

2023 GLM Science Meeting



Update on the Development and Performance of the Mid-Atlantic Lightning Mapping Array (MALMA)

Guangyang Fang, Damian Figueroa, Ashmita Pyne

University of Maryland/ESSIC/CISESS

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Outline

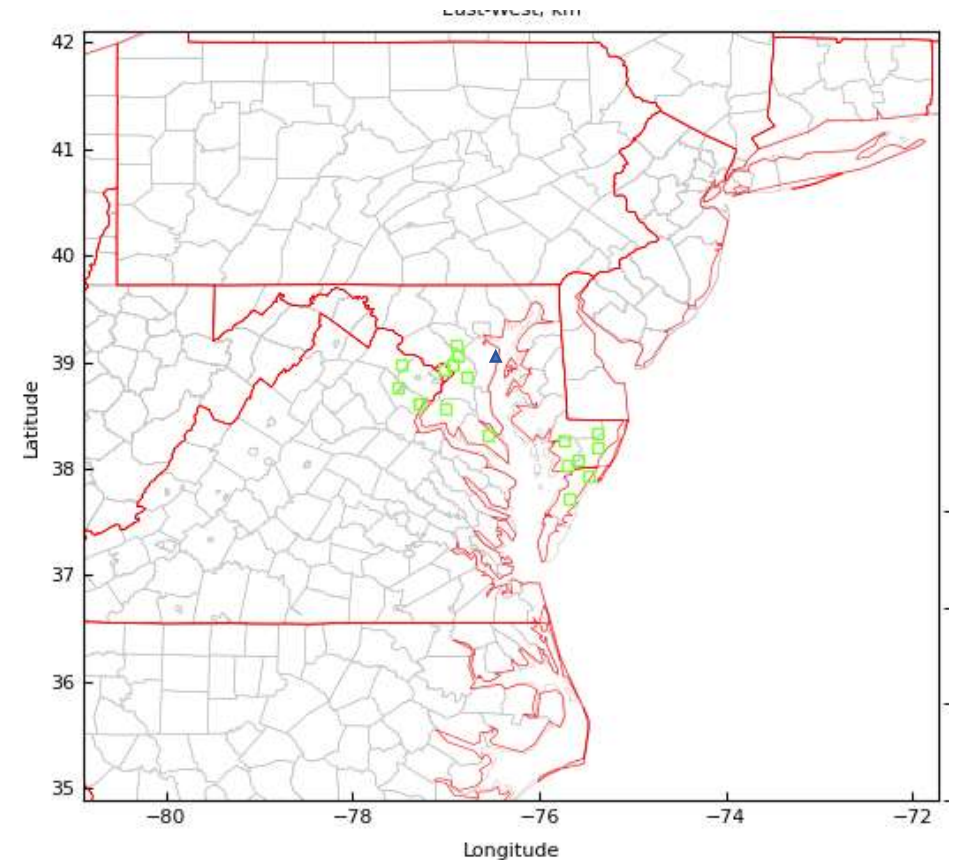
- Update of MALMA
- Storm Chasing in Summer 2023
- VR Visualization



MALMA

Update of MALMA

- Most sites are functioning well;
- A solar LMA structure was ordered, and it will be deployed at **Anne Arundel Community College** (indicated by the blue triangle in the map) according to previous discussion to combine DCLMA and WFFLMA into MALMA more seamlessly;
- Site at **Howard University** in D.C. is scheduled for relocation to the physics building. The plan to mount antenna was approved by the Executive Director of the Physical Facilities Management;
- The DCLMA and WFFLMA data archived from 2018 to the present will be transferred to the GLM server at ESSIC. Subsequently, we will process the **MALMA full solutions**.



