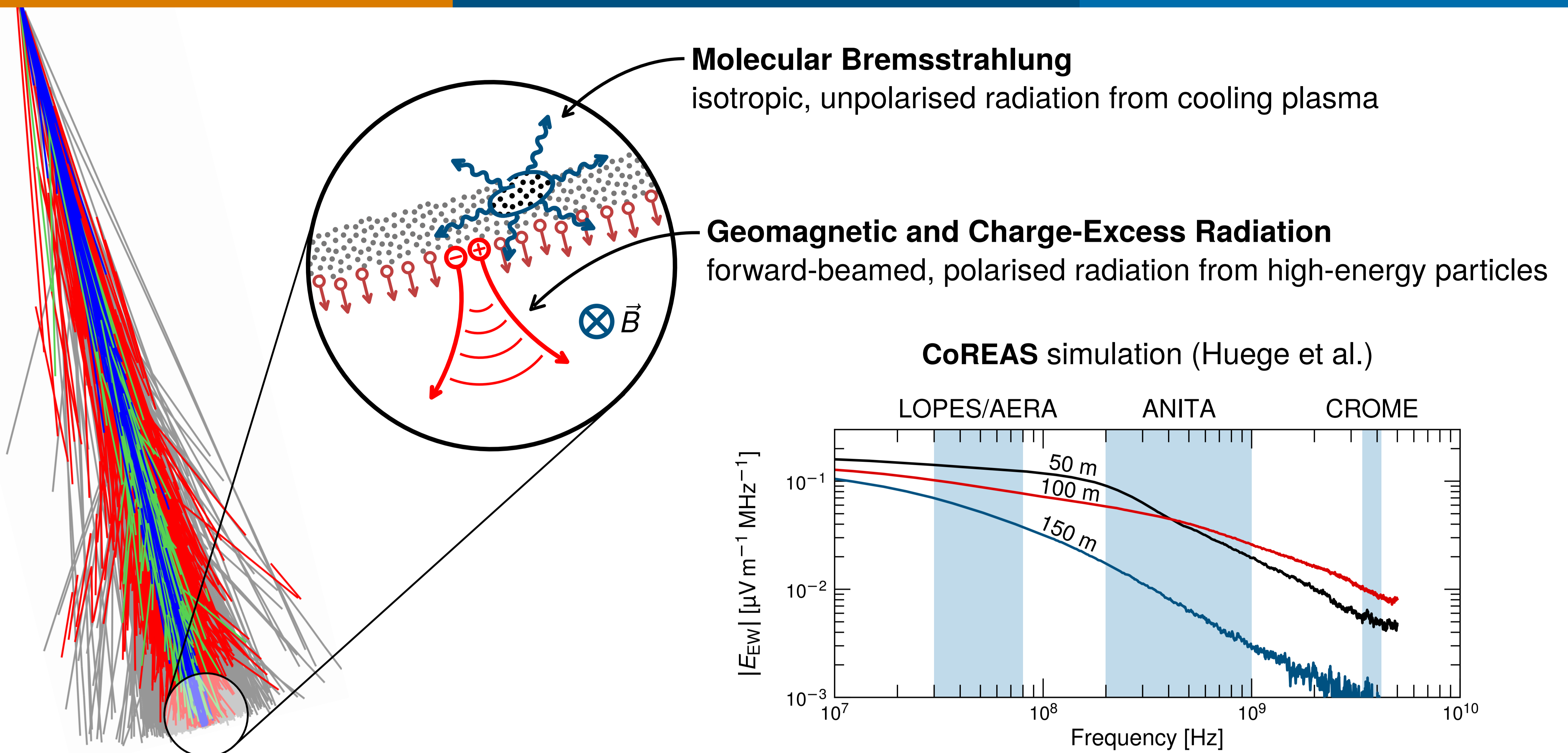


High-Frequency Radio Emission of Air Showers

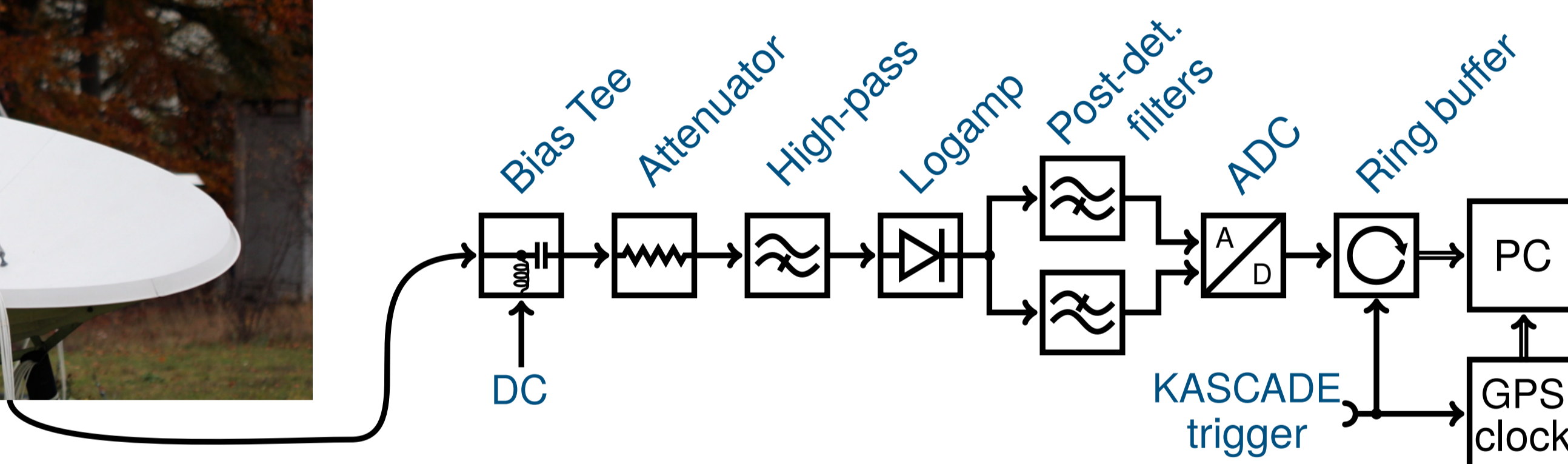
