### Cloud Properties and Precipitation Formation Processes Observed During Spring 2009 Field Project

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### **Research Objective**

- Characterize the type of spring time precipitation that develops in the Riyadh, Saudi Arabia region.
- What are the cloud properties for developing cloud in the Riyadh, Saudi Arabia region.





### King Air 200 Saudi Arabia Spring 2009









### Airborne Data Set

**Quality Control** - The process of conducting tests to check that measurements are being made correctly and accurately.



#### **Quality Assurance -**

The process of reviewing a data set to eliminate measurements that are invalid due to known problems.



#### **FSSP Performance Checks**



Average channel values from valid performance checks conducted on the FSSP during spring 2009 IOP using 30  $\mu$ m beads. The solid horizontal line indicates the "standard" average channel value. The laer beam size and depth of field is based on calibration conducted by Kelly bosch and Dennis Afseth at Weather Modification Inc. (WMI) on 22 December 2008.

### **FSSP Liquid Water Content**



### **Droplet Effective Radius**



Sampling of cloud cell between cloud base and cloud top during time interval 49,100 to 50,800 sfm on 2 April 2008. Left panel shows all observations, while the right panel only includes FSSP concentrations at STP that are greater than 100 #/cm<sup>3</sup>. The blue line gives the approximate rate of increase of effective droplet radius with height.



Summary of cloud droplet effective radius measurements in the core (liquid water content >  $0.25 \text{ g/m}^3$ , cloud droplet number concentration >  $300 \text{ #/cm}^3$ , 2DC concentration <  $0.1 \text{ #/cm}^3$ ) of cloud during the spring 2009 field project in Saudi Arabia.



- There exists super-cooled liquid water in clouds in the Riyadh region during spring time convection.
- Observations show a natural ice precipitation formation process and a limited warm rain precipitation formation process.

### **Thanks for Listening**

# Any Questions