Storm Chasing Using Portable Raspberry Pi Camera & Drone



Portable Raspberry Pi Camera in a car



DJI Mavic Mini 3

Storm Chasing Using Portable Raspberry Pi Camera & Drone

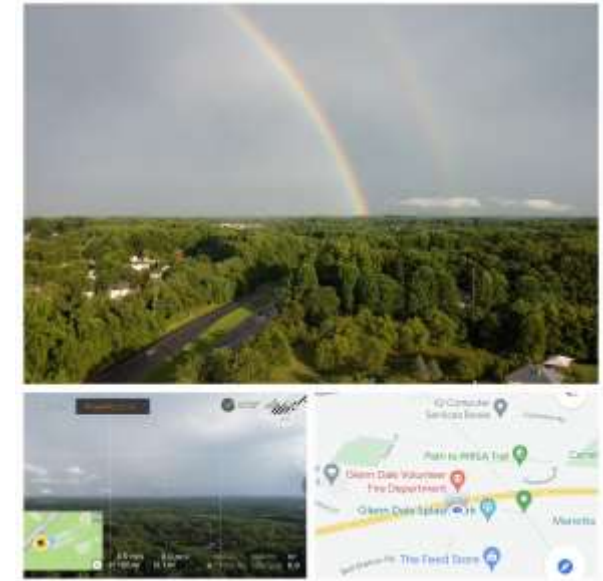


Case 1

Case 2



Case 3



Case 4 Drone Accident

Drone Restricted Zone in Red

VR Visualization-El Nino/La Nina

- Long-term monthly climate data from NOAA



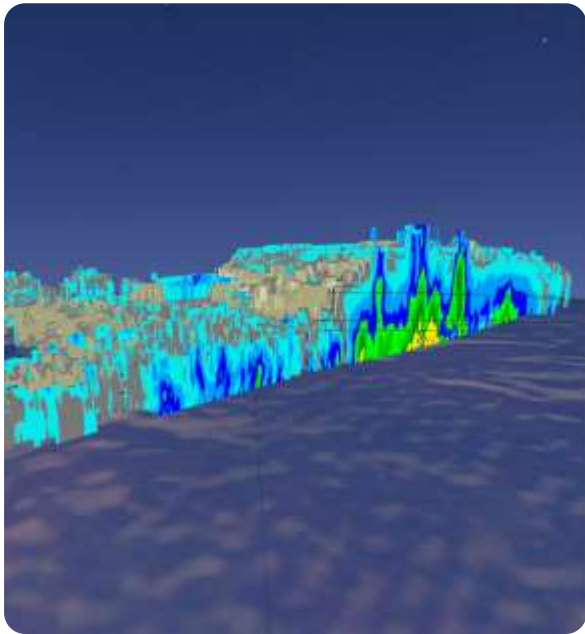
Terrality



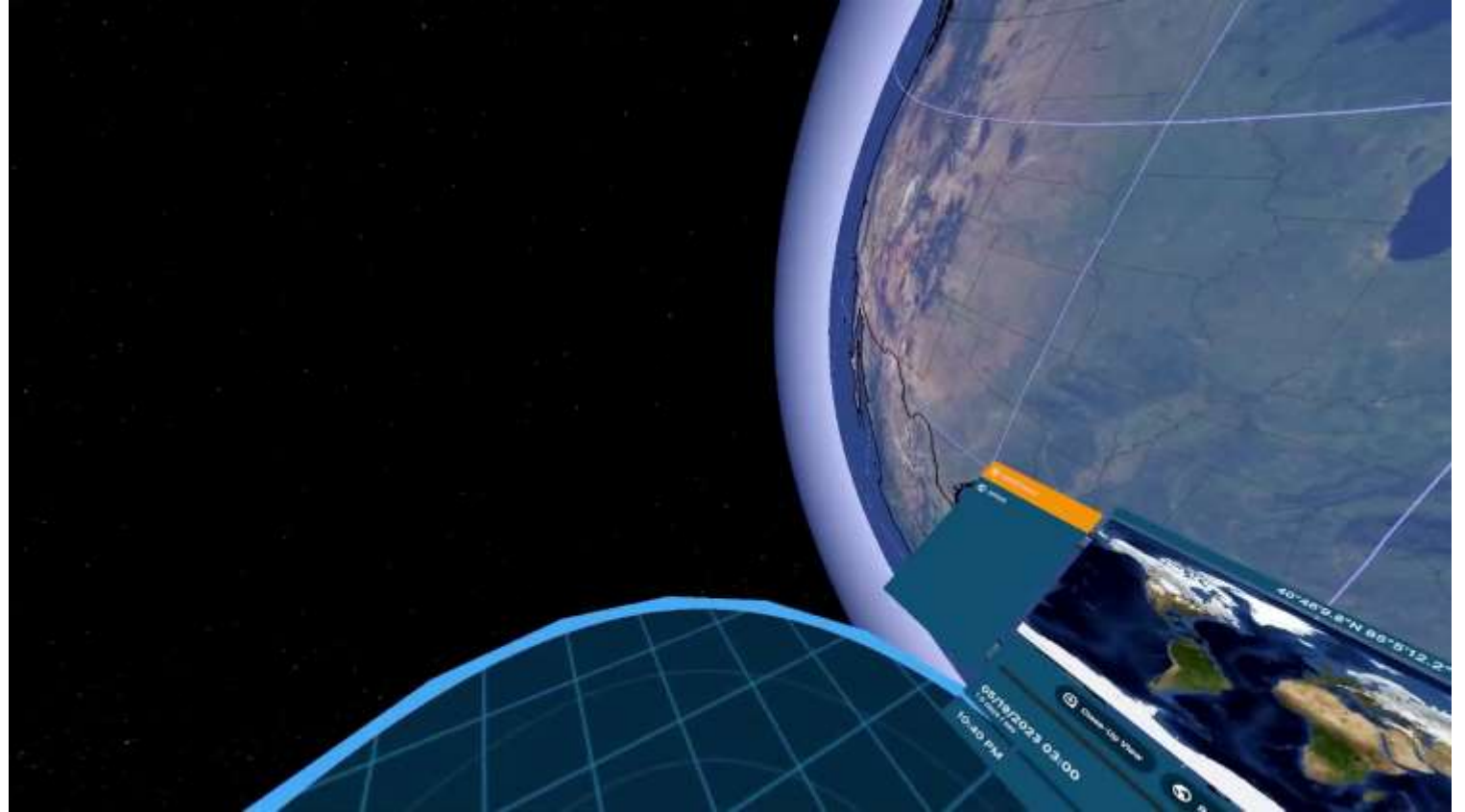
This study was supported by NOAA grant NA19NES4320002 (Cooperative Institute for Satellite Earth System Studies -CISESS) at the University of Maryland/ESSIC.

VR Visualization-Supercell Using Multi-Radar/Multi-Sensor System (MRMS)

- 3D Merged Reflectivity
- Files in GRIB2 format
- Resolution is 0.01° by 0.01°
- 33 altitude layers