Felix Werner and Anne Zilles (KIT)



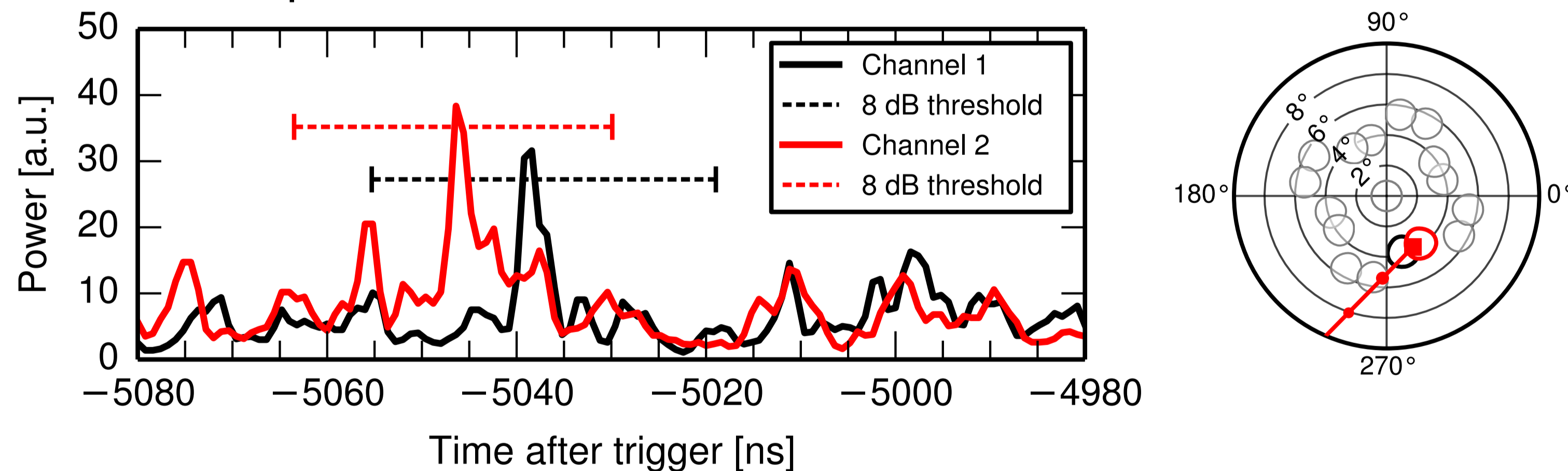
CROME Microwave Antenna Array within KASCADE-Grande



