



TICRA's SW Tools for Radio Astronomy Applications

C. Cappellin, T. Rubæk, M. Zhou, P. Meincke
TICRA, Copenhagen, Denmark, e-mail: cc@ticra.com

TICRA has for five decades developed state-of-the-art antenna design and analysis software for satellite antenna designers and manufacturers, space agencies, Earth station suppliers, defence organisations and research institutions. TICRA's software products are trusted worldwide as fast and accurate design tools.

In particular, GRASP is the industry standard for reflector antenna design and analysis. The software provides the versatility needed by the antenna engineer to model the radiation from a reflector system, accounting for imperfections such as surface errors, support struts, panels misalignment, gravity effect and more.

CHAMP 3D is a software tool for the analysis and design of general passive multiport waveguide components and complex feed chains. Moreover, CHAMP 3D is the tool of choice for the design of horn and reflector antenna terminals with rotational symmetry for space, satcom and radio astronomy.

QUPES is a dedicated software tool for the analysis and design of quasi-periodic surfaces such as reflectarrays, frequency selective surfaces (FSS) and transmitarrays. Starting from the definition and design of the unit cell geometry to the optimisation of the entire finite-sized structures, QUPES provides the needed capabilities to design an FSS or dichroic mirror in a single tool, avoiding the need of multiple software packages.

The software products above work seamlessly together in the common TICRA Tools framework, with the advantage of offering the same user experience whether you are using the program for reflector antennas, feeds and waveguides or FSSs.

At the conference, we will present an overview of the most important contributions provided by TICRA for recent radio telescopes, like the Atacama Large Millimeter Array (ALMA), the Sardinia Radio Telescope (SRT) and the ESA's Deep Space Antennas (DSAs), highlighting the modelling performed by TICRA and the used analysis methods.