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Telecom		 <p>ESA develops new modulation patent for DVB-S2</p> <p>24 Jan 2007</p> <p>A team of engineers at the European Space Agency have proposed and patented a new way of optimising digital data modulation for high spectral efficient transmission over satellite channels. The approach has been retained for the new DVB-S2 standard for broadcasting, interactive and professional services.</p>			Related Links
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New to Telecom?		<p>The Intellectual Property Rights (IPR) holders of key DVB-S2 (Digital Video Broadcasting - Satellite), namely ESA, DirectTV Group and RAI (Radiotelevisione Italiana), have reached agreement on licensing. This agreement, which was announced just before Christmas, could mean a speedier adoption of the DVB-S2 standard. DVBS-2 is the second generation DVB system for broadband communications and covers a host of new innovations such as, digital TV, HDTV broadcasting, interactive services and professional links by satellite.</p> <p><i>"It's extremely satisfying that our effort has found rapid application in the commercial world", stated Dr Riccardo de Gaudenzi, head of the team that came up with the invention. "Our work began internally at ESA/ESTEC even before the DVB-S2 standard was started. I would like to thank my two ex-colleagues, Mr Albert Guilen and Mr Alfonso Martinez for their invaluable support in the concept development and verification."</i></p> <p>The US patent, which was finally approved on 17 October 2006, is called 'Coded Digital Modulation Method for Communication System'. Essentially, the work ESA carried out involved a new way of designing highly spectral efficient modulations to make them better than conventional squared Quadrature Amplitude Modulations such as 16QAM and 32QAM over satellite channels. The work focused on constellation optimisation, nonlinear channel pre-compensation techniques and digital demodulator synchronisation. What this means is that it is now possible to achieve higher data rate over a given satellite transponder bandwidth. This combined with the near-Shannon DVB-S2 coding scheme makes commercial deployment of satellite broadband applications more attractive.</p> <p><i>"Our work on coded Amplitude and Phase Shift Keying (APSK) modulation, was well received by the DVB-S2 group, explained Dr De Gaudenzi, "The group then rapidly decided to include 16 APSK and 32 APSK as part of the DVB-S2 standard, in addition to more conventional QPSK and 8PSK modulations."</i></p> <p>The optimised APSK modulation proposed by ESA outperforms QAM modulation over satellite nonlinear channels allowing close to saturation operation of the on-board high power amplifiers. <i>"The concept of circular APSK modulation was already proposed 30 years ago but it was concluded that for single carrier operation over nonlinear channel APSK performs worse than PSK schemes. Our work has been altered that view. We've also shown that APSK modems for satellite channels can be easily implemented", concluded Dr Gaudenzi.</i></p>			RAI DirectTV Press Release
Already a contractor?					<p>If you would like to read more about APSK non-linear modulation, please click on the links at the right of this page.</p> <p style="text-align: center;"><i>teaser image of DirectTV's Spaceway F2 satellite courtesy Boeing other image Dr Riccardo Gaudenzi</i></p>
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