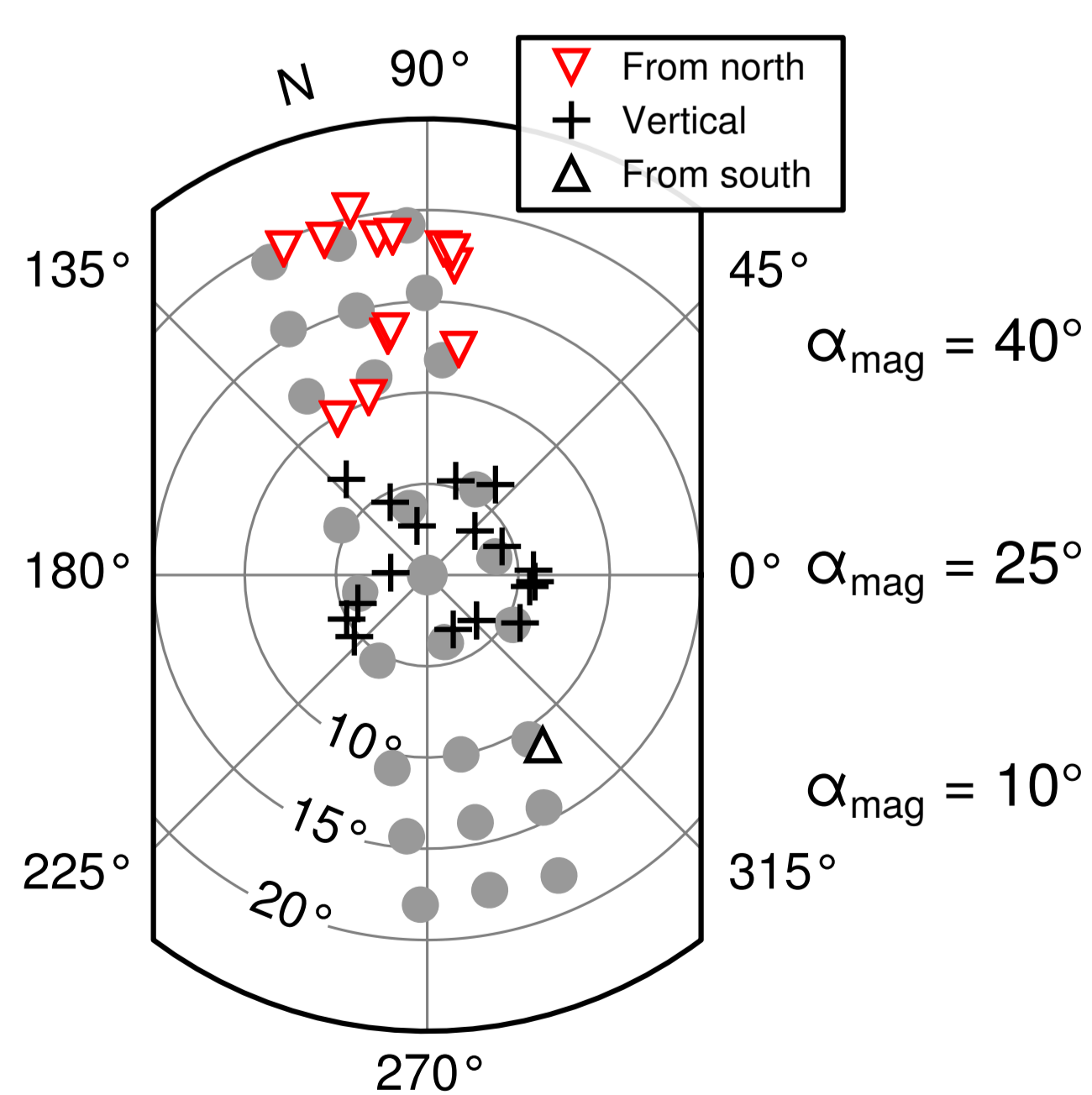
- 3.4 m parabolic reflectors within KASCADE
- 3×3 + 4 linearly polarised LNBS (3.4–4.2 GHz)
- Custom detection chain triggered by KASCADE



