

# Near-Field Interferometry of **Lightning** with LOFAR

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LOFAR Family Meeting, 4 June 2024



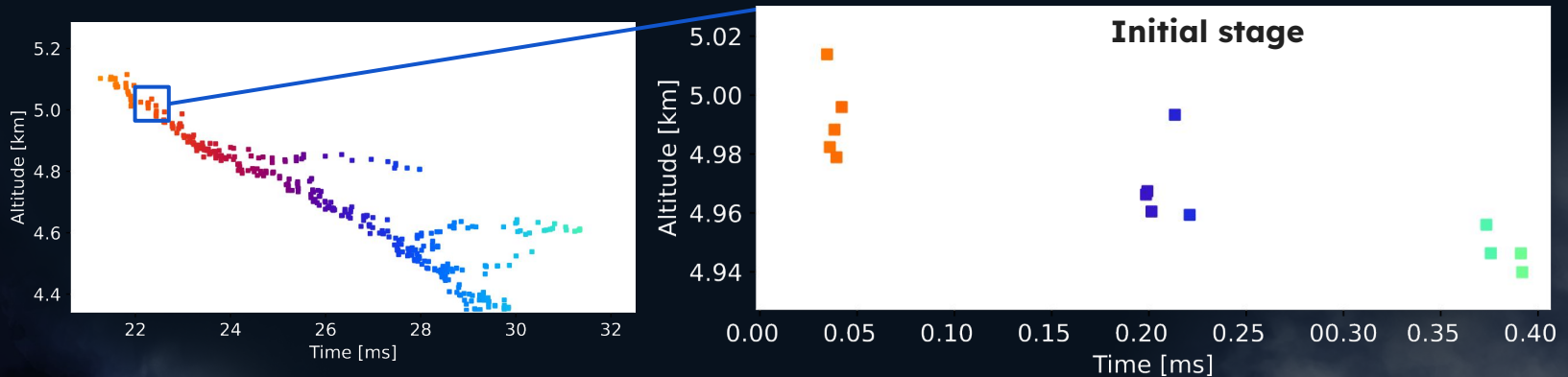
university of  
 groningen



# Near-Field Interferometry of **Lightning** with LOFAR

Fast and compact

- Pulse separation ~ **microseconds**
- Speeds up to **relativistic**



# Near-Field **Interferometry** of Lightning with LOFAR



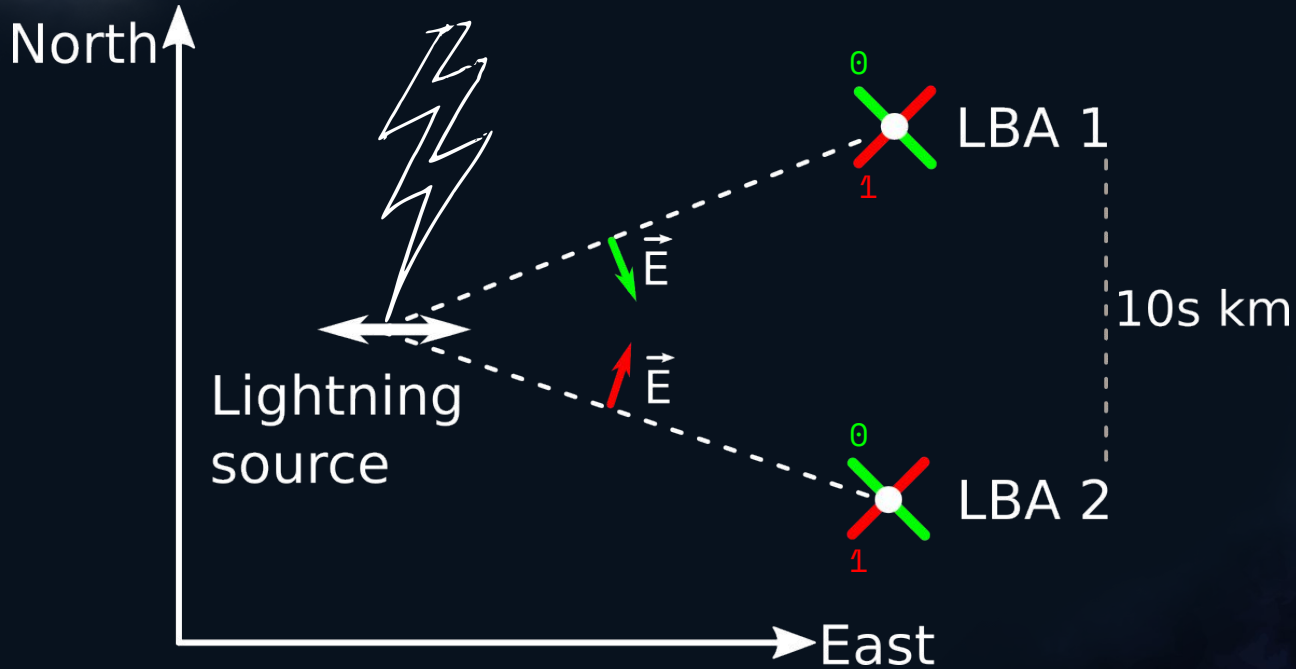
Every lightning pulse varies in polarization and frequency

- 300,000+ **radio pulses**/flash
- Pulse width: ~20 ns



# Near-Field Interferometry of Lightning with LOFAR

- Two antennas observe different polarizations for the same source



# Near-Field Interferometry of Lightning with **LOFAR**

Not a lightning instrument (!)

- Fast physics
  - ⇒ Short integration time (250ns)
  - ⇒ Great temporal resolution
  - ⇒ Can't integrate over noise
  - ... Antenna function matters



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