

INNOVUS

CONTACT

OFFICE: +27 (21) 808 3826
 FAX: +27 (21) 808 3913
 EMAIL: info@innovus.co.za

Multi-mode Composite Antenna

Innovus Technology Transfer (PTY) Ltd is Stellenbosch University's wholly-owned technology transfer company. Contact Anita Nel, Innovus Chief Executive Officer, on (021) 808 3826 or send an email to ajnel@sun.ac.za for more information.



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Hemispherical coverage with reduced power
 gain variation and improved polarisation
 discrimination capabilities



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BRIEF DESCRIPTION

In wireless antenna applications it is desirable to receive and transmit signals from a wide variety of possible angles, yet standard antenna elements rarely offer this type of performance and are never completely omnidirectional.

Researchers at Stellenbosch University have developed a new antenna design that achieves near **hemispherical coverage with reduced power gain variation and improved polarisation discrimination capabilities** when compared to conventional dual-polarised dipole antennas.

UNIQUE CHARACTERISTICS

- Composite antenna with **accurate collocation**
- Very wide **Field-of-View**
- Excitation by a **single multi-modal** transmission line
- Improved **polarisation capabilities** and coverage

TARGET MARKET

- Designers of low- and mid-frequency RF scanning antennas
- Designers of multiple access node wireless networks at high frequencies
- Manufacturers of Radio Astronomy Devices

Our new antenna achieves almost hemispherical coverage and can be applied in a multitude of applications.

VALUE PROPOSITION/BENEFITS

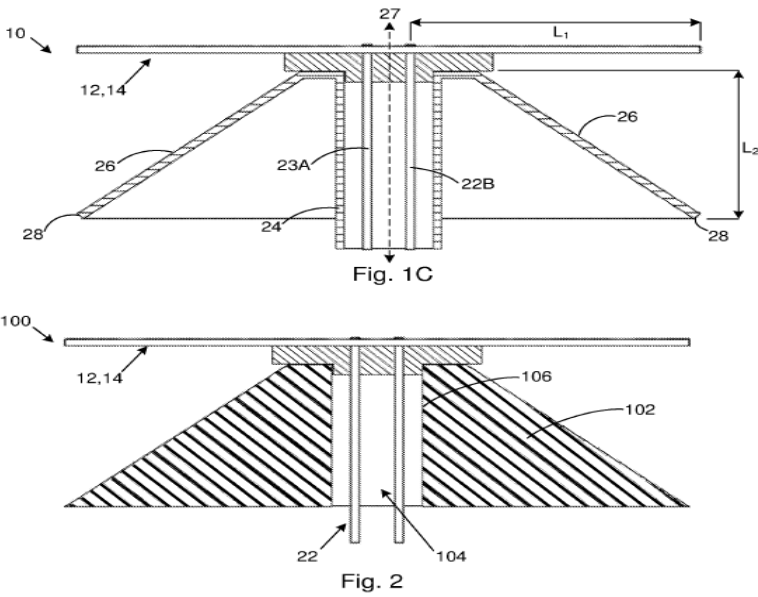
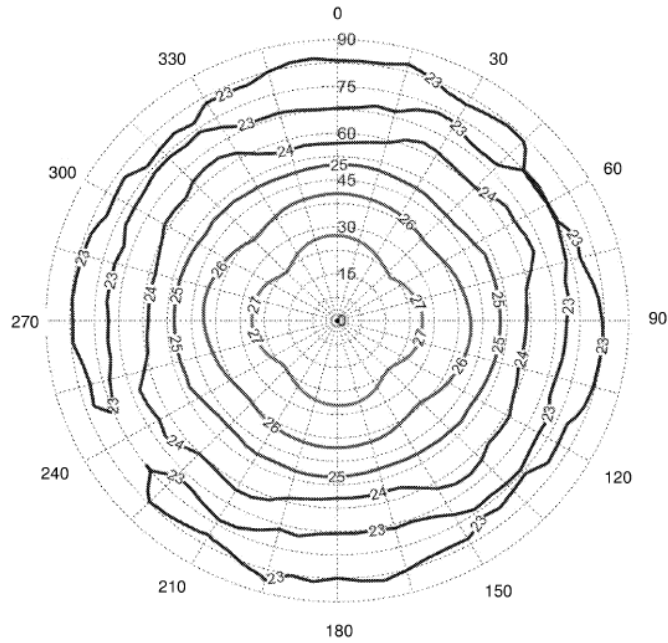
The proposed antenna element can function as a **radiating element for antenna arrays** in applications where a physically fixed system must electronically scan the whole of space above the horizon for signals. Alternatively, such an antenna can be mounted with arbitrary physical orientation, as determined by available surfaces, and have the **gain maximised in any required direction**. In a MIMO configuration the ability of the antenna to receive signals from antennas scattered geographically extends beyond that of standard antenna elements.

The antenna can be integrated into micro Base Transceiver Stations (BTS) for wireless communication networks or as a 4-port Multiple-In-Multiple-Out (MIMO) antenna, both in Line-of-Sight (LOS) and Rich Isotropic Multipath (RIMP) environments.

TECHNICAL DESCRIPTION

The invention combines co-located monopole and crossed dipole antennas to enable transmission to any direction within a full hemisphere.

By utilizing weighted combinations of four different modes of excitation, a radiation pattern is obtained which contains no nulls, and only a small variation of gain within a hemisphere extending down to the horizon.



PRINCIPAL RESEARCHERS

D.S.V. Prinsloo, PhD student at Stellenbosch University

Prof P. Meyer, Professor of Electric and Electronic Engineering at Stellenbosch University

Prof R. Maaskant, Assistant Professor at Chalmers University of Technology (Gothenburg, Sweden)

Prof M.V. Ivashina, Associate Professor at Chalmers University of Technology (Gothenburg, Sweden)

INNOVATION STATUS

Two patents applications have been filed for this technology. The first patent has been granted in China, South Africa and United States (US9490542). National phase have been entered into for the second patent application (PCT/IB2015/056762).

Prototypes of the multi-mode composite antenna have been designed, built and tested.