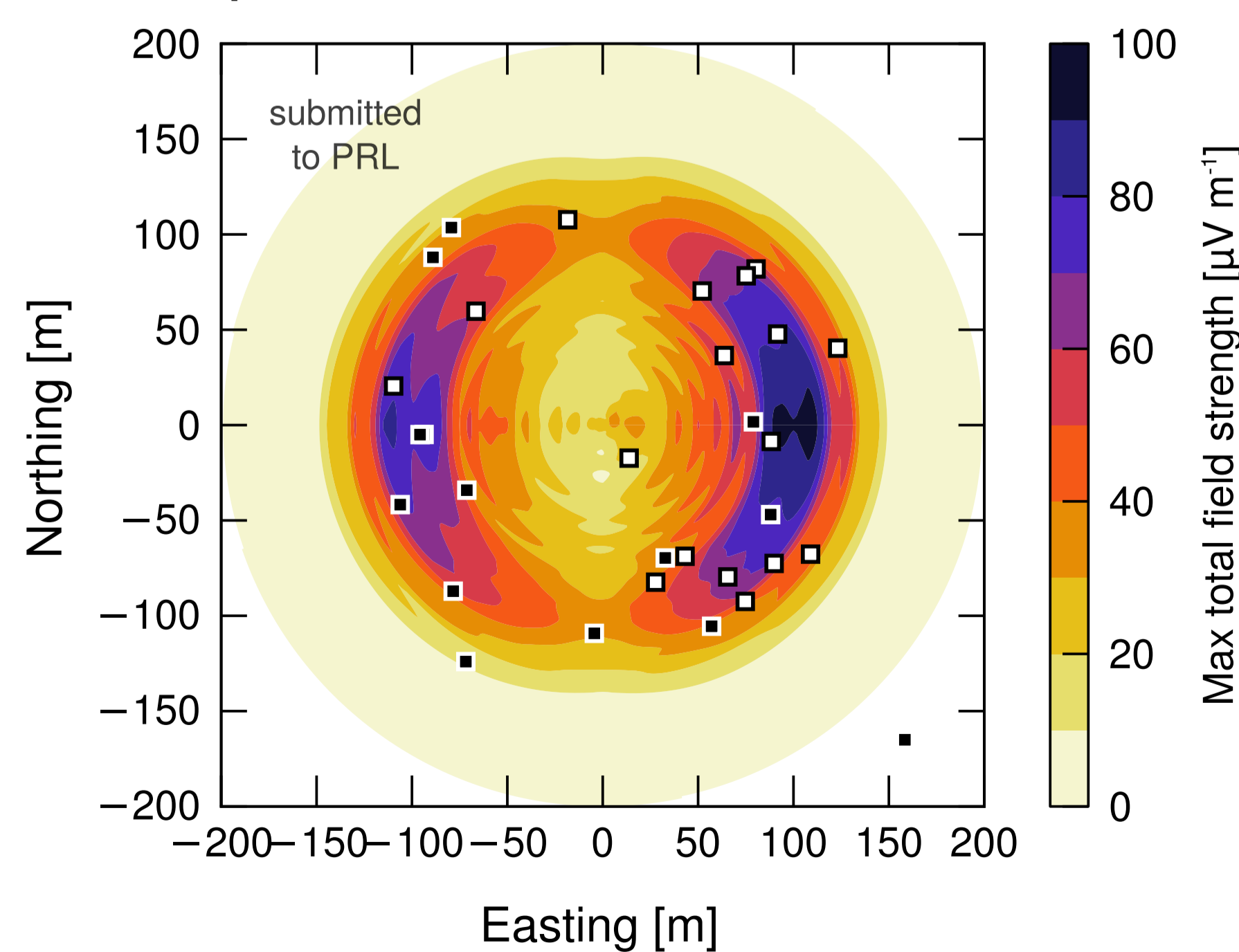
Example event—stereo observation of an air shower



