BOS #2: Improving Understanding of Cloud and Precipitation Processes using mmPARs

Moderators: Pierre Kirstetter and Pavlos Kollias
Place: Redbug Cafe

Clouds and precipitation are critical components of Earth's climate system, yet their behavior and processes remain challenging to fully understand and predict. The integration of mmPARs has revolutionized our ability to study these phenomena with unprecedented detail and accuracy. Adding radar features as fast scanning and volumetric imaging capabilities mmWave radars can have unprecedented radar data can help scientist better understand cloud and precipitation processes.

During this session, participants will explore the unique capabilities of mmPARs in capturing high-resolution data on cloud and precipitation processes. Experts in the field will present recent findings and case studies showcasing the impact of mmPARs on advancing our understanding of these complex atmospheric dynamics. Topics covered will include the characterization of cloud microphysics, the dynamics of precipitation formation, and the influence of aerosols on cloud properties.

Through interactive discussions and case-study presentations, attendees will gain insights into how mmPARs are transforming our understanding of cloud and precipitation processes. The session will also highlight the challenges and future directions in leveraging mmPARs for improved weather and climate predictions. Participants will have the opportunity to engage with leading researchers and practitioners in the field, fostering collaboration and knowledge exchange.

Discussion on suggested topics and questions (55 min)

What are the key mmWave technology gaps where better cloud and precipitation are needed,

1. How have mmWave PARs can improve our ability to study cloud microphysics compared to traditional radar systems?
2. What is the most desirable radar technology and capabilities you may need for cloud and precipitation processs.
3. What are some specific challenges using conventional mmWave dish radars to study precipitation formation, and how are researchers addressing these challenges?
4. Can you provide examples of how mmWave technology have been used to study the influence of aerosols on cloud properties and how a mmWave PAR can provide better analysis?
5. What technological advancements in mmWave radars design have contributed most to improving our understanding of cloud and precipitation processes?
6. In what ways do you envision the future development of mmWave PAR technology enhancing our ability to understand cloud evolution and better understand of weather and climate patterns?

Summarize discussion on Jamboard (30 min)
Use Jamboard for summaries key answers and followed priority items selection.