



“Some EMC issues in Radio Astronomy”

by Dr Franz Schlagenhauser
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Abstract: Radio astronomy is concerned with measurement of faint electromagnetic signals. Radio telescopes are increasingly sensitive, due to improvement in receiver technology and signal processing. This also means that man-made noise has to be all but eliminated. The interference from third-party equipment can be reduced by placing radio telescopes in the middle of nowhere; an example is the Murchison region in Western Australia, the site for two existing state of the art radio telescopes, namely the Murchison Widefield Array (MWA) and the Australian SKA Pathfinder (ASKAP), and the future site for part of the Square Kilometre Array (SKA). That leaves the radio astronomers' own equipment, including the radio telescope itself, as potential source for trouble. Very careful design with respect to RF emission is therefore essential. In the past the typical approach was to build a radio telescope, experience interference problems, and then fix these problems. Most modern radio telescopes are antenna arrays, with a large number of antennas, receivers, correlators etc. A trial and error approach is not longer economical, but emission limits from individual components must be specified and verified before they are assembled on site. The derivation of these limit values, and the emission measurement to verify compliance can be a challenge. This talk will cover some of the EMC issues related to the the Murchison Radioastronomy Observatory (MRO).

Biography

Franz Schlagenhauser studied Electric Engineering at the Technical University Munich, and was awarded the PhD degree from the Technical University Hamburg-Harburg in 1994. He was manager of an EMC laboratory in Hamburg from 1992 until 1995, and Technical Manager of EMCSI Pty Ltd in Melbourne from 1996 until 1999. He was Senior Research Fellow at The University of Western Australia, Perth from 2000 until 2009, where his topics of interest were computer simulation of PCBs and shielding enclosures. From 2010 until 2017 he was Research Engineer with the International Centre for Radio Astronomy Research (ICRAR) at Curtin University, Perth, an institute heavily involved in the SKA project. His tasks included EMC measurements in the lab and on-site, training and education. He also contributed to the development of EMC specifications for equipment to be placed on site, and was involved in several national and international conferences as chair and technical chair. He is a senior IEEE member, served as distinguished lecturer for the IEEE EMC Society in 2007/2008, and enjoys traveling around Australia.