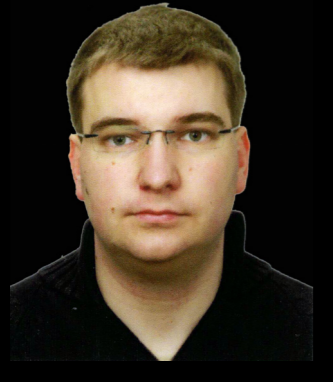


Galactic foreground simulations and observations at low radio frequencies

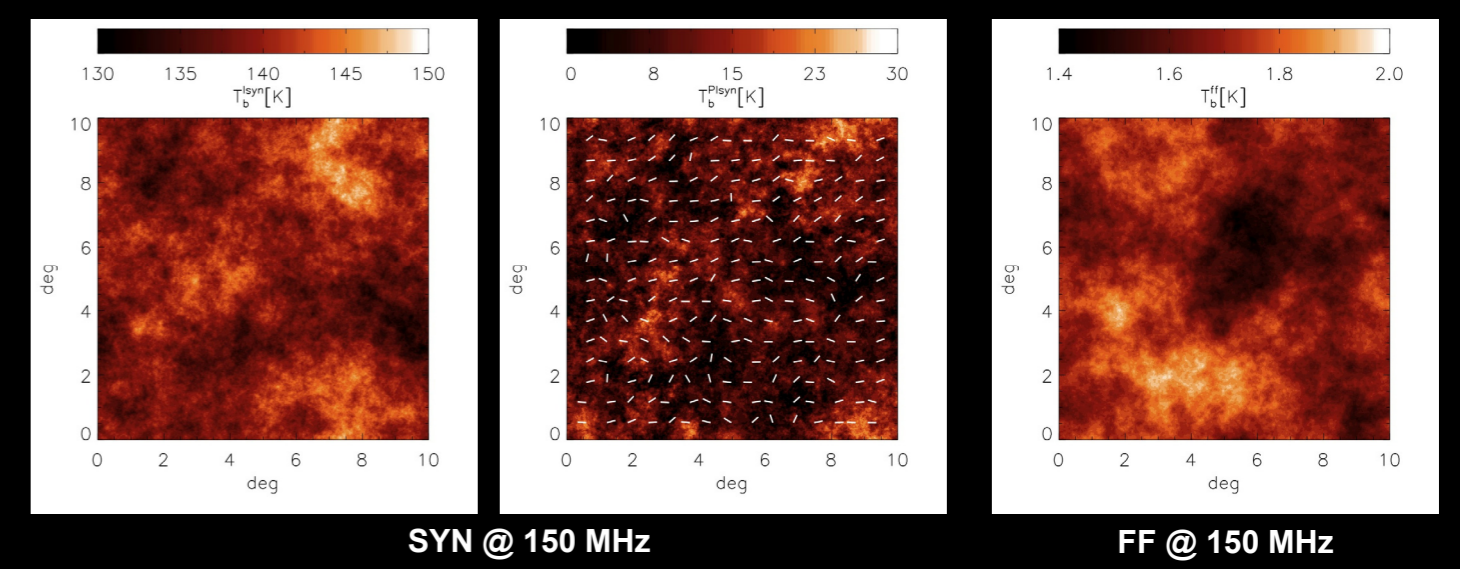
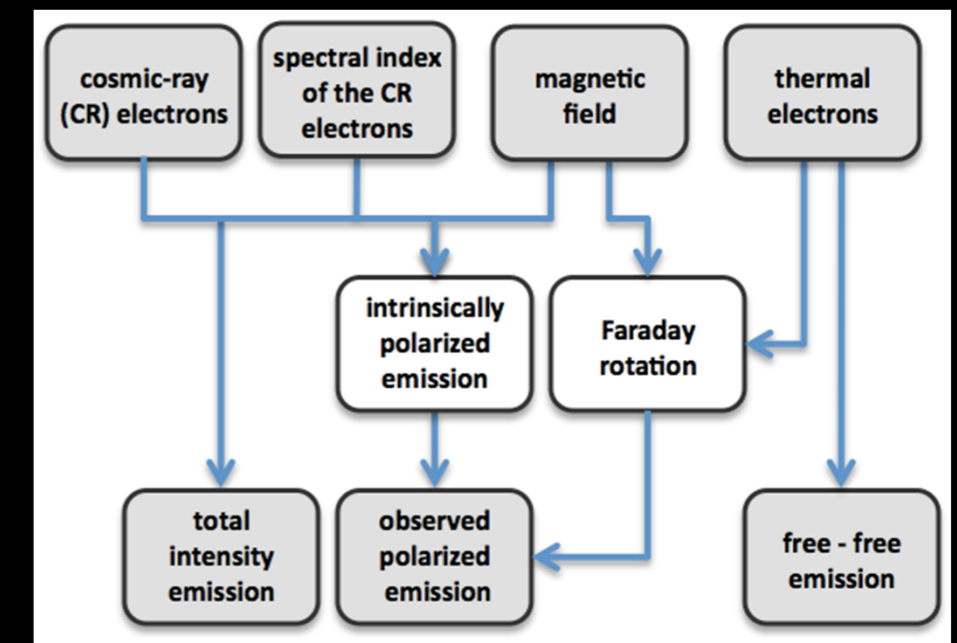


