

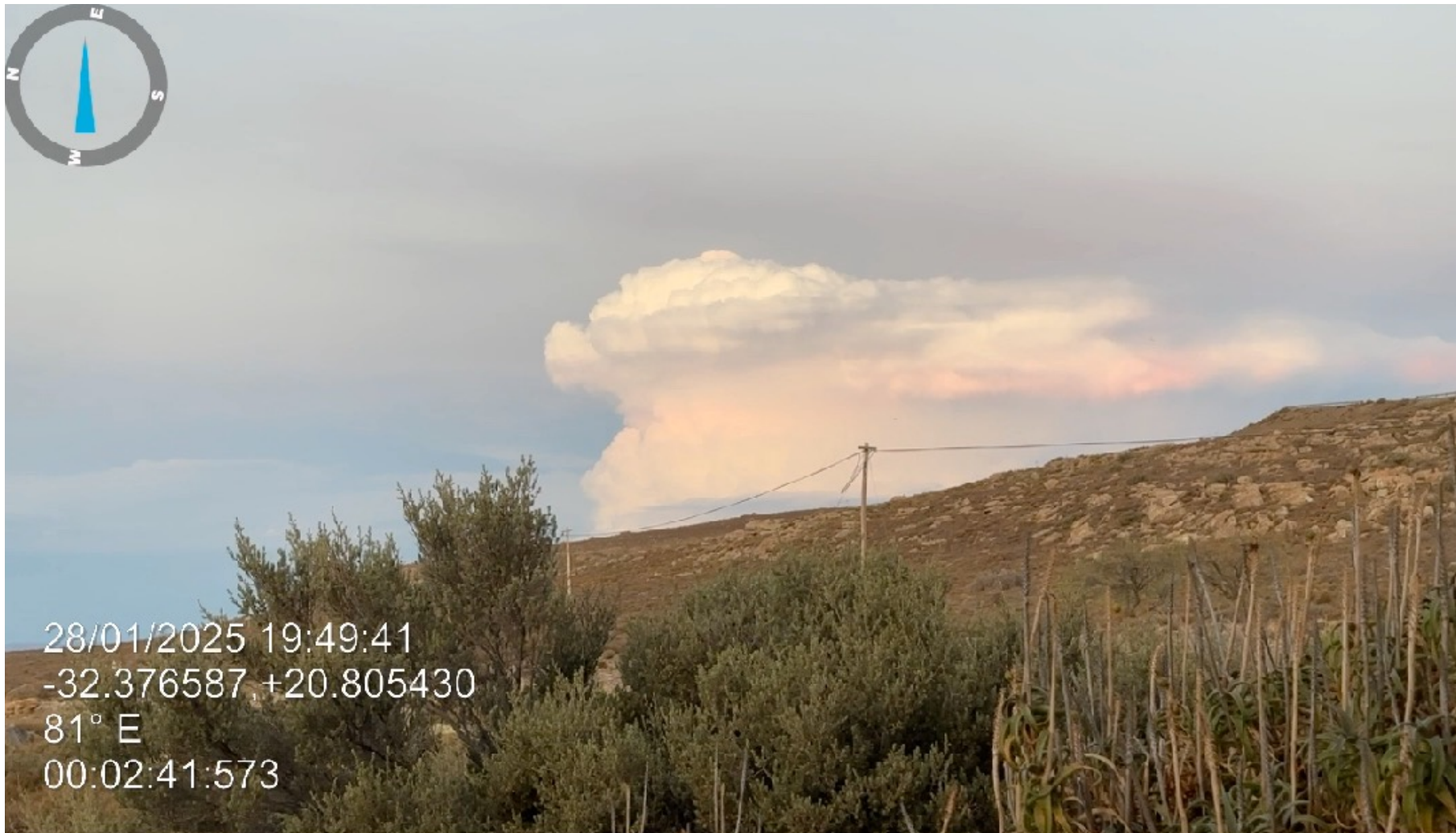
## Bolt from the Blue Caught on Video

**Martin Fullekrug and Michael Kosch**  
Thomas Blume, Gavin Dingley, Sven-Erik Enno,  
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**EGU**  
**May 5, 2026**



## Bolt from the Blue



**Sutherland, South Africa, SAAO**

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**Sutherland, South Africa, SAAO**

