

## **B499 20 January 2010 CONSTRAIN Flight 4**

### **Sortie S8: Ice nucleation in super-cooled Stratocumulus**

Super-cooled Stratocumulus with cloud tops reaching  $-10^{\circ}\text{C}$  makes an ideal case study for heterogeneous ice nucleation.

#### **Weather**

#### **Sortie location**

North sea, just off northeast coast between Aberdeen and Newcastle.

Operate between fixed ground points

**A:**  $56^{\circ}\text{N } 1^{\circ}40\text{W}$

**B:**  $56^{\circ}50\text{N}, 2^{\circ}\text{W}$

**C:**  $56^{\circ}\text{N}, 0^{\circ}10\text{E}$

**D:**  $55^{\circ}20\text{N}, 1^{\circ}20\text{W}$

#### **Sortie summary**

Observe Stratocumulus by a series of straight and level runs along fixed ground points.

#### **Sortie detail**

- 1) **Transit** to operating area at best-range speed and altitude, arriving at point **A**.
- 2) **Profile descent:** along **B** to **A**, from 10kft through cloud layer to 50ft, to estimate cloud top and base.
- 3) **Profile ascent:** along **A** to **D**, from 50ft to 2000ft above cloud top.
- 4) **Lidar run:** Perform straight and level 2000ft above cloud top.
- 5) **Cloud penetration runs:** Perform straight and level runs, just above cloud top, just below cloud base and in-cloud. Check for icing of turbulence probe during in-cloud run.
- 6) **Precipitation run:** Perform straight and level run 500ft below cloud base.
- 7) **Saw-tooth run:** between 1000ft above cloud top and 500ft below cloud base.
- 8) If region of high precipitation observed during in-cloud run, break-off and do extra runs in cloud.
- 9) **Return transit** at best range speed.

#### **Instrument requirements**

**Lidar** operated to identify cloud base. No varying integration time or changing the display.