

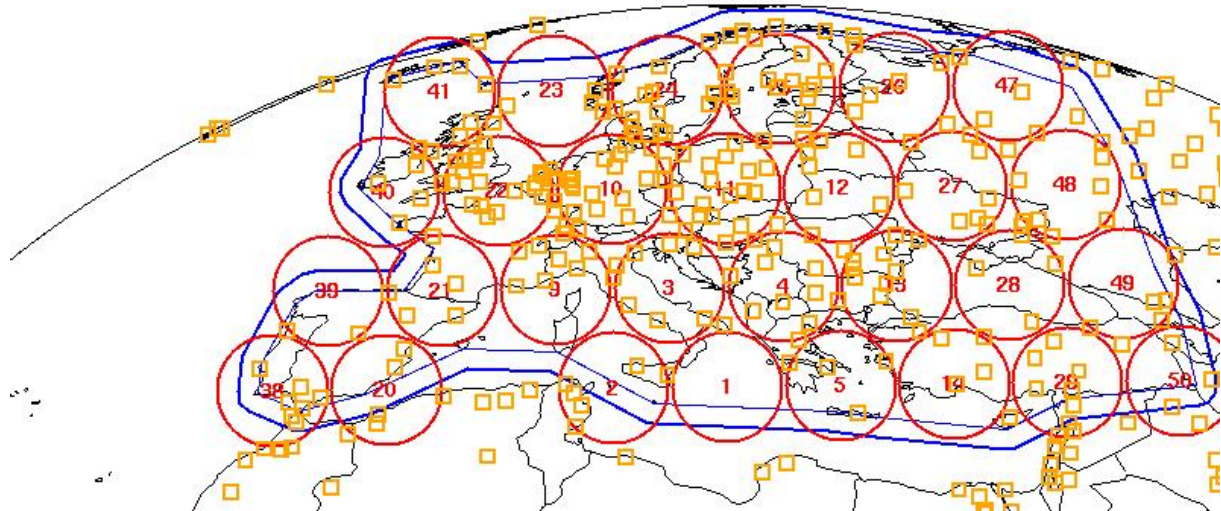


Proposed Technical Contributions to COST 284

Design and modeling software for broadband and multi-media satellite antenna systems. Review antenna concepts

D: 2.000 m f/D: 1.000 d: 34.8 mm APE: 0.150°

Beam: example



Current systems use mainly shaped reflectors (Ku band) and simple multiple beam antennas with one feed per beam (Ka band). Future systems will require more frequency reuses for higher capacity. Multi-beam coverages over Europe are more complex than over the Americas due to different language zones.

Large array-fed reflectors with beamforming networks will be required. The art of manufacturing waveguide networks has been lost and must be rediscovered. Other beamforming technologies will be required.

- Tcl/MCAD multi-beam satellite antenna system design tool based upon Tcl/Tk (UNIX and Windows) developed under COST 260. Other tools are Antenna Design Framework (IDS), CPLAN or Satsoft (Ken Sherman) and COBRAW (Ticra)
- Optimization of rectangular waveguide feed array layouts. Different coverages for transmit and receive.
- Extend mutual coupling software based on MSA theory with more accurate self admittance/impedance terms. Software developed under COST 235 and 245. In MSA theory, the normalized self admittance/impedance is 1. Extend by adding power stored in reactive near fields and coupling between waveguide modes in horn flares by mode matching. Other mutual coupling software base upon mode-matching available (CSIRO, Univ. of Bremen, Ticra etc.)