Arrival directions of detected air showers

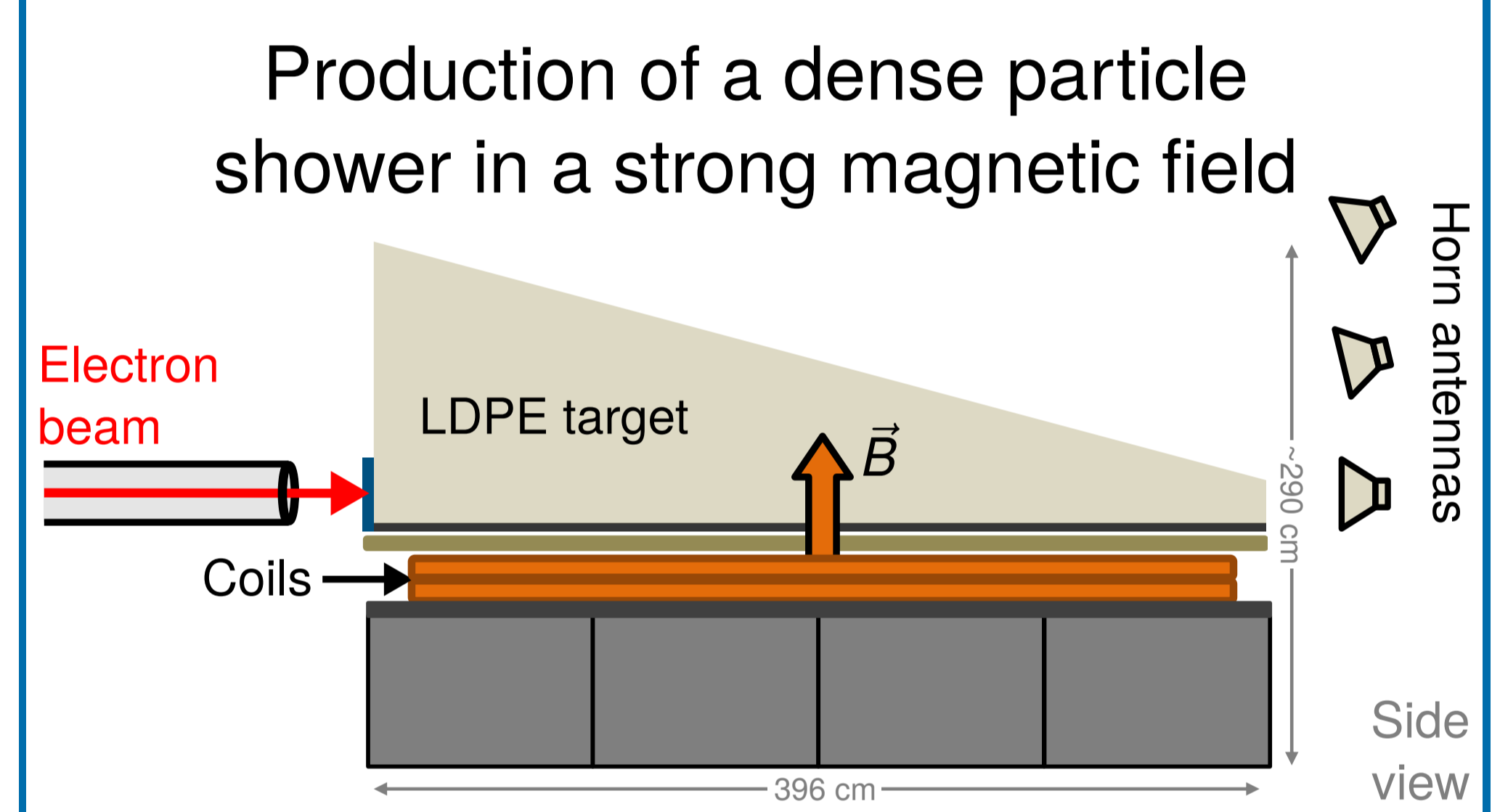


Measured core distribution compared with CoREAS simulation

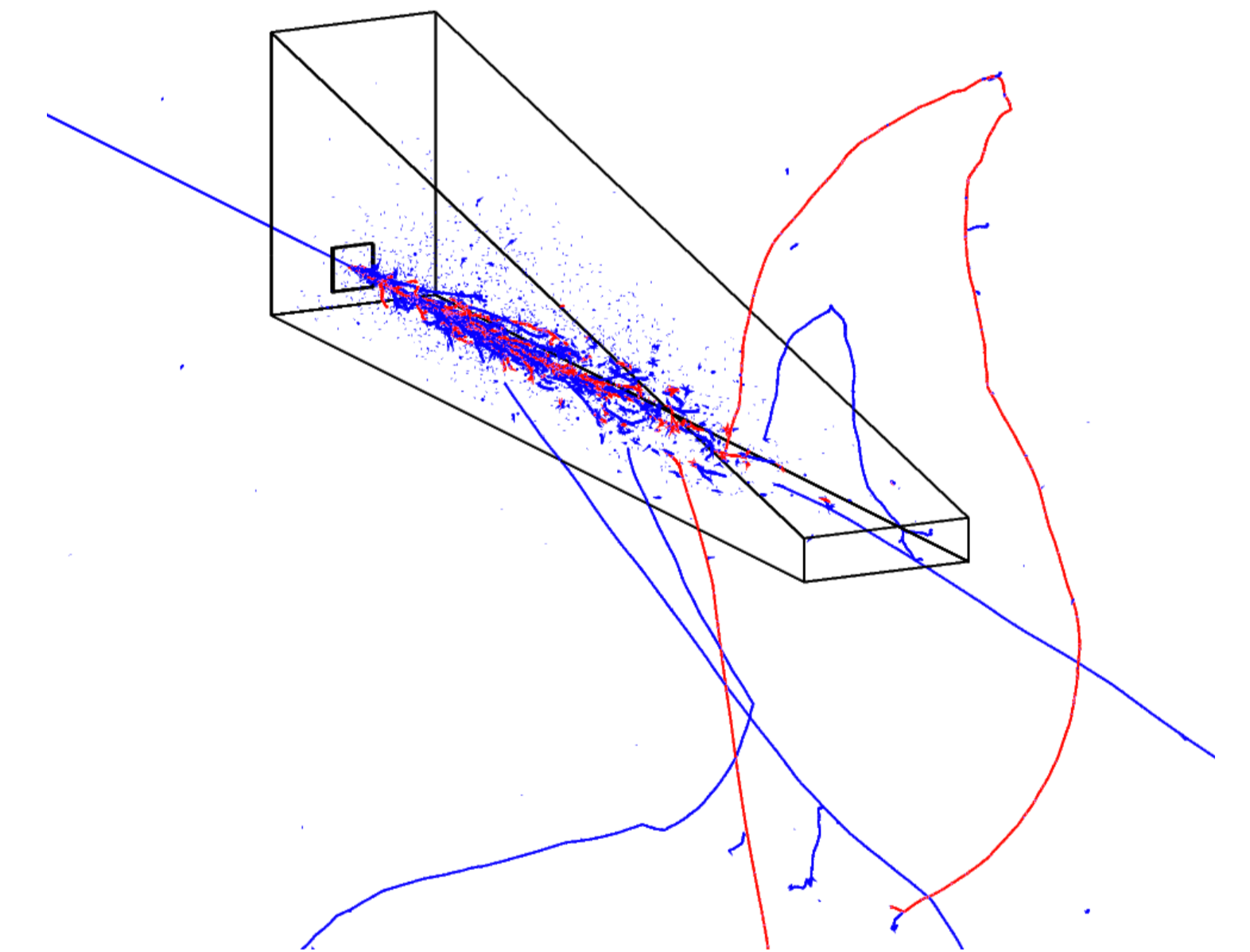


- Measurements are consistent with **geomagnetic and charge-excess radiation**
- Molecular bremsstrahlung is **disfavoured** as the dominant emission mechanism