Vibor Jelić on behalf of the LOFAR-EoR team
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SIMULATIONS OF GALACTIC EMISSION

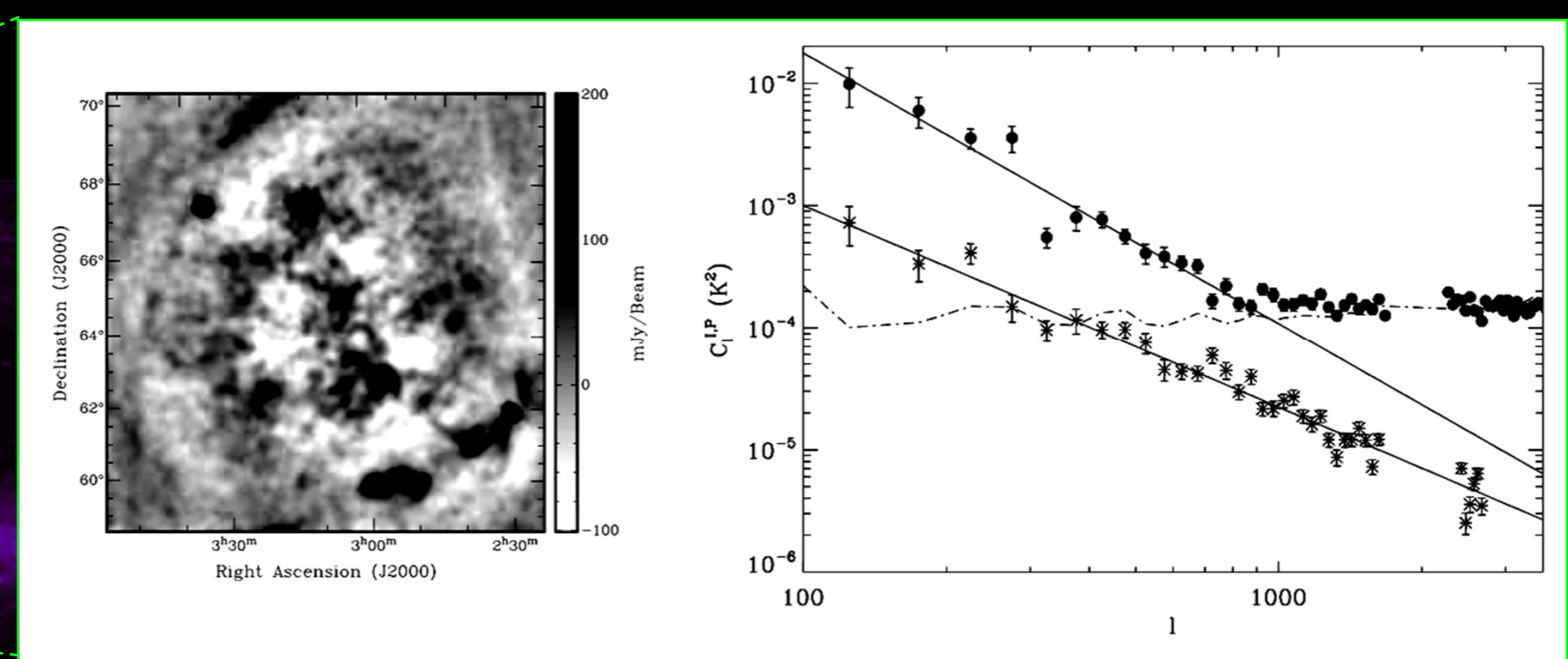
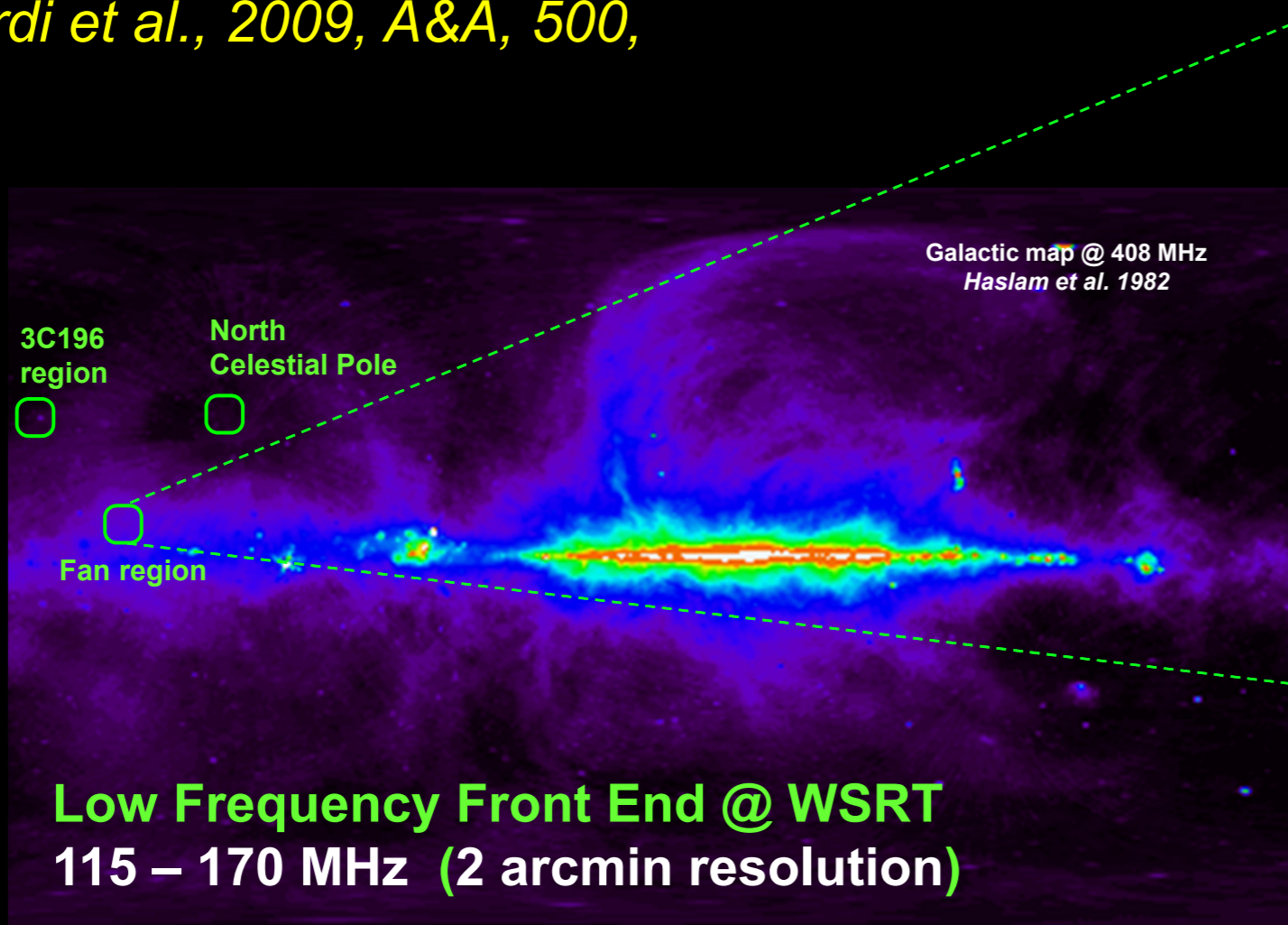
Jelić et al., 2010, MNRAS, 409, 1647
Jelić et al., 2008, MNRAS, 389, 1319

- $10^0 \times 10^0$ simulated maps of Galactic synchrotron and free-free emission derived from distribution of cosmic-rays and thermal electrons, and characteristics of Galactic magnetic field
- flexibility to simulate any peculiar case of Galactic emission including spatial variations of brightness temperature and its spectral index, and very complex polarized structures produced by Faraday rotation and depolarization



