**MPhys interview slides:**

**Title:**

I’m Alain and this is our presentation for our project on the seasonal variation of dust activity in the middle east….

**Intro:**

Aiman

**BCP:**

So the backbone of our project was the Backscatter cloud probe, or BCP. It is a linearly polarised laser with a wavelength in the visible spectrum at 658 nm.

It is pointed outwards from the fuselage of the aircraft at a slight backwards angle.

The BCP collects data at a resolution of 4s

Particles incident on the laser result in refraction and backscattering, the latter of which is what we are interested in.

This backscatter results in the laser light propagating back towards the BCP, which upon being collected by a set of lenses, is incident on an Avalanche photodetector. The incident photons are converted into a voltage which determines the size of the bins for the particle.

The BCP actually makes an approximation using Mie theory, which assumes perfectly spherical particles in order to estimate the particle diameters

**Results: freq graphs**

Aiman

**Results: Vertical profiles**

So the way I coded this was using python to average the particle concentration number in altitude intervals of 100m.

As you can see, in altitudes below 500 m the particle number concentration dips to zero

This is likely because our flight profiles are approaching their landing or are about to takeoff, at which the BCP instrument is turned off and not collecting any data for safety purposes as the laser is actually not eye safe and could flash into a passenger or airport staff’s eyes

From the graph it can be seen that the cities of Doha, Jeddah and Bahrain roughly have on average the highest average particle concentration

On the other hand, the lowest particle concentrations were observed in the cities of Dammam, Dubai and Kuwait city.

We actually split the graph at 6000 m as above these altitudes the particles are more likely to be cirrus clouds, which we are not the subject of interest

**Results: Doha**

**Aiman**

**Results: 9th feb**

This was made using NOAA’s hysplit modelling software, which shows the particle distribution of mass a number of hours from the origin

It was done using 6 hour intervals for a total of 24 hours

Due to south easterly winds, likely originating from one of the largest Saudi arabian desert

Due to the proximity to the Persian gulf, large proportions of the minerals were actually due to sea spray such as halites and there is a higher proportion of quartz come from the desert itself than normal days

**Results: summer**

Due to the northwesterly al-shamaal winds which are actually the predominant transportation mechanism in the summer for the arabian peninsula

Similarly there was a higher proportion of halites and quartz than a normal day, but with actually lower proportions of halites than the winter dust storm

**Limitations I:**

Due to ongoing military intervention against IS in Iraq and Syria, airspace over Iraq, which is half of the predominant sources of wind from in the Persian gulf

Fewer flight profiles – affects both the frequency of dust events graph and skews the vertical profiles graph due to lack of data in the winter months