

EGU-2022: A range of different negative leader propagation modes as imaged with LOFAR



university of
 groningen

kvi - center for advanced
 radiation technology

Olaf Scholten
for the LOFAR-lightning Imaging group
O.Scholten@rug.nl

Normal negative leaders:

Time resolved 3Dinterferometric imaging of a section of a negative leader with LOFAR:

[Phys Rev D104, 063022](#)

[arXiv:2104.11908](#)

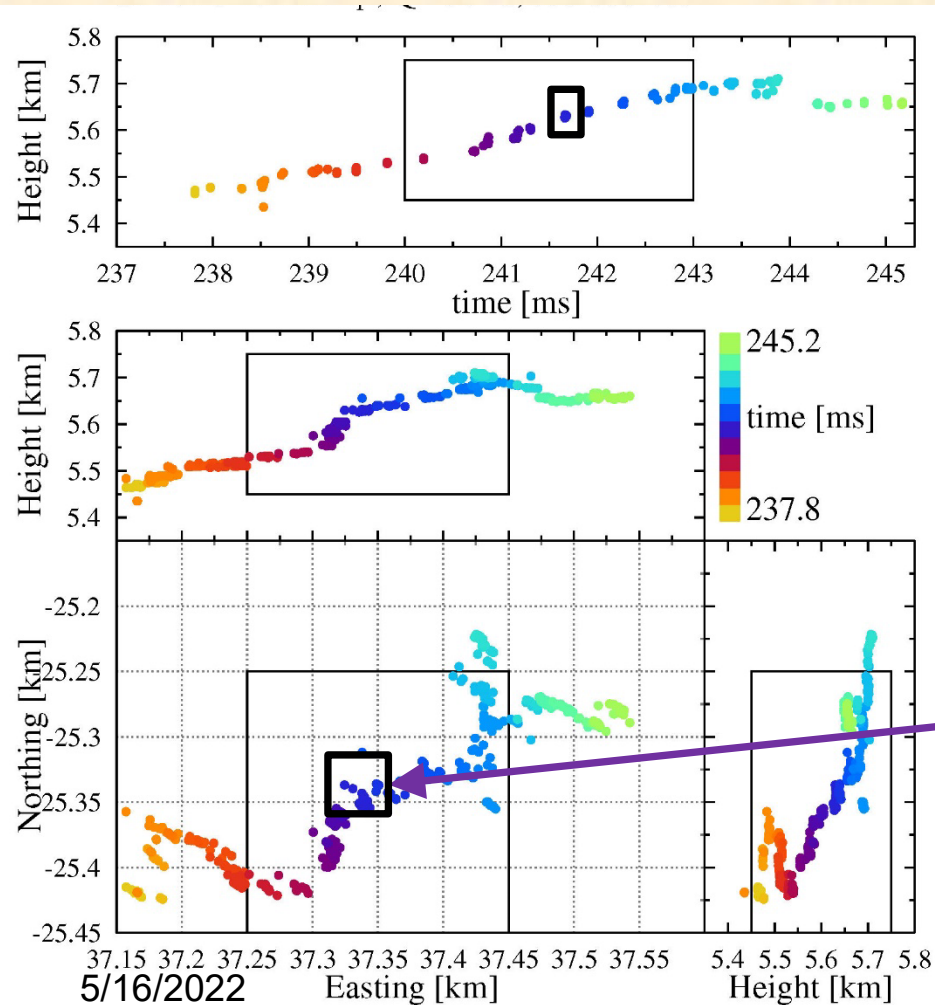
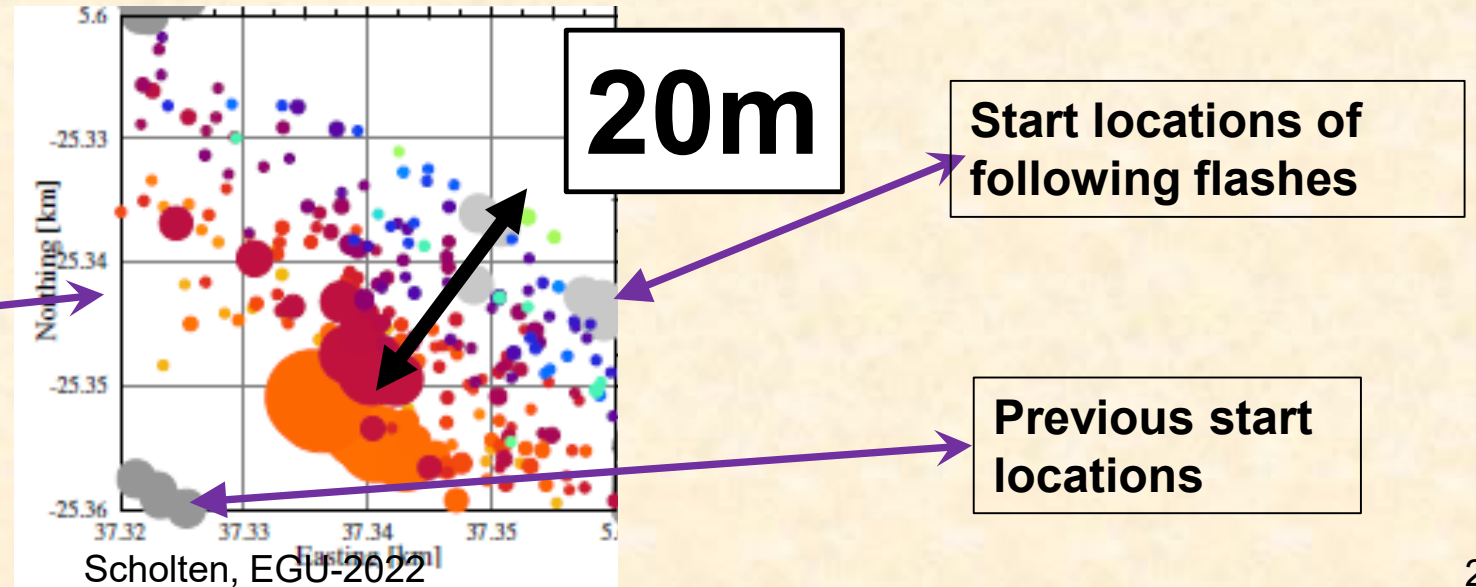
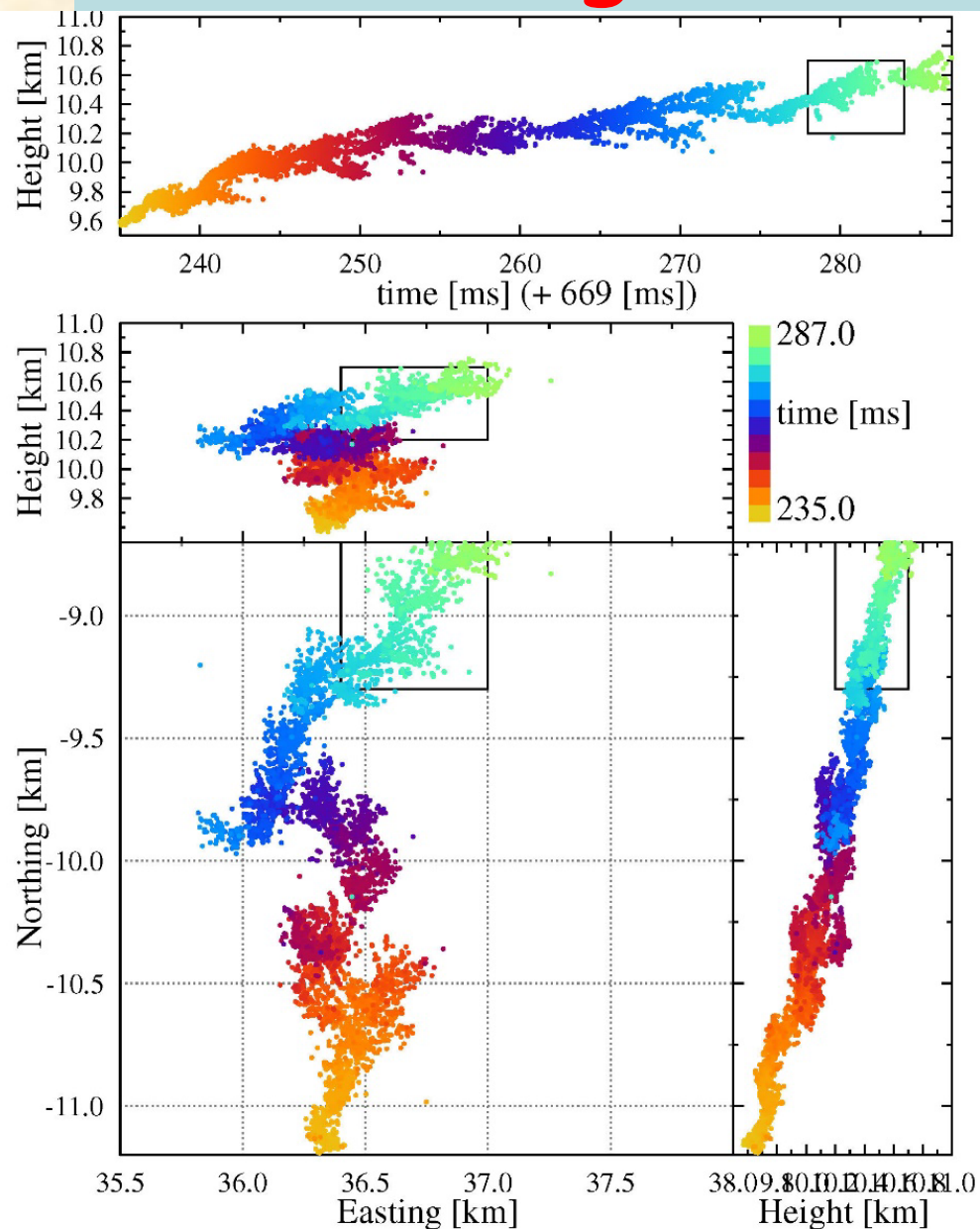


