

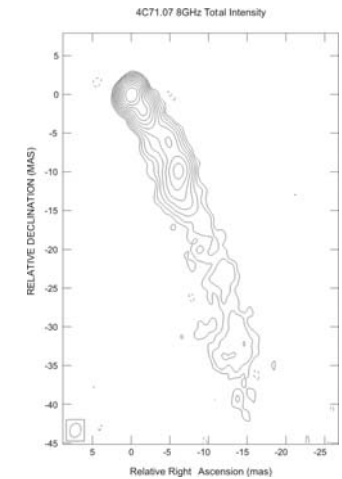
Dual-frequency polarization observation of the 4C71.07 jet

The ongoing search for helical magnetic fields

Andreas Papageorgiou, Cork institute of Technology
8th ENIGMA meeting, Espoo, Finland – 6 Sep 2006

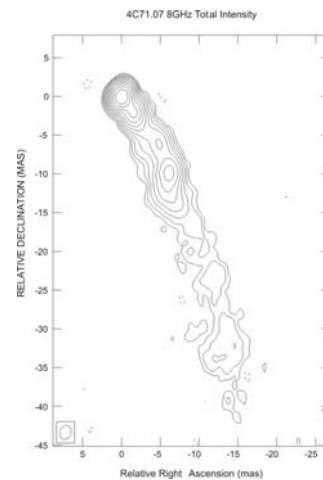
The Jet

- 4C71.07 (0836+710)
- $z = 2.17 - 1 \text{ mas} = 4 h^{-1} \text{ pc}$ ($q\alpha=0.5, H\alpha=100 h \text{ km/s/Mpc}$)
- Strongly polarized in all wavelengths
- Can be traced up to 180 mas from the core (0.3GHz)
- pc-scale jet, straight, continuous structure, a few knots, Faraday corrected MVPA parallel to jet direction.
-
- Observation presented here: 1997.9 – 8 & 15GHz