## Bolt from the Blue



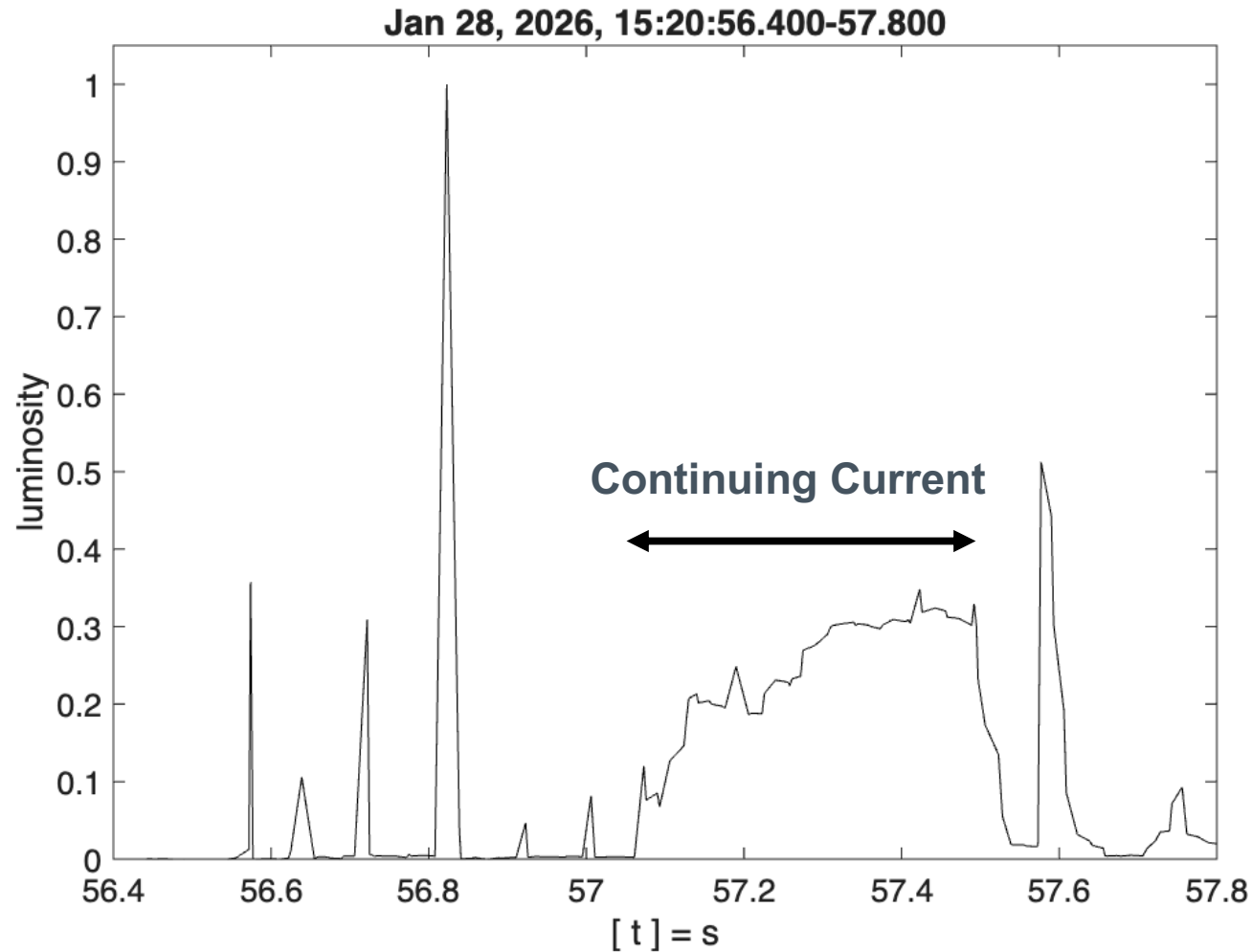
**Sutherland, South Africa, SAAO**

## Continuing Current, ~450 ms long



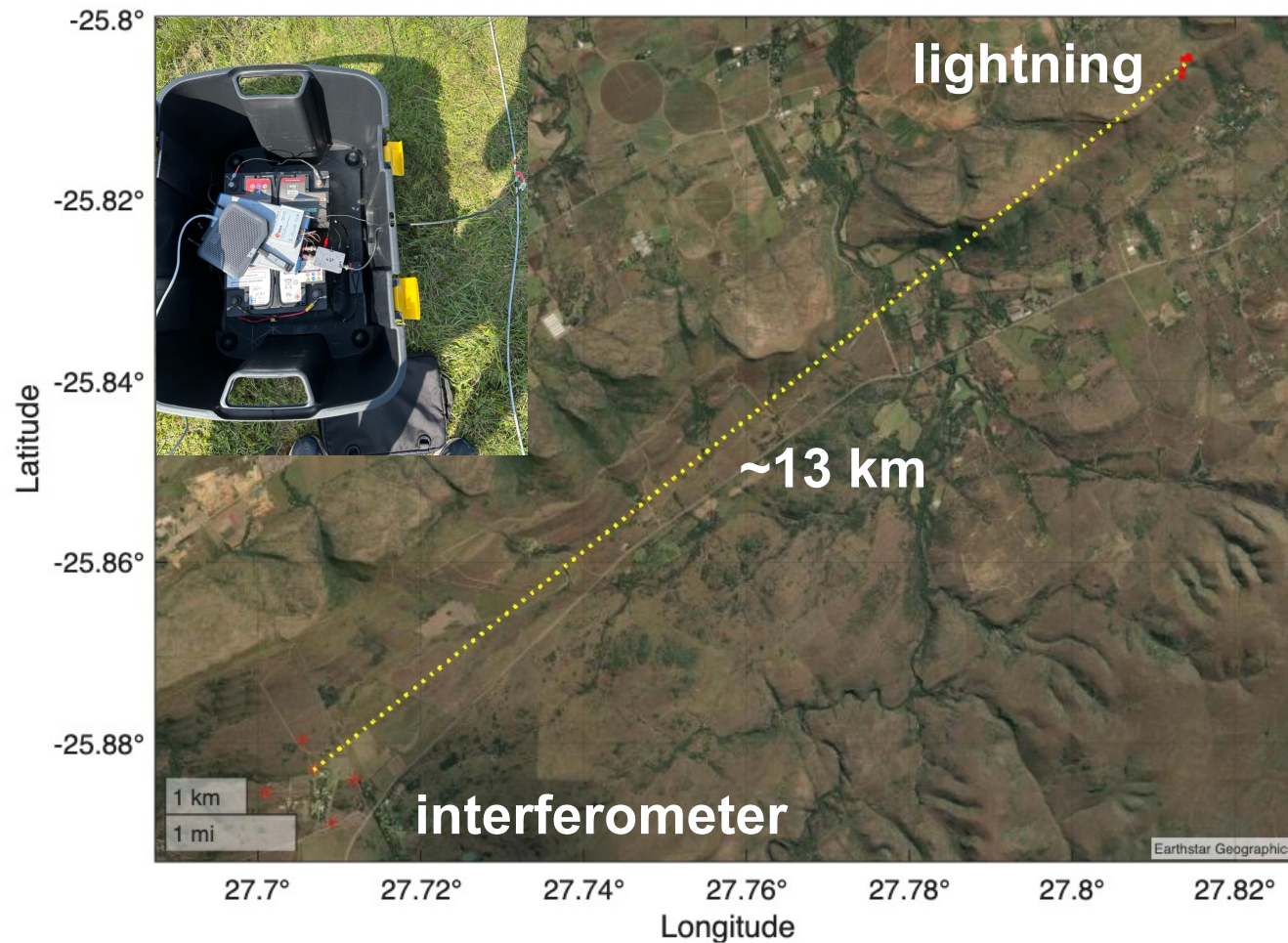
