Introduction

* Good DSD in-situ measurements are essential
  + Provide insight into many precipitation processes/process interactions
  + Simulated distributions are core of many (binned) cloud (or what scale?) models
  + Cloud indirect albedo affects 🡨look this up

Motivation

----If we’re focusing on wide range of probes----

* Forward scattering and linear array probes are used extensively but have drawbacks
  + Response is often highly theoretical
    - Major uncertainty due to…
      * Sample area uncertainty
      * Inhomogeneous response
  + Performance analysis from in-situ data is complex and often limited to specific conditions
* Calibration methods are lacking
  + Use glass beads or polylatex spheres
    - Have different optical properties
    - Subject to clumping/misshapenness
  + Large spacial/concentration/velocity/diameter uncertainty – good enough for field/diagnostic work but can’t get at specific questions
* Maybe add probe images,

Project

* Develop laboratory optical probe calibration device which uses water drops vs. glass/poly
  + Because….
    - Better representation of instrument response (no refraction complications)
    - High precision allows for detailed laboratory probe studies
  + How?
    - Pezio-electric print head ejects into flow
    - Flow accelerates drop out of tube, through sample volume
      * Secondary ability to decrease drop size w/ evaporation
    - Computerized stages allow precise placement/autonomous runs
    - Metrology camera verifies drop size/velocity