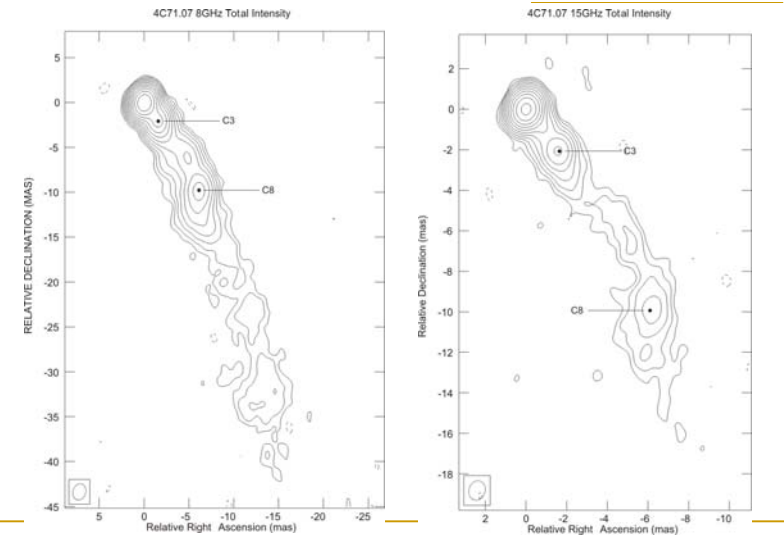


The aim of the observation

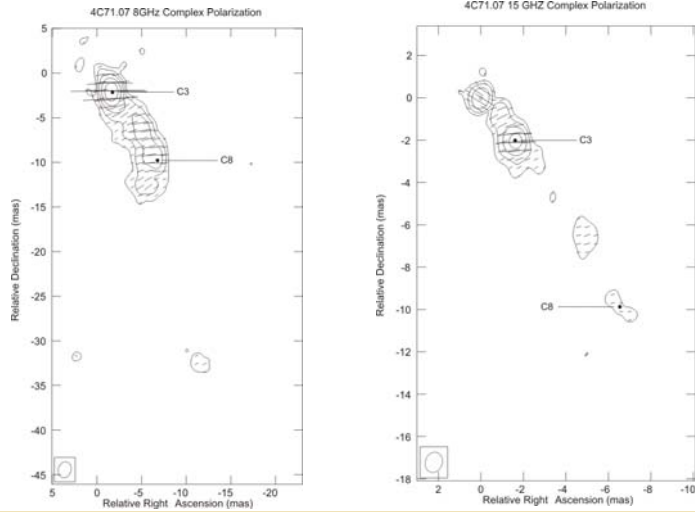
- Original proposal:
 - Study the faraday corrected MVPA behaviour at the jet's knots.
- My aim:
 - Compare transverse polarization structure with Helical field predictions.