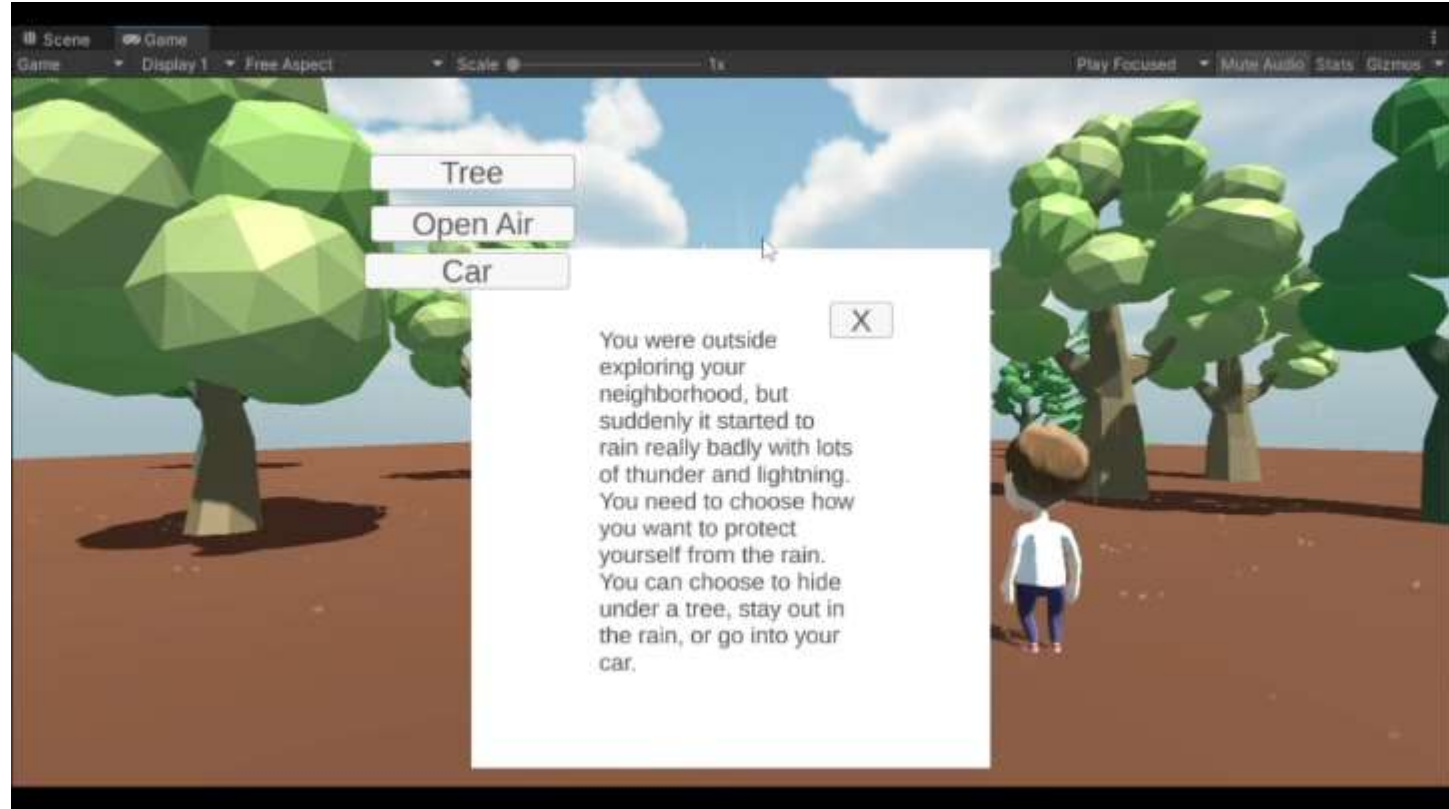
Vertical cross section



Video demo for a supercell thunderstorm in Texas on 5/19/2023 03:00 UTC

VR Visualization-Faraday Cage and Its Application in Lightning Safety

- Faraday cage is an enclosure that allows the electric charge to be redistributed on the exterior surface to shield the interior from electromagnetic fields;
- Using the immersive nature of VR, we wanted to enhance public awareness and understanding of electrical safety which empowers people to make informed decisions in the face of lightning risks;
- This is an educational module mainly for outreach purposes.



Video demo for an educational VR module

Future Work: VR Visualization of LMA and GLM data

- GLM data: Despite in 2D, they can be visualized in a 3D application;
- LMA data: LMA viewer can show 2D cross sections of 3D data, which is easy to distribute but comes at the drawback of being harder to intuitively understand;
- Our VR applications allow users to manipulate the view of the camera to get a better view of whatever is being visualized in an immersive manner.
- New project on virtual exhibit of PGTC using mixed reality (MR).



Find our full VR demo

For potential collaboration and funding,
Contact: Guangyang Fang, gfang@umd.edu