**Hartebeesthoek, South Africa, SANSA**

# Luminosity shows 9 strokes, CC no 7



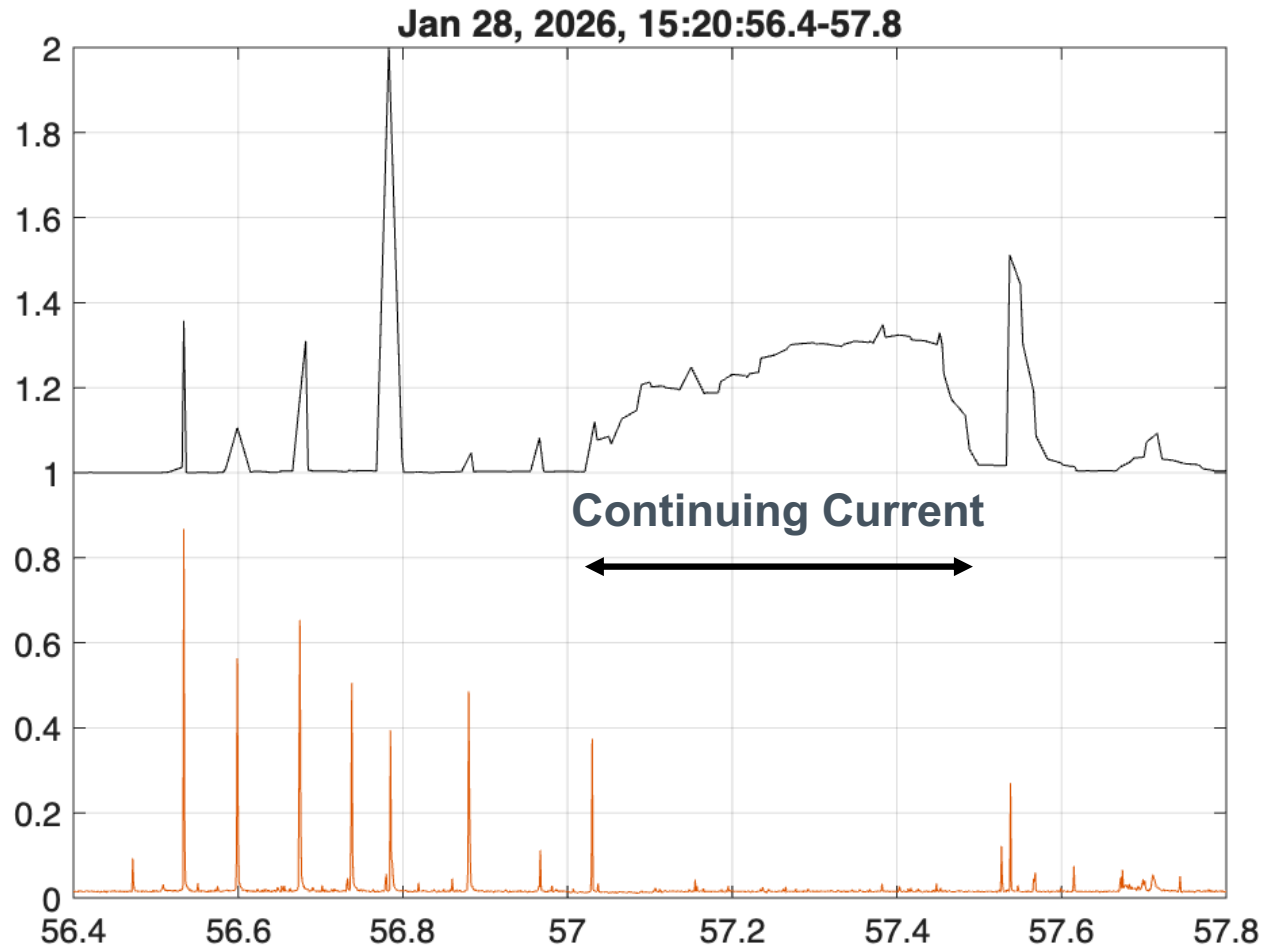
Hartebeesthoek, South Africa, SANSA

# Interferometric array ~13 km from lightning



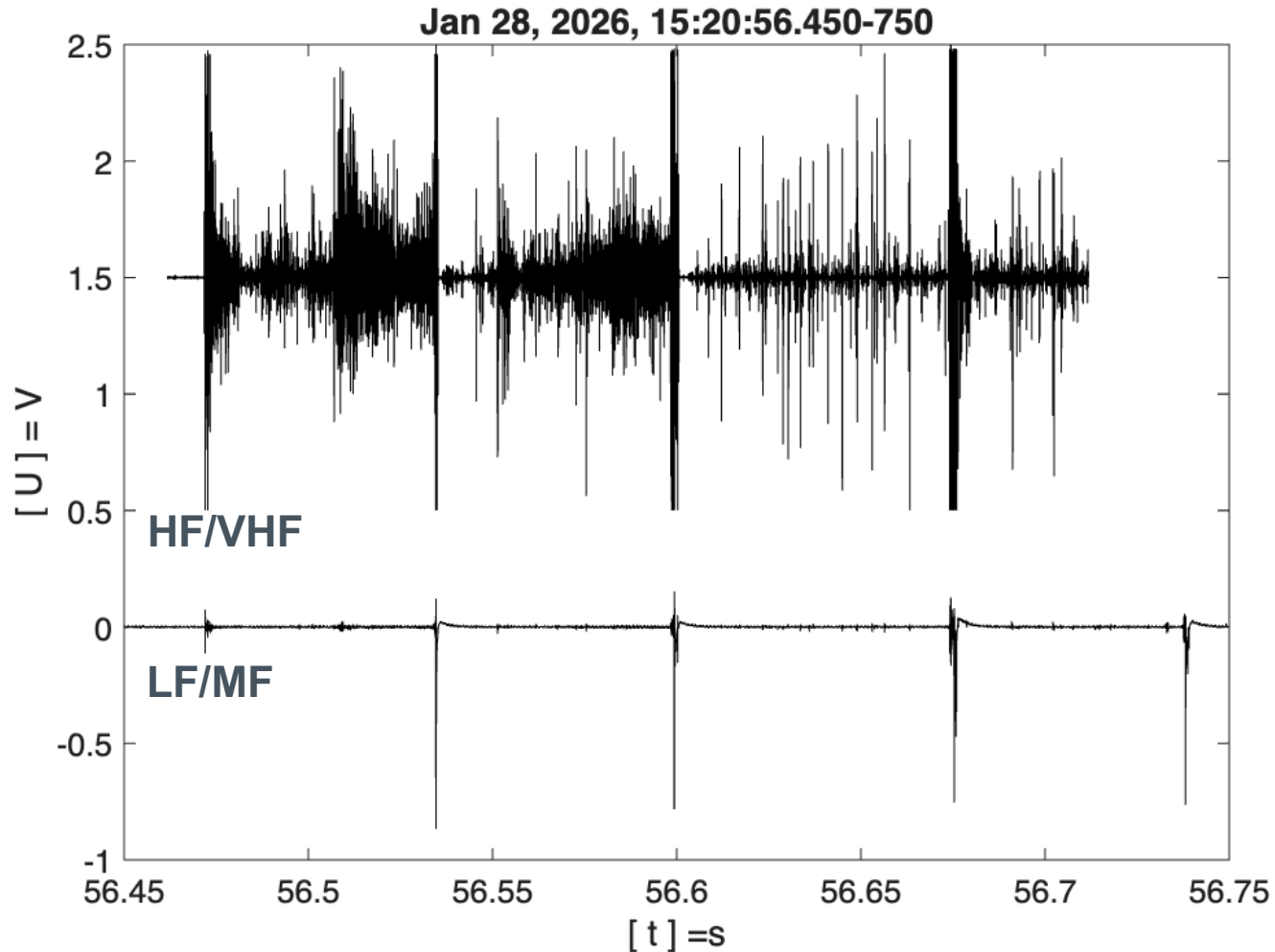
