

Invited paper

**Low Cost Transparent Radio-over-Fibre System for
UWB Based Home Network**

A. Pizzinat, I. Louriki, B. Charbonnier, F. Payoux, S. Meyer (1), M. Terré, C. Algani, A-L. Billabert, J-L. Polleux (2),
C. Sillans (3), H. Jaquinot, S. Bories (4), Y. Le Guennec (5), G. Froc (6)

1: France Telecom R&D, 2 Av. P. Marzin, Lannion (France), anna.pizzinat@orange-ftgroup.com

2: CNAM and ESIEE-ESYCOM, Paris (France) 3: IFOTEC, Voiron (France) 4: CEA-LETI, Grenoble (France),

5: IMEP-MINATEC-INPG, Grenoble (France), 6: Mitsubishi-Electric, Rennes (France)

Abstract

We show for the first time the feasibility of a multipoint to multipoint architecture for the distribution of ultra wide band radio signals over multimode fibre with low cost components.

Extended Abstract

In a few years home networks will have to work at speeds of 1Gbit/s following the deployment of fibre to the home and to satisfy the explosion of broadband services. Moreover, wireless connectivity is required by users to connect multiple multimedia devices inside the home. New radio technologies as ultra wideband (UWB) are able to provide high bit-rates, but with coverage limited to some metres, thus Radio over Fibre (RