MANCHESTER 1824
The University of Manchester

eMERLIN

# eMERLIN+EVN status update

Eskil Varenius
Operational Support Scientist
Jodrell Bank Observatory

EVN TOG meeting 2018-03-19
Shanghai Astronomical Observatory

MANCHESTER 1824
The University of Manchester

eMERLIN

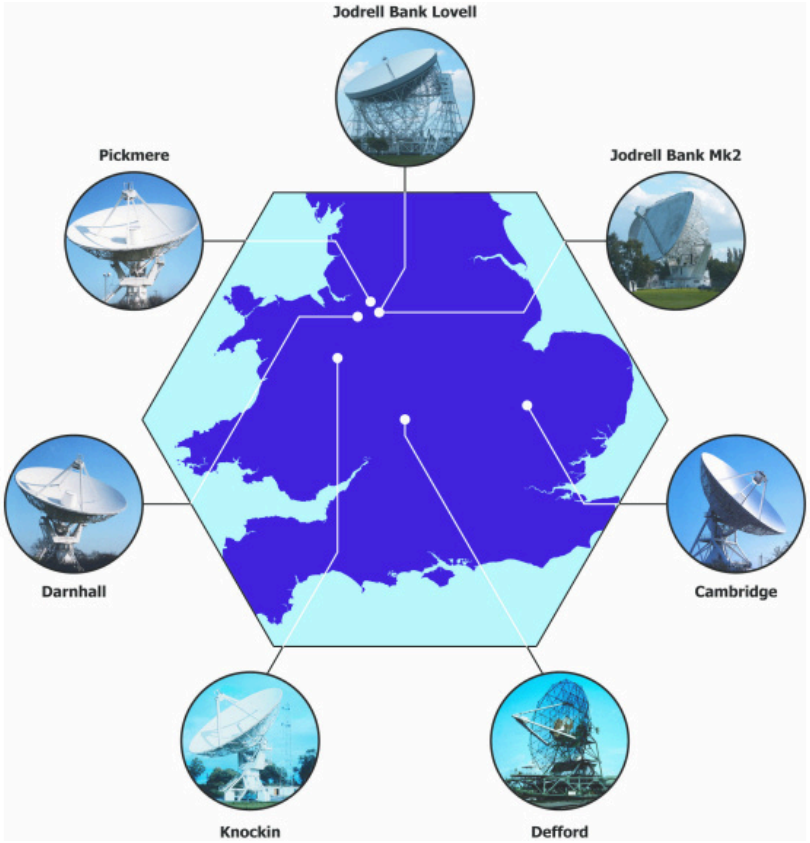
# Outline

- Why eMERLIN in EVN?
- What works already?
- What doesn't work (yet)?
- Plans and priorities
- Summary

MANCHESTER 1824
The University of Manchester

eMERLIN

# Why eMERLIN in EVN?

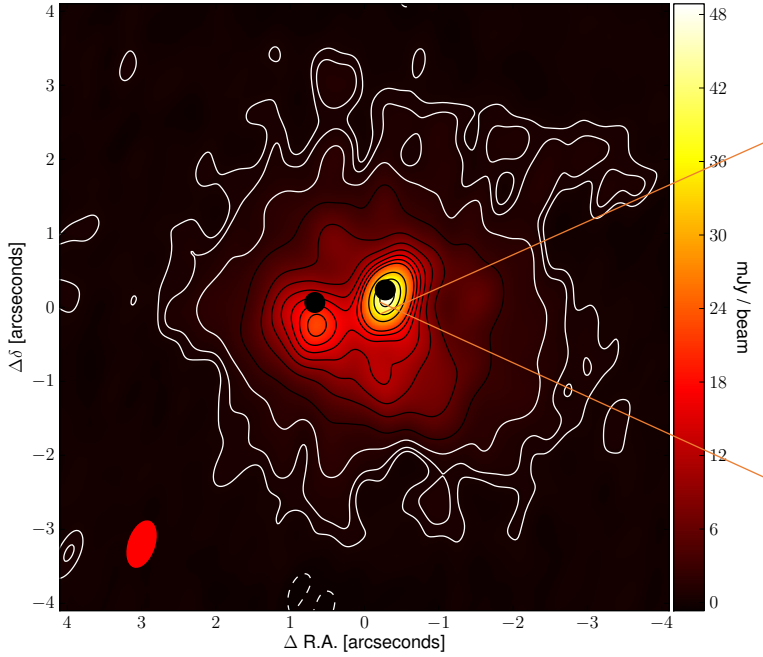



**Baselines (i.e. science) !**

VLA (<36 km) <-> eMERLIN *(11 km to 217 km)* <-> EVN (>100 km)

# Why eMERLIN in EVN?

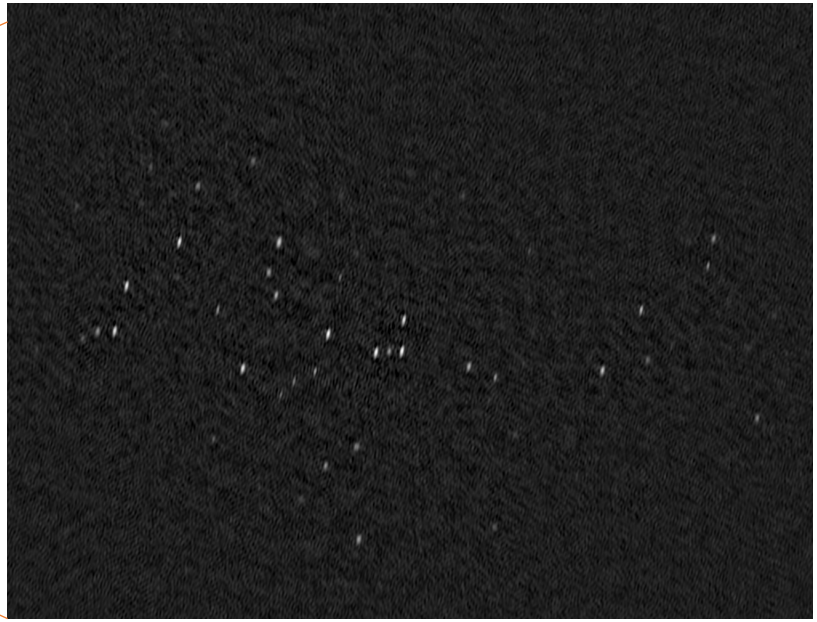
Ultra-Luminous Infrared Galaxy Arp 220
**0.5 arcsec** @ 150 MHz
Int. LOFAR (Varenius et al. 2014)




?

**50-5 mas**

Ultra-Luminous Infrared Galaxy Arp 220
**0.5 mas** @ 5 GHz
Global VLBI (Varenius et al., submitted)



**Baselines (i.e. science) !**

VLA (<36 km) <-> eMERLIN *(11 km to 217 km)* <-> EVN (>100 km)

MANCHESTER 1824
The University of Manchester

eMERLIN

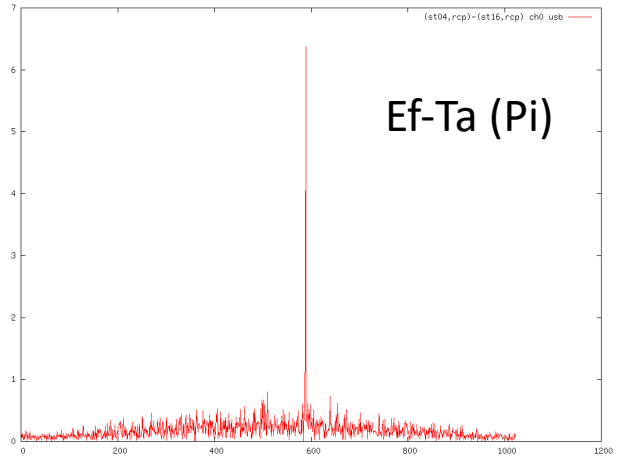
# What works already?

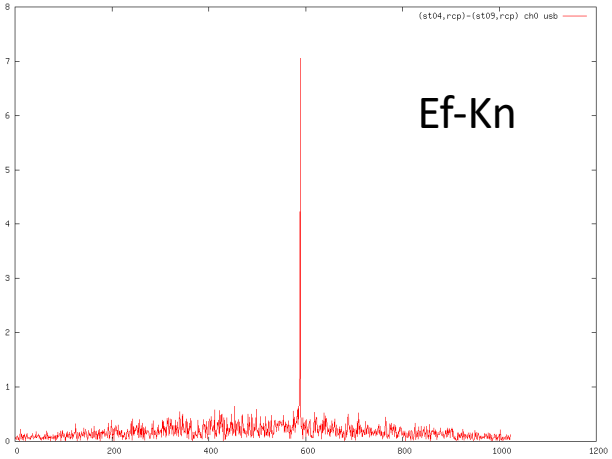
- eMERLIN stand-alone WIDAR L + C-band
- Jb1/2 FS+DBBC2 2Gbps (e)VLBI (partially)
- eMERLIN+EVN 6cm 512Mbps WIDAR VDIF fringes!

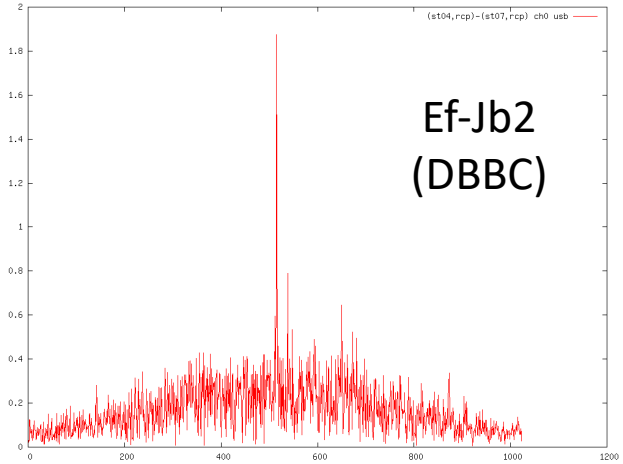
MANCHESTER 1824
The University of Manchester

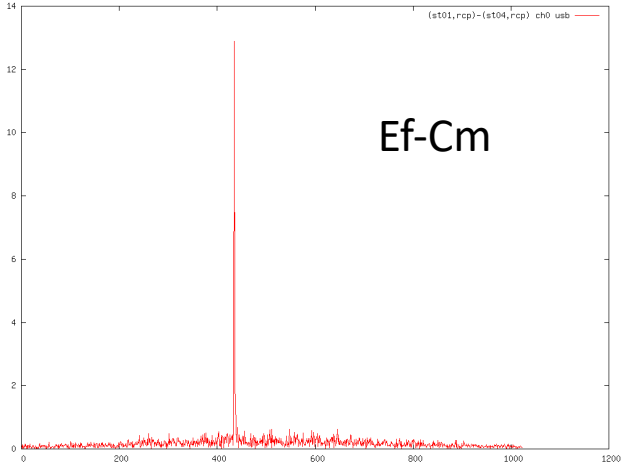
eMERLIN

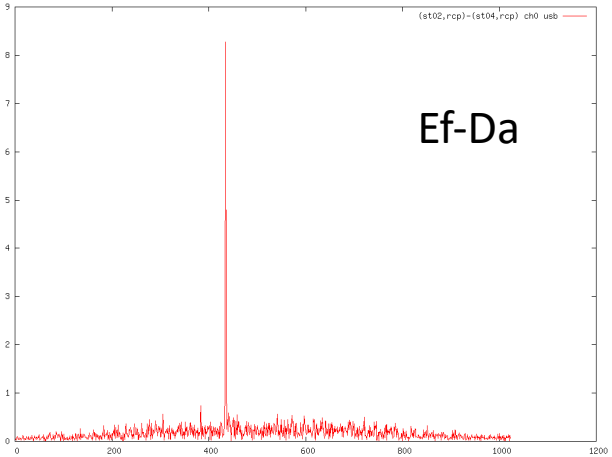
# 6cm eMERLIN+EVN fringes! (N18C1)

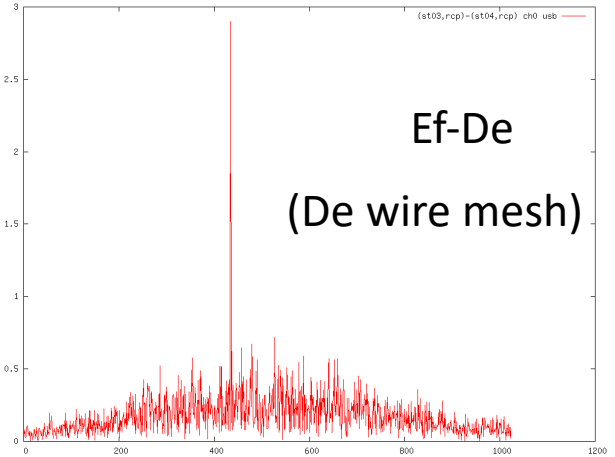



**Note:** Jb2 (and Jb1) can be improved

MANCHESTER 1824
The University of Manchester

eMERLIN

# What doesn't work (yet)?

- eMERLIN in EVN sampler stats (L,C,K-band) :

  - WIDAR VDIF AGC not fully optimized

- Jb1 and Jb2 in EVN with DBBC (partially):

  - JBO FS + DBBC setup can be improved (e.g. ampcal)

- eMERLIN stand-alone WIDAR K-band:

  - All receivers work but needs commissioning

- WIDAR á priori amplitude calibration

MANCHESTER 1824
The University of Manchester

eMERLIN

# Plans and priorities

- WIDAR AGC issues (2 months)
- Jb1/2 FS + DBBC improvements (6 months)
- Jb1/2 continuous amp. cal. (6 months)
- eMERLIN K-band commissioning (6 months)
- WIDAR á priori amp. cal. (12 months)
- WIDAR VDIF 512Mbps -> 1Gbps (12 months)

MANCHESTER 1824
The University of Manchester

eMERLIN

# Summary

- Clear recent eMERLIN + EVN fringes!
- When WIDAR AGC issues fixed:

  -> eMERLIN+EVN L, C-band 512 Mbps/ant (e)VLBI
- eMERLIN K-band -> eMERLIN+EVN K-band VLBI
- Improve JBO FS+DBBC setup and amp. cal.
- Long term: WIDAR amp. cal. + 1 Gbps VDIF