OBSERVATIONS OF GALACTIC EMISSION

Bernardi et al., 2010, A&A, 522A, 67B
Bernardi et al., 2009, A&A, 500, 965B



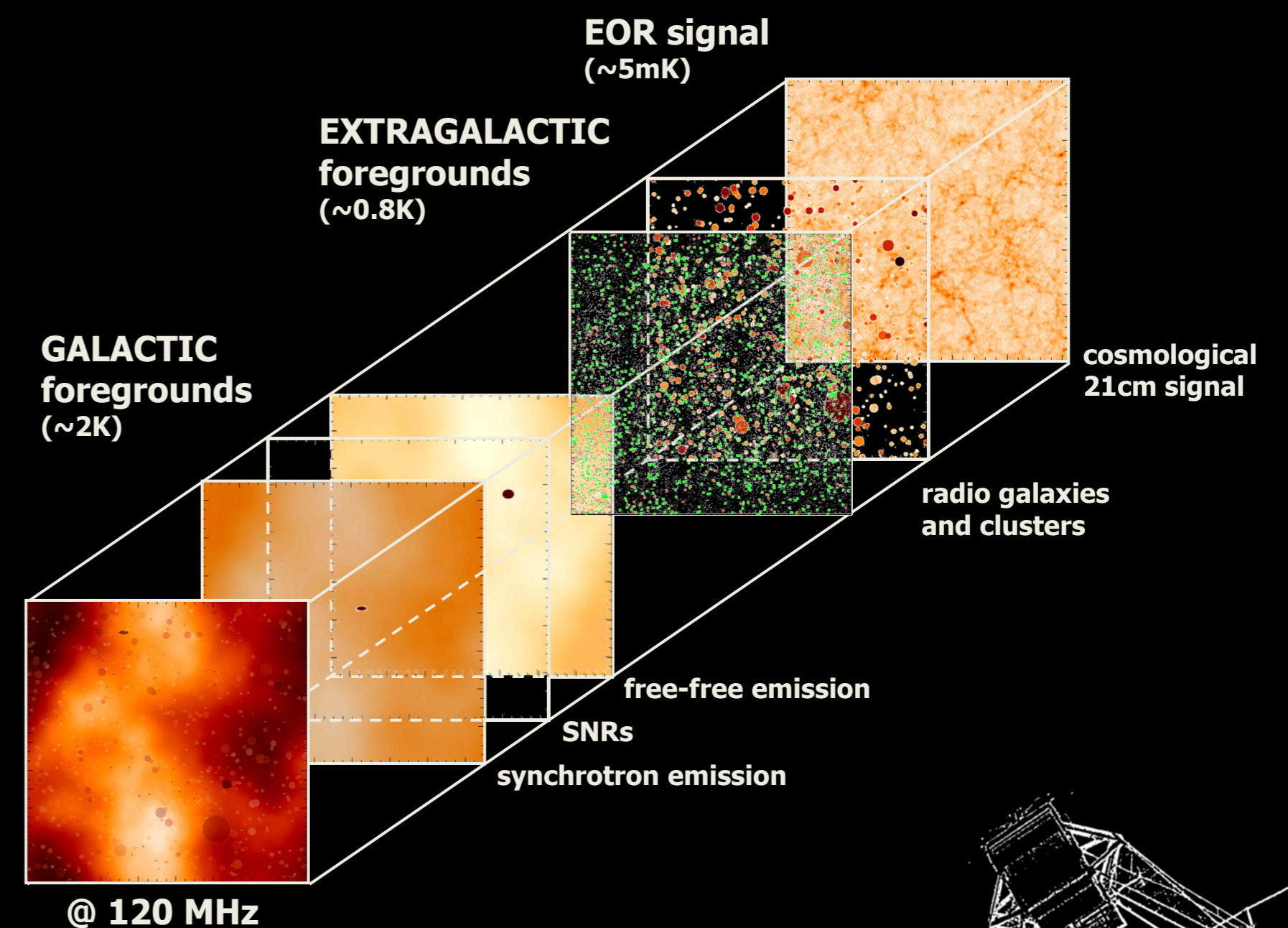
- total intensity emission lacks small-scale power (below the confusion noise level at angular resolution of 2 arcmin)
- polarization, given its relative weakness and its small rotation measure values, is less severe foreground component than expected

LOFAR-EoR EXPERIMENT



- Shallow survey for EoR windows has been started (LOFAR-EoR commissioning observations)
 - North Celestial Pole region (S. Yattawatta et al.)
 - 3C196 region (P. Labropoulos et al.)
 - ELAIS N1 region (V. Jelic et al.)
- multi-frequency observations with LOFAR will constrain properties and characteristics of Galactic emission at low radio frequencies

- STUDY OF PHYSICS OF GALACTIC EMISSION
- A VALUABLE INFORMATION FOR THE FOREGROUND REMOVAL



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Low Frequency Array – Epoch of Reionization key science project