**Hartebeesthoek, South Africa, SANSA**

# Comparison of luminosity with 1-400 kHz radio



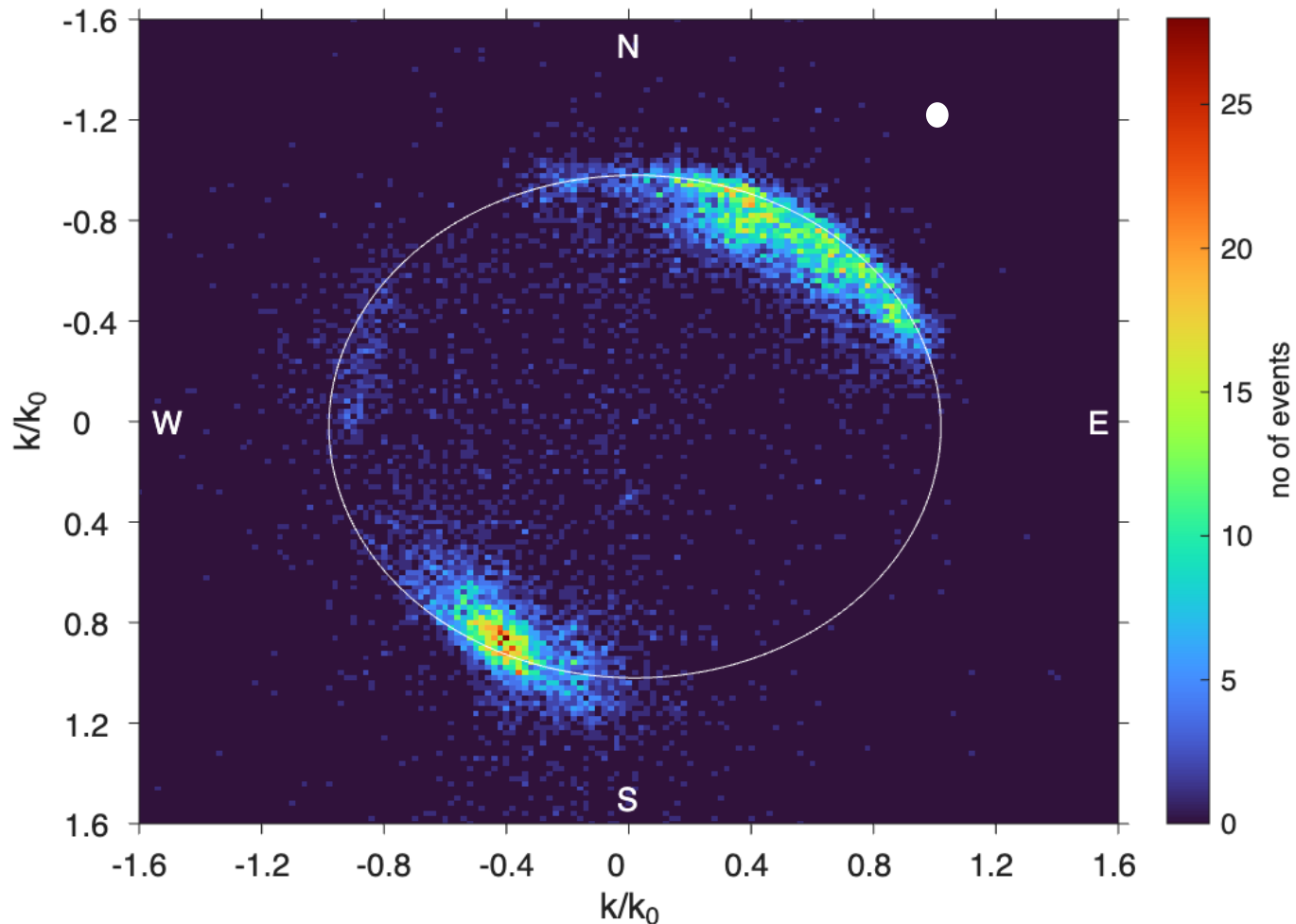
Hartebeesthoek, South Africa, SANSA

