Kamp-Lintfort, 31st May 2007

Innovative ideas from Germany

SANTANA – Smart Antenna Terminal for Satellite Communications

Kamp-Lintfort, Hamburg: IMST and the Technical University of Hamburg-Harburg have presented a prototype of an electronically steerable antenna based on digital beamforming suited for satellite communication. This highly innovative system addresses applications in the area of mobile satellite communication, for example between planes and satellites (internet-in-the-sky), without the use of any mechanically moving parts. The project with the acronym SANTANA is supported by the DLR (German Space Agency) in the framework of the national funding programmes.

Within the research project SANTANA (Smart ANTenna termiNAl), a technology baseline has been defined for a fully operationable full-duplex satellite terminal antenna. The long-term goal of this R&D activity is the development of electronically steerable antenna systems where the pointing of the antenna beam towards the satellite is realised on a digital level. This highly flexible approach is based on a modular concept where each module contains 16 antenna elements, transmit or receive electronics respectively included. This allows a cost-effective and flexible realisation that easily can be adapted for various antenna applications.

On 31st May 2007, a first demonstrator based on 4 modules (64 antenna elements in total) has been presented to the press and public at the premises of IMST in Kamp-Lintfort. The degree of miniaturisation is not yet very high but the system shows already all the benefits of beam pointing on a digital level. Also, the SANTANA concept has been verified in a flight experiment.

Background Information:

Mobile satellite links at higher frequencies usually require mechanically steerable antennas in order to point the antenna beam towards the satellite. Alternatively, electronically steerable antennas can be used. The German Space Agency DLR in Bonn, supports the SANTANA project with national funds since 2003. This challenge is tackled by a consortium, all leading edge companies and institutes in their own field of expertise in Germany: the Technical University of Hamburg-Harburg, IMST, EADS Astrium and DLR Oberpfaffenhofen. The possibility of beam pointing on digital level allows variable and broad banded data links between moving platforms (planes) on one side and stationary platforms (satellites) on the other side. The expected data rates are comparable to those of DSL services. The innovative antenna design of SANTANA is well suited for integration in the hull of planes.

For more Information on the SANTANA project please visit www.dlr.de or www.smart-antennas.de.

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