



**HIWC Science Team Meeting**  
**held at**  
***National Center for Atmospheric Research***  
***Boulder, CO***  
***Nov 29&30 2023***

**Weather Radar Summary**

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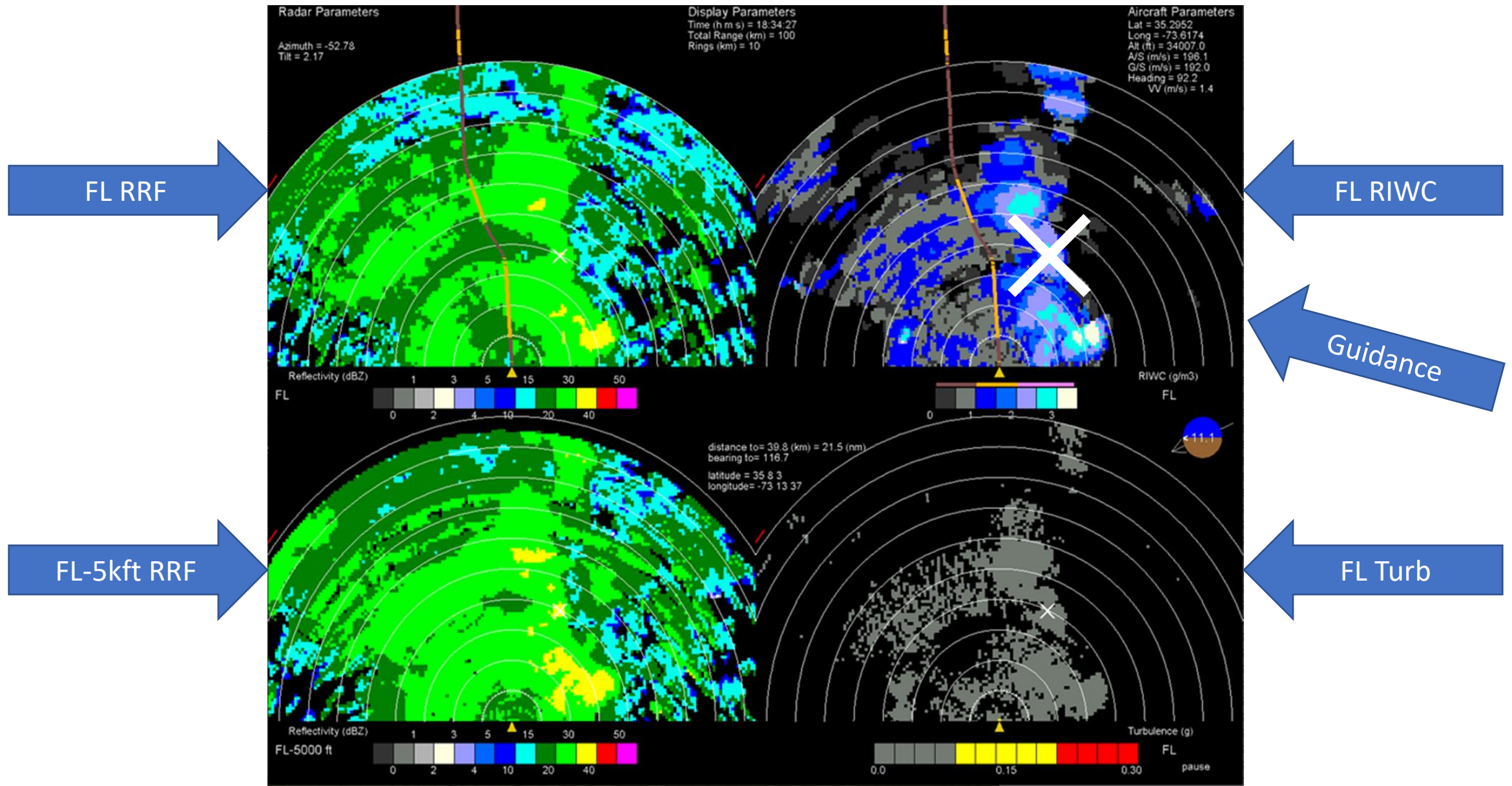


## **Weather Radar – Objectives**

- **Support Research Flight Operations**
  - **Provide Real-Time Assessment of RRF and HIWC Conditions**
  - **Provide Real-Time Guidance to PI and FD on Conditions and Flight Safety**
  - **Provide Operational Guidance/Navigation to Researchers to Enable Current Objectives and Setup for Future**
- **Collect Additional Radar Observations to Support/Expand Our Ever-Growing Database**
  - **Record I/Q Voltages and Aircraft State Data to Support Post-Campaign Analyses**
- **Assess Any Anomalous RIWC Behavior/Characteristics and Correlate with Measured Aerosol Concentrations**
  - **Qualitative Assessment of RIWC Performance; Specifically, Any RIWC Performance that Appears Anomalous**
  - **Post-Campaign Analyses that Establish Same/Different RIWC Performance**