# Comparison of 0.1- 5 MHz with 1-400 kHz radio



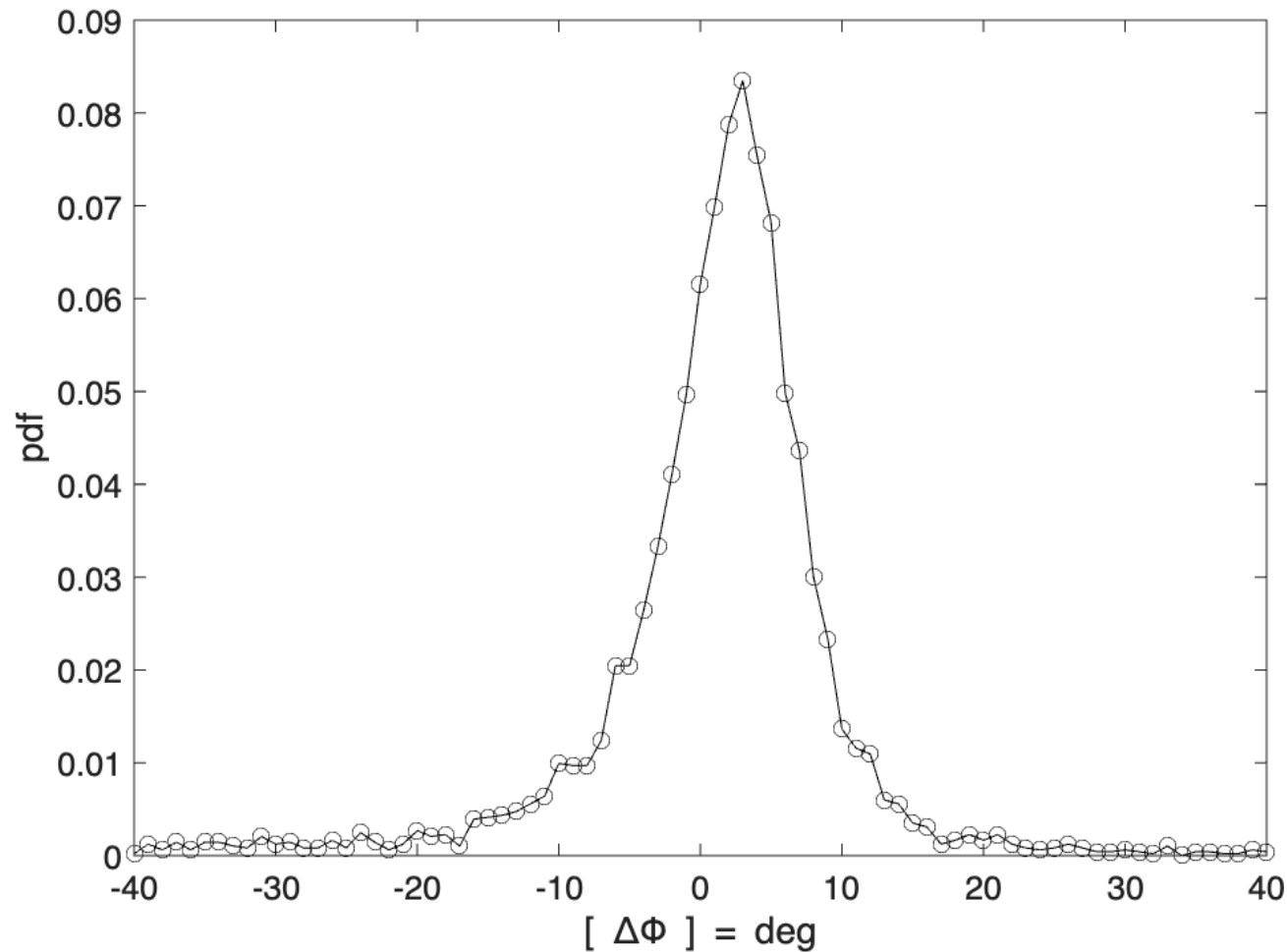
Hartebeesthoek, South Africa, SANSA

# Lightning Stroke Interferometry



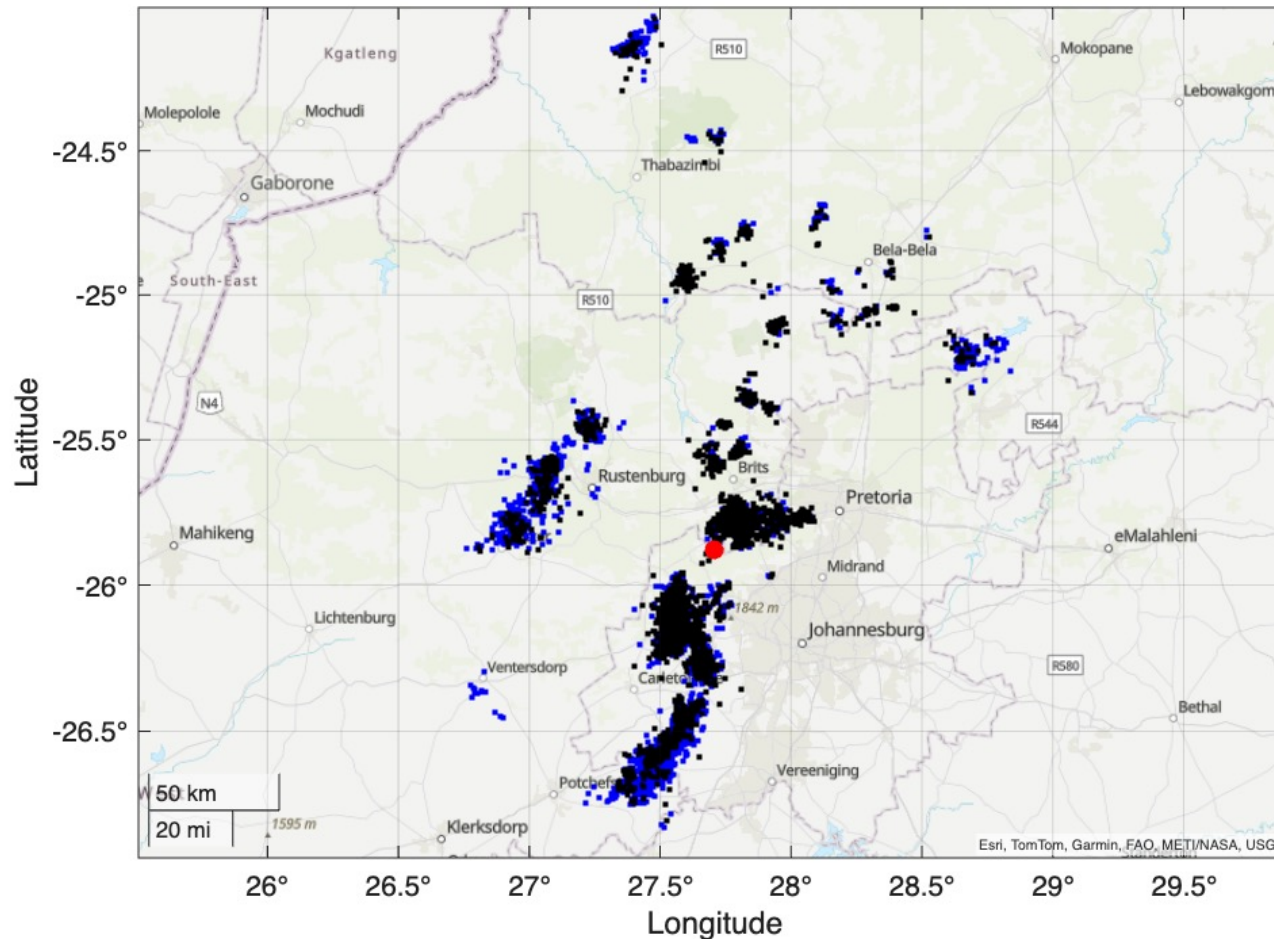
Hartebeesthoek, South Africa, SANSA

