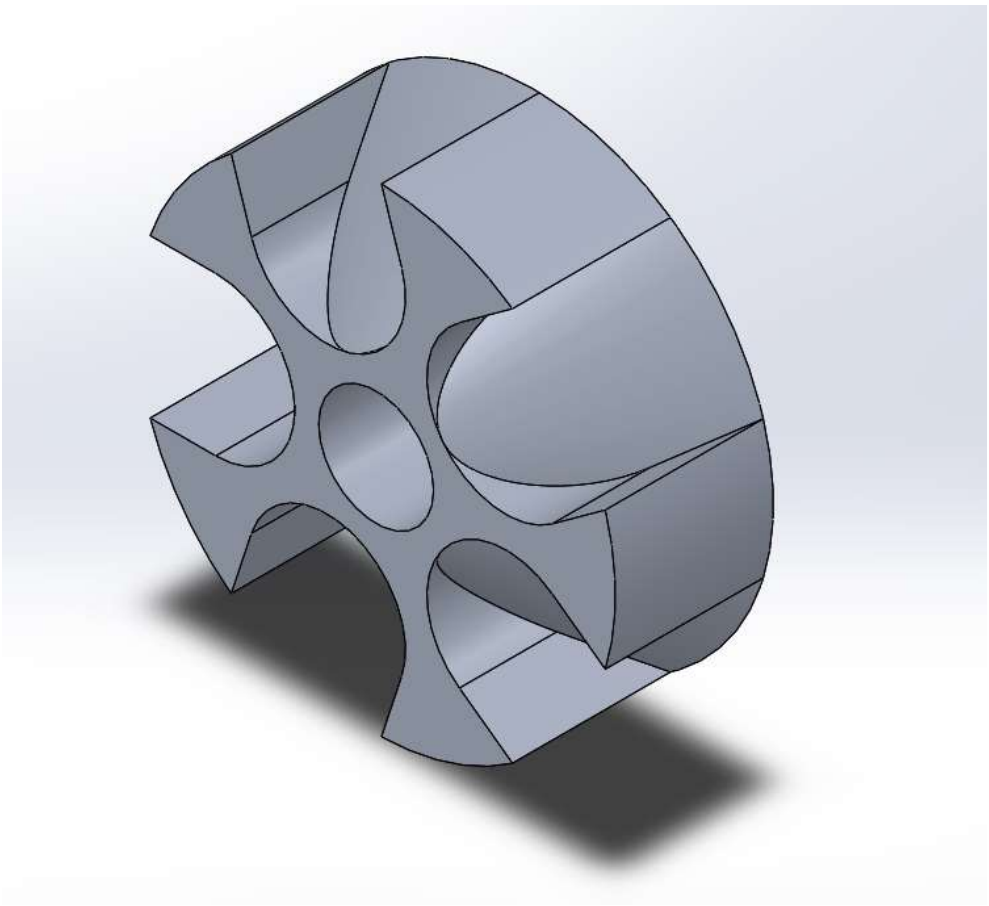
- Ryan – Ash capture
- Mike – Pixhawk && Telemetry
- Jamie – Test Chamber
- Jake – Modelling
- Parth – Electrostatic sensor

6. Other business:

- Next meeting
- Progress over exams period and Holidays

7. Ash Capture Concept:





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Project Group Meeting #8

Minutes

Minutes of the meeting PGM #8 20th May 2016, VH 457

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

1. Apologies:
Jake Campbell

2. Minutes from Meeting #7
Confirmed as a true and accurate record.

3. Matters arising
Contacted Sam from NIWA regarding the source for the cheaper particle sensors that they have used.

Order for OPC-N2 and USB adapter placed.

4. Correspondence
All group members CC'd in relevant email correspondence throughout the week.

No other forms of relevant correspondence.

5. Progress Reports:

- **Ryan**

Update on sampling system design

- To use carbon tape to collect sample placed at some angle to the air flow through an internal tube in the nose. Air deflected out side or bottom/top of air frame.

- Angle of deflection and operation at -70 degC important consideration

- **Jamie**

Static ash test chamber discussed. Agreed that acrylic would be less than ideal due to cost and electrostatic properties. A glass fish tank could be cheaper, however, MDF could prove to be the cheapest material that would enable easy rework. We identified the need for a coating that would enable easy cleaning.

- **Parth**

Talked about electrostatic sensors:

a. Confirmed that DIY approach is only viable option due to power requirements of off-the-shelf designs
b. Identified possibility of using conductive paint as electrodes on wings
c. DTA could provide advice on analog electronics and sensor design

- **Jake**
  - No progress to report as Jake was away.

- **Mike**

Progress on telemetry/air frame

a. Meeting with Kelvin Barnsdale
b. Have use of RC transmitter & receiver
c. Have use of telemetry set
d. 433MHz antennas ordered
e. Confirmed airspeed sensor to be ordered by DTA. DTA identified difficulty in making small orders. Mike suggested that the airspeed sensor order be delayed until he determines which long range telemetry equipment to order. DTA suggested that we do not wait that long and decided to go head and order the digital airspeed sensor.

6. **Other business:**

Adrian raised discussion on use of the DTA wind tunnel. Likely to be expensive to ship but perhaps DTA can send only the fan and fan controller section. In any case, if we were to build our own here at UC then their design could be copied.

Adrian suggested that the cheaper sensors could be used as the final solution if proven suitable. The OPC-N2 could be used as the gold standard/benchmark for testing and calibrating them.

Daniel Ashman introduced to the group as another source of information/advice that can be contacted directly for specific needs as required.

Meeting #8 ACTION LIST

ACTION	ASSIGNED TO	DUE DATE
Contact Chris Hann (wind tunnel supervisor at UC)	Jamie	Asap
Investigate cost of sending wind tunnel	Adrian	Asap
Investigate purchase of carbon tape	Ryan	When needed
Power up and initial configuration of air frame	Mike	Next week
Contact Dr Thomas Wilson RE: ash testing rig/ash advice	Adrian	Asap
Order Airspeed sensor	Adrian	Not urgent

Next meeting date: Friday 27th May 2016