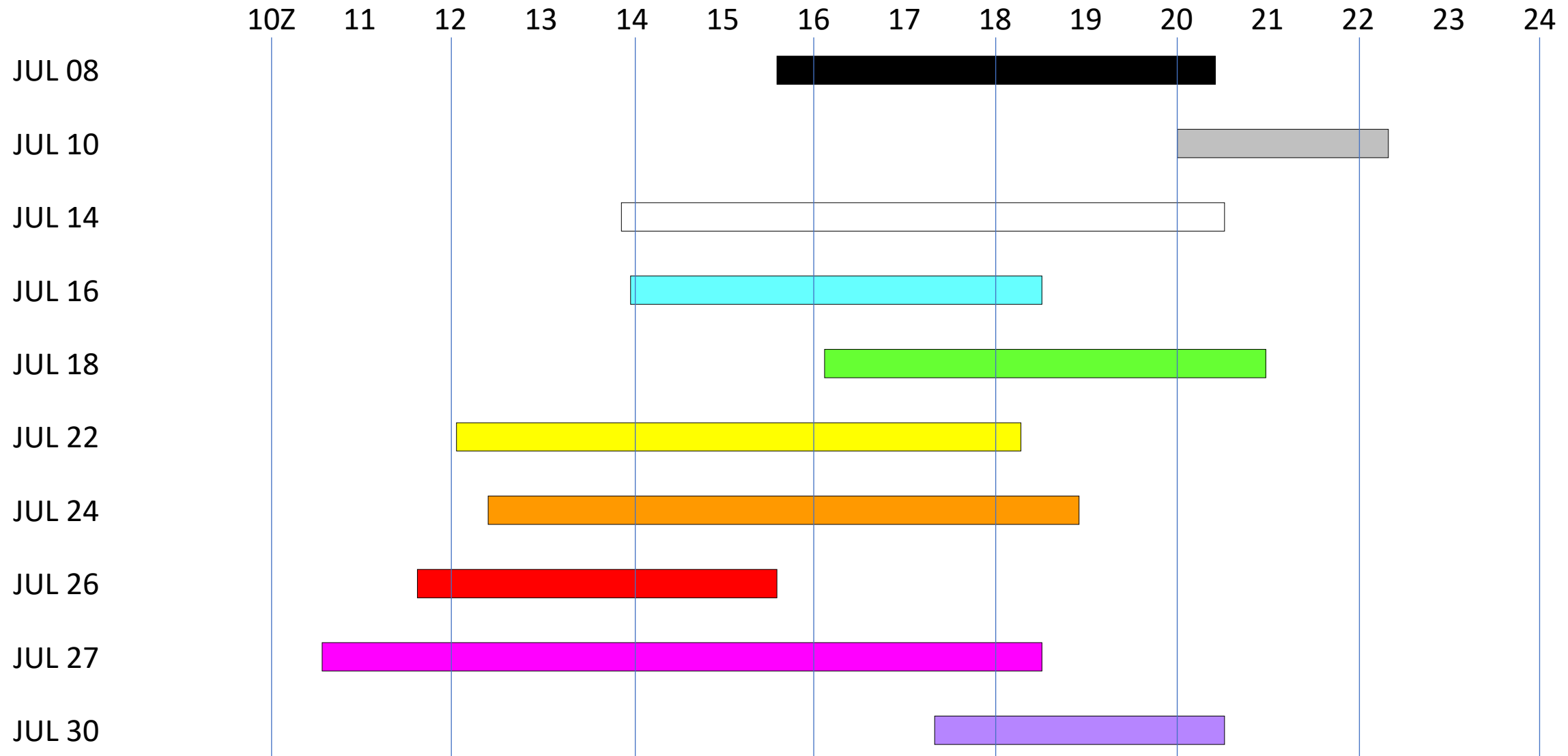


# Weather Radar – In-Flight Operations

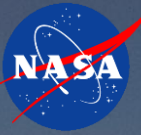




## Weather Radar – Recordings







## Weather Radar – Conclusions

- Weather Radar (hardware & software) worked well (same as 2015/2018)  
BUT single-operator operations are not recommended
- Future WXR implementations should automate data recording
- If S/W is redesigned, enable RHI operations (needs HF input)
- Swerling Process worked with same level of accuracy & fidelity as previous FC (2015/2018)
- Dataset (consistent with 2015/2018) delivered to FAA (NCAR) May 2023
- No change recommended to Swerling Coefficient due to aerosol concentrations
  - makes sense, NCD and ICW may or may not depend upon aerosol concentration
  - but radar scatters off whatever droplets are present thus independent of aerosol concentration
- BTW – Aerosol-dependence inquiry prompted our re-look at our Swerling Model (specifically the Swerling Coefficient); however, this analysis produced a minor refinement that improves RIWC correlation for higher IWC conditions