# Arrival Angle Differences compared to ENTLN



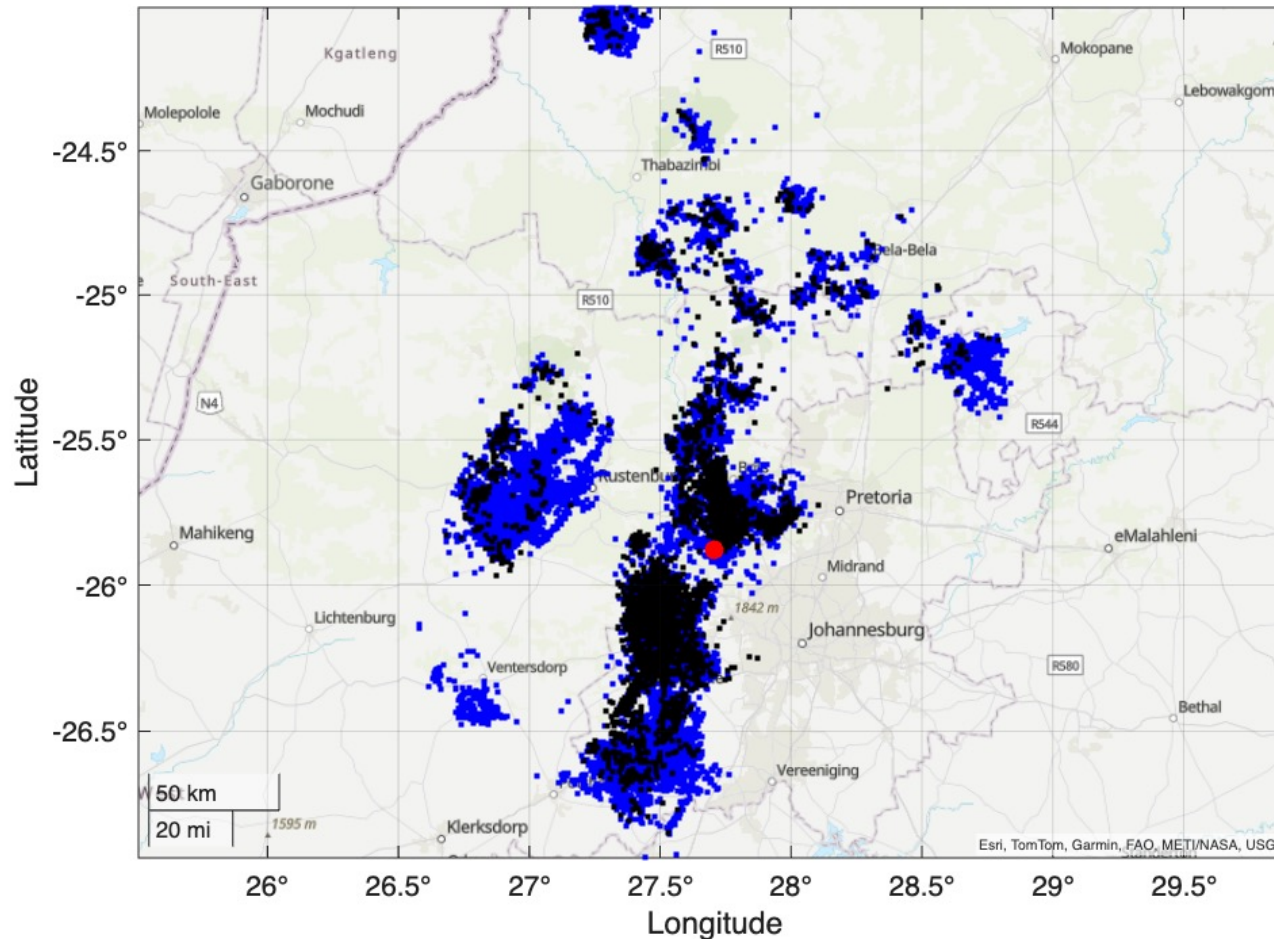
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# Detection Efficiency - Interferometer / ENTNLN



