**BOS #3: Identifying the unique benefits of mmPAR observations for Boundary Layer, Fire, Mesoscale Meteorology Studies, and other potential applications.**

Moderators: David Bodine and Scott Salesky

Place: Plains classroom

This breakout session is dedicated to uncovering the advantages of millimeter-wave imaging phased radars for a wide array of applications, including boundary layer studies, fire weather, mesoscale meteorology, and other potential areas. Specifically, we seek to identify what are the key science gaps that mmPARs can address, with the following combined capabilities:

1. Improved temporal sampling (20 – 30 s)
2. 3D coverage and continuous vertical sampling
3. High spatial resolution (tens of meters)
4. Excellent sensitivity (<-30 dBZ at 5 km range)
5. Dual-polarization

**Brainstorming Period and Voting (15 min):**

At the outset of the break-out, we will set up a Google Jamboard to foster brainstorming of potential applications of a mm-Wavelength PAR. After the brainstorming period, we will vote on the proposed topics to identify the top 5 for further discussion.

**Topic Discussion (75 min):**

We will spend about 15 min discussing each of the top 5 responses from the brainstorming session. During this discussion, workshop attendees are asked to consider the following questions:

1. Within this topic area, what are the primary science questions? Why can they not be addressed with existing technology?
2. What aspects of a mmWave PAR would be most beneficial for this topic? High-temporal resolution, vertical sampling (native RHIs), high spatial resolution, etc.?
3. What are the downsides to using a mmWave PAR for this topic and how could potential risks be mitigated?

**Summarize discussion (30 min)**

To prepare for report out sessions and synthesize notes for a workshop report, we will use the final 30 min to conduct a high-level discussion of the scientific value of mmPARs. As time permits, attendees should discuss how mmPARs would be integrated into field campaigns and used synergistically with other instrumentation.