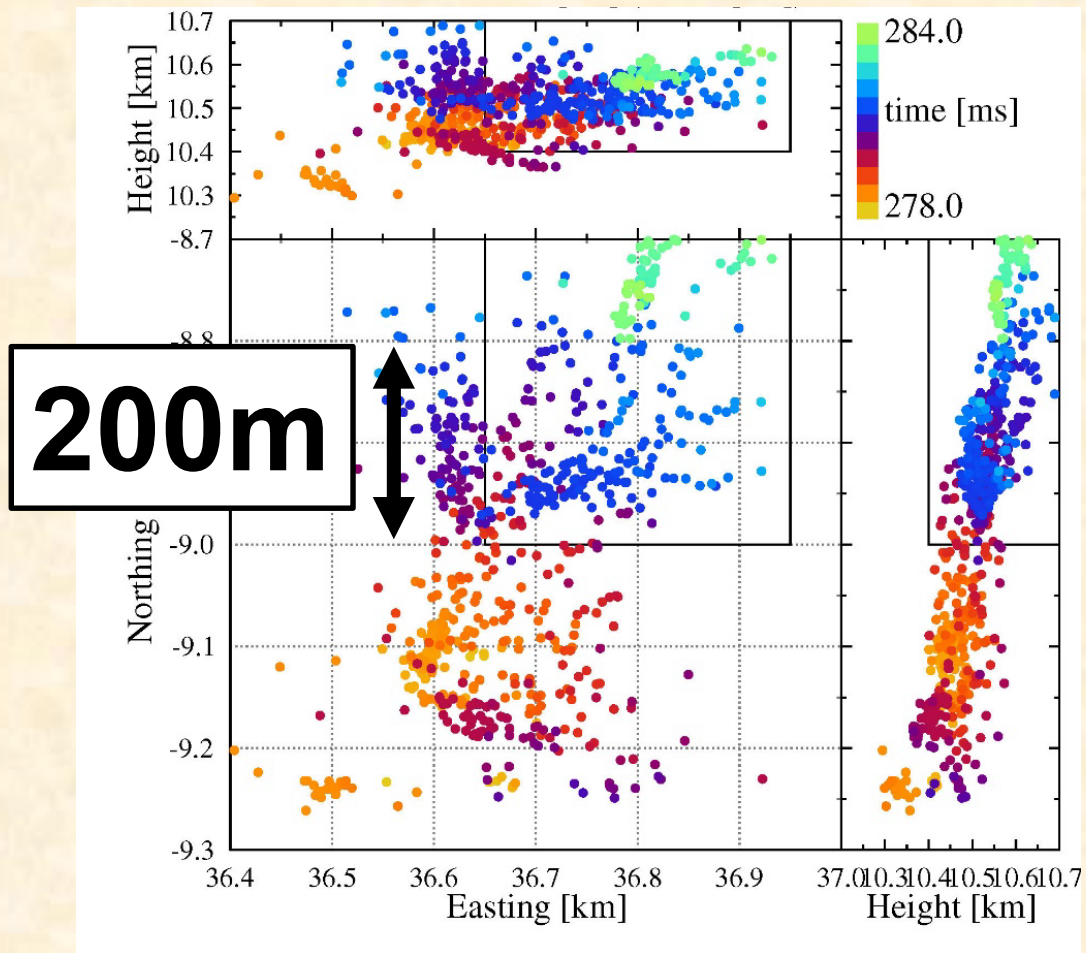
Image dynamics inside a corona flash



High Altitude Negative Leaders



[Atmospheric Research 260, \(2021\) 105688](#)