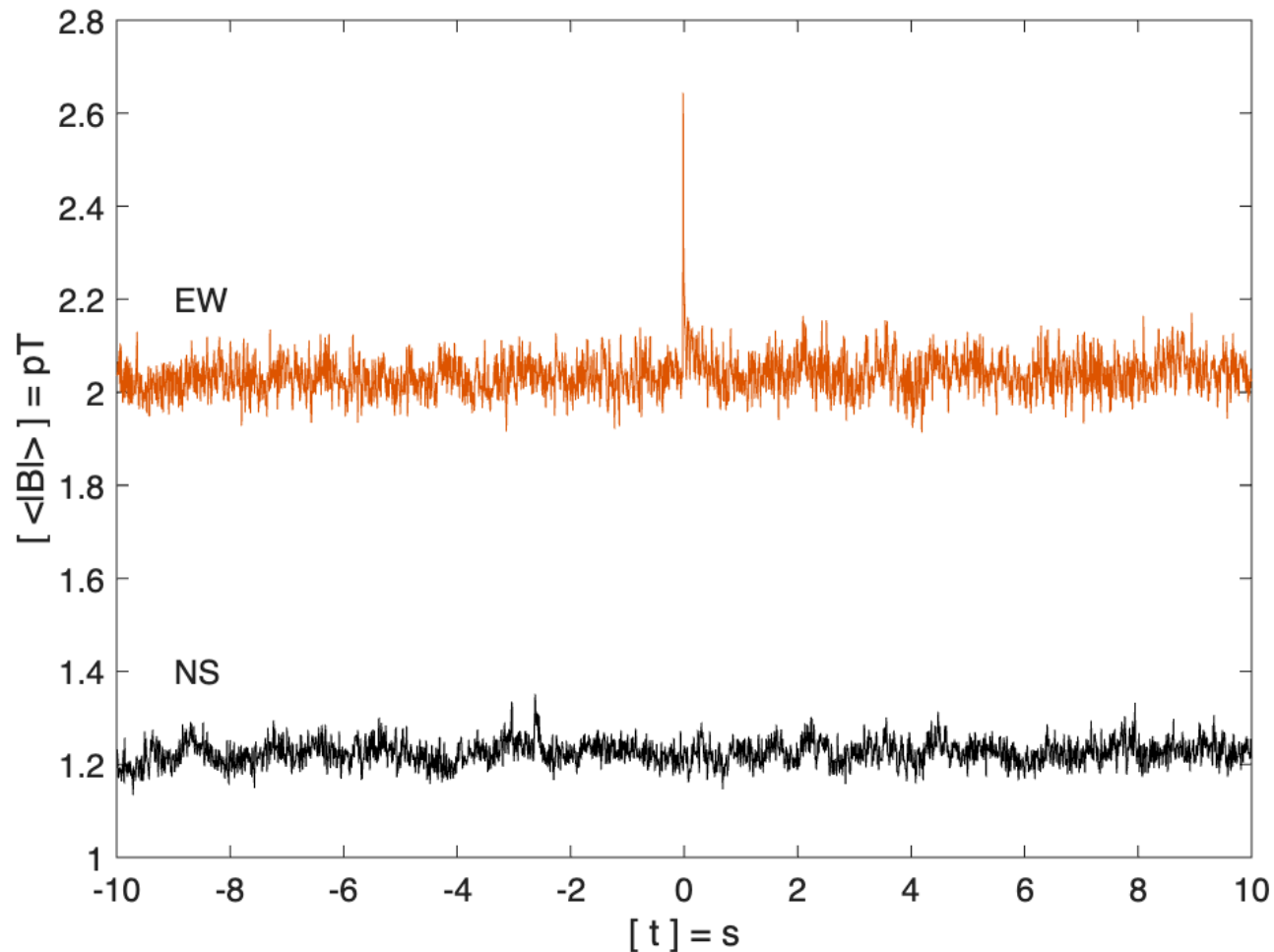
**Hartebeesthoek, South Africa, SANSA**

# Detection Efficiency - Interferometer / MTG-LI



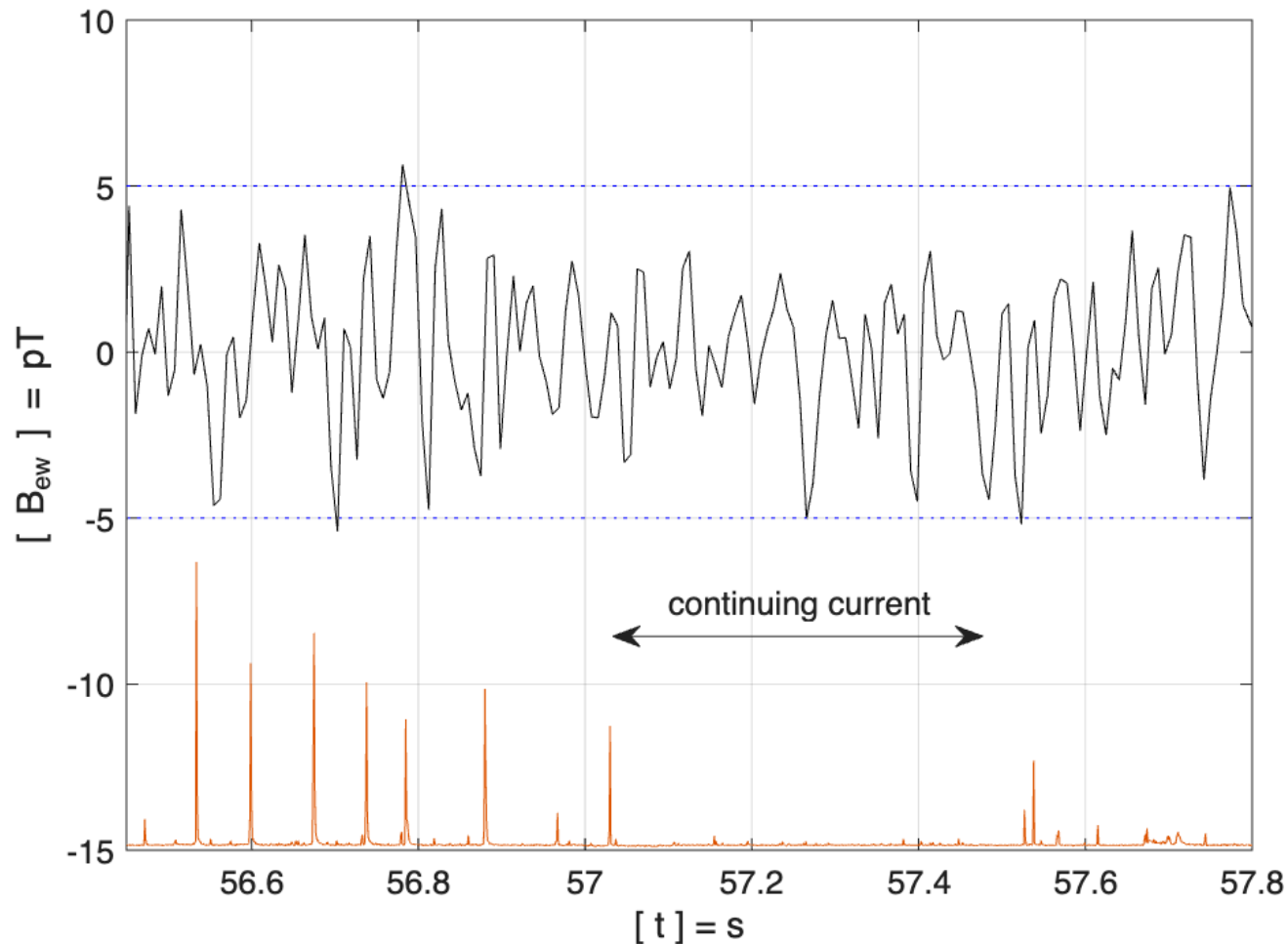
**Hartebeesthoek, South Africa, SANSA**

## Average lightning detection at ~9,500 km (~1-49 Hz)



Geomagnetic Observatory Eskdalemuir, Scotland

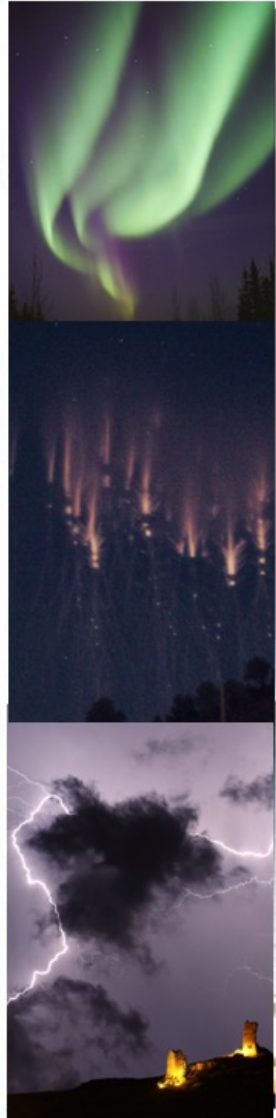
# Upper bound $B \sim 5 \text{ pT}$ from current moment



Geomagnetic Observatory Eskdalemuir, Scotland

## Upper bound for continuing current

- 1 kA km – 75 pT at 9,500 km distance
- 5 pT – 67 A km
- lightning channel length from video 2.6 km
- current  $I_{max} < 67 \text{ A km} / 2.6 \text{ km} = \mathbf{26 \text{ A}}$
- small current when compared to return stroke
- small current can still be damaging and deadly, as a result of the long duration ~450 ms



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