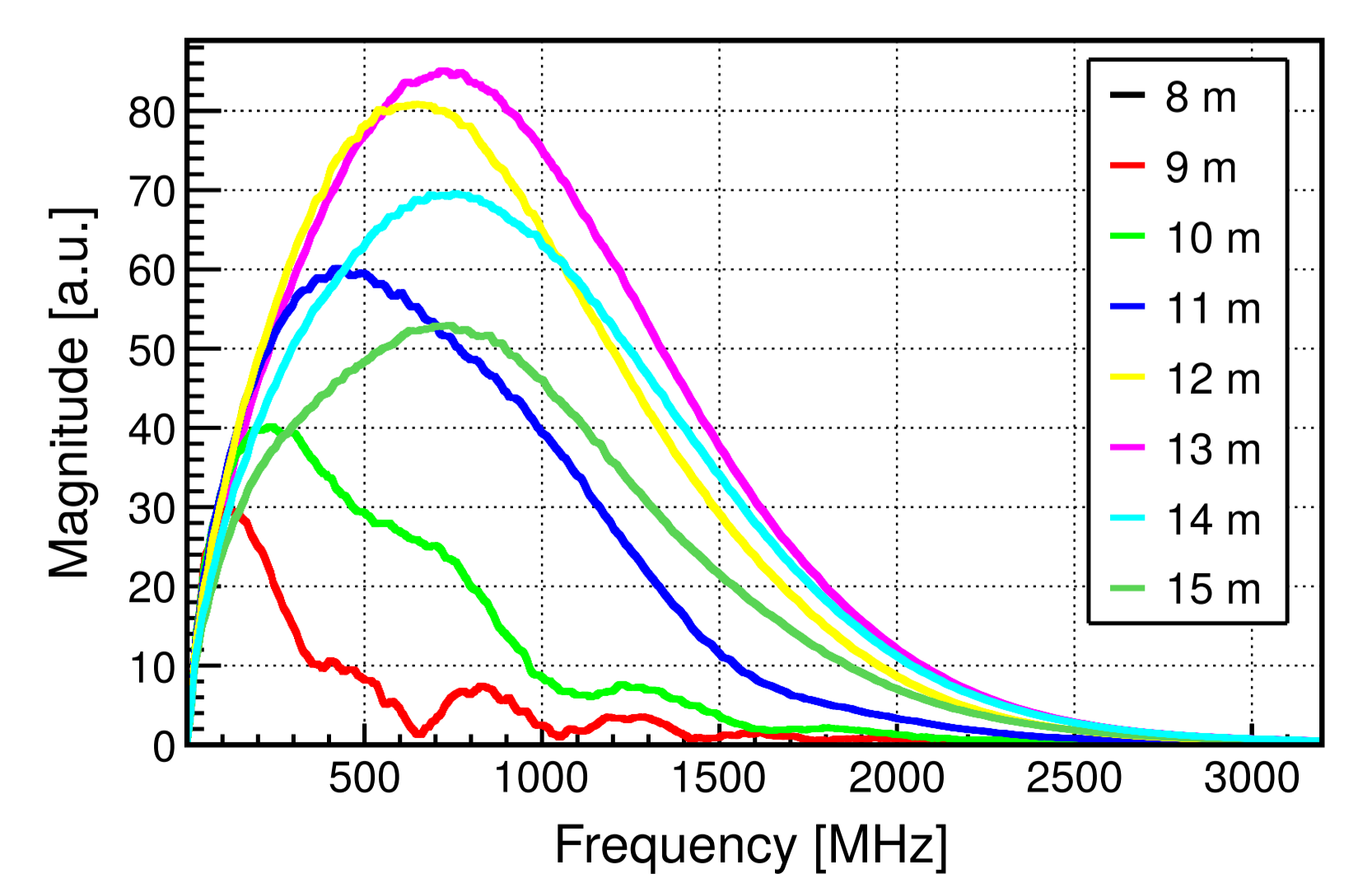
Laboratory Experiment SLAC T-510



Simulation of particle interactions with GEANT4



Simulation of radio emission with new extensions of GEANT4



- **Verifying the simulations** is crucial for coming analyses of radio measurements