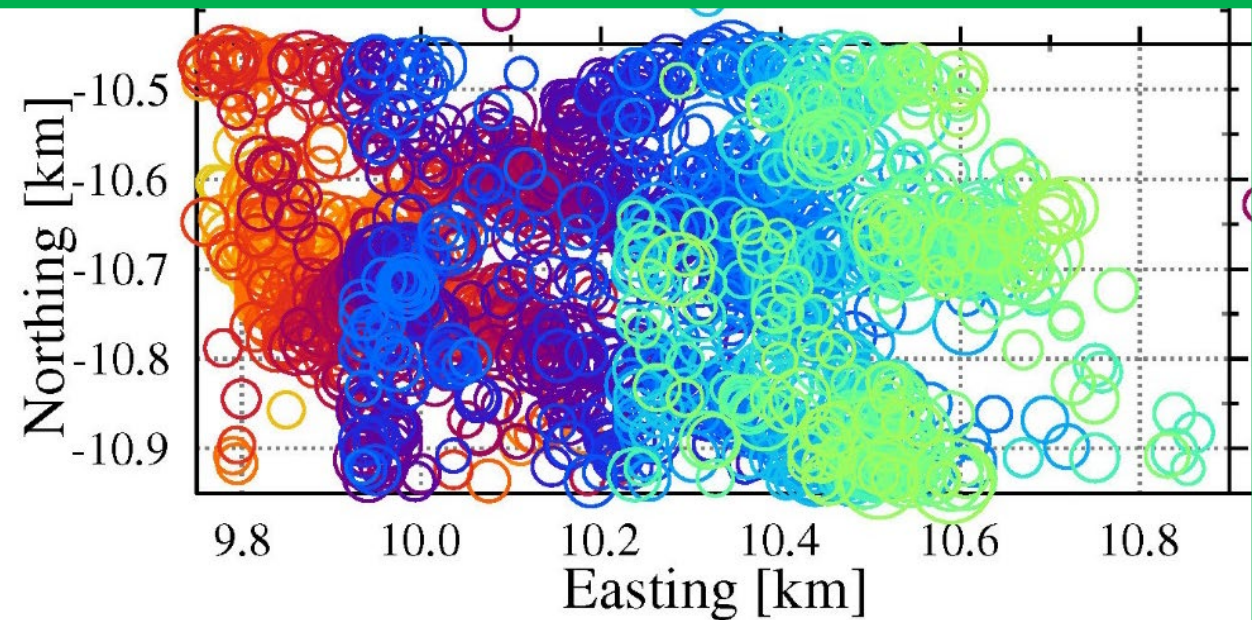
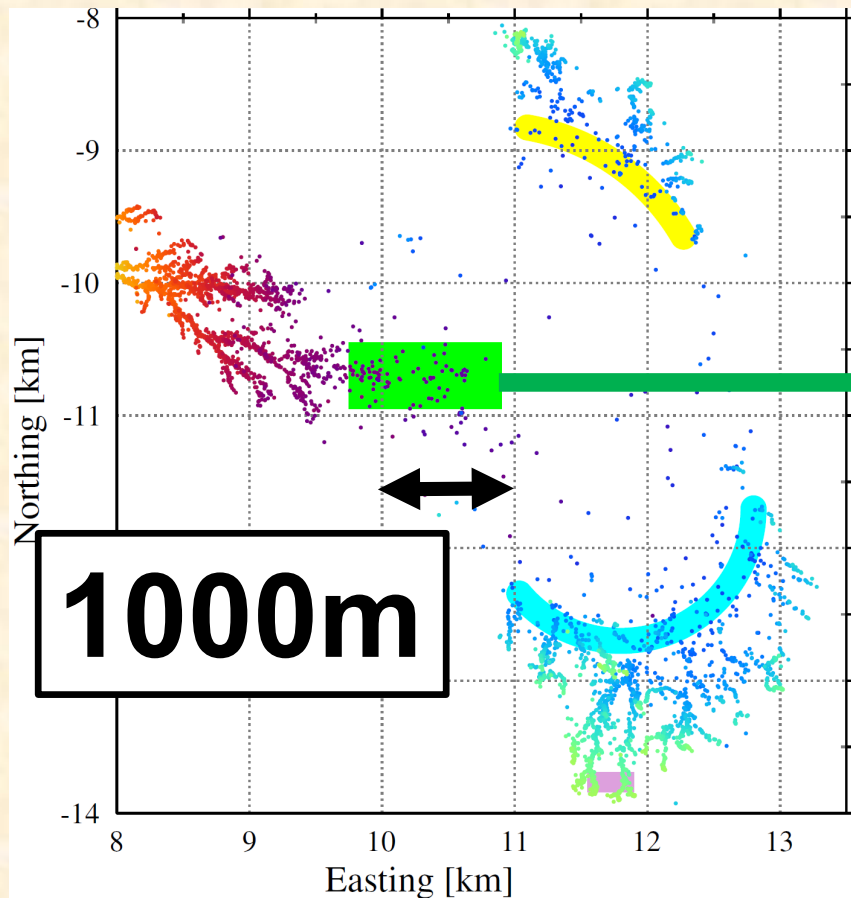
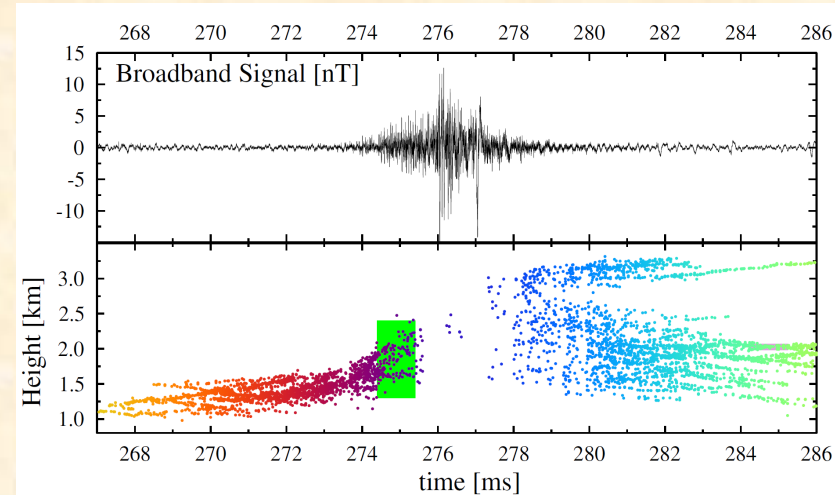


Scholten, EGU-2022

Intensely Radiating Negative Leader

[Scientific Reports](#) volume 11, Article number: 16256 (2021)
[Phys. Rev. D](#) 105, 062007 (2022)

**Volumetric discharge
over $3 \times 3 \times 1 \text{ km}^3$**



Negative Leaders

Above ~8km altitude:

High Altitude NL; Corona flashes of ~ 200 m

Below ~7km altitude: Normal NL, but sometimes

Intensely Radiating NL; massive corona flashes over few km³

100 times more power than NNL

Site for TGF ???

Contact: O.Scholten@rug.nl

700m