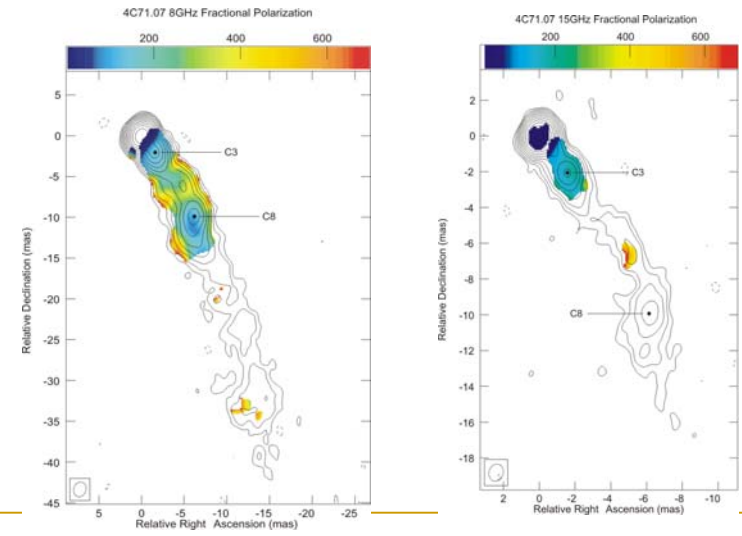
Total Intensity images



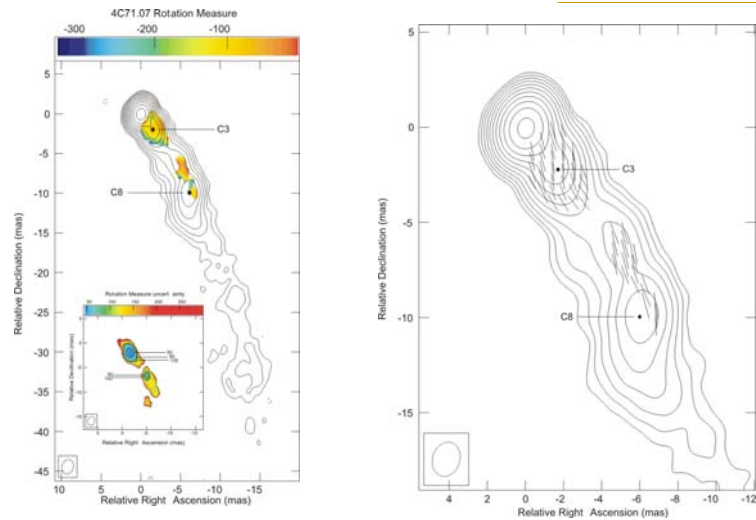
Polarized Intensity and EVPA



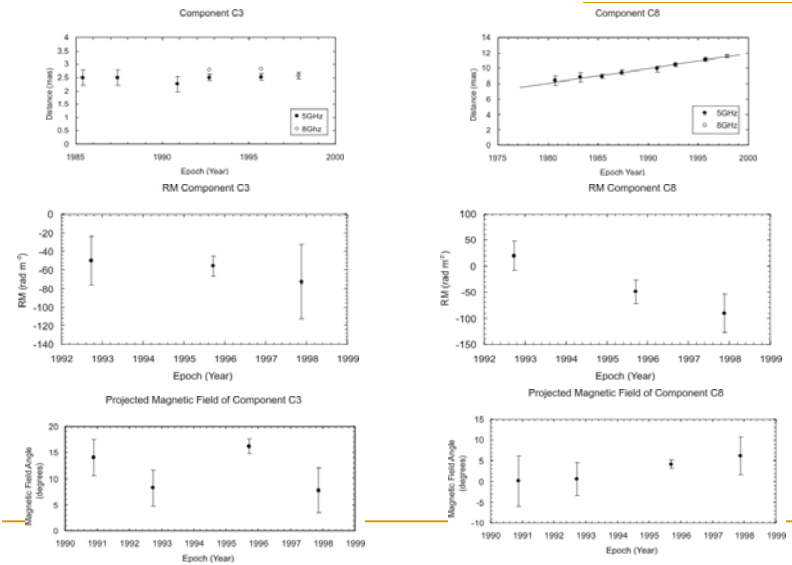
Fractional polarization



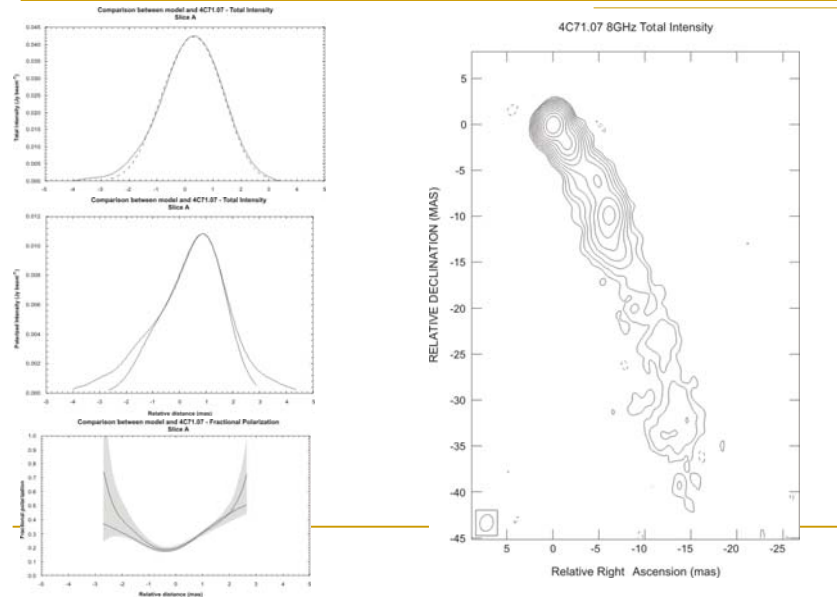
Rotation Measure & MVPA



Component evolution



Comparison with Helical field model



Helical field models

- Currently, two approaches
 - Asymmetries in transverse I, P, MVPA
 - Asymmetries in Faraday RM
- As it is, the two different methods probe different regions of jets
 - Former: Field geometry from synchrotron emitting jet.
 - Later: Field geometry of the medium surrounding the synchrotron emitting jet
- Should these geometries be the same?

Future work

- Regarding 4C71.07
 - 1.6 GHz VSOP polarization observation (Epoch 2001)
 - Will provide RM with higher accuracy ($\sim 3\text{-}5 \text{ rad/m}^2$) → Better look at the RM asymmetry presented here.
 - Add a 4th point at the Component C8 RM evolution (Maybe, just maybe, the RM is decreasing, will have to get my SF analysis software out)
- Generally
 - Look for data on more sources to compare with Helical field models
 - Sources should preferably be continuous, long with no bends

Final note on Helical Fields

- WHY BOTHER?
- Questions:
 - Are they really there?
 - Is there evidence for them?
- If yes:
 - Are they common?
 - Is there any preference in pitch angles?
 - How do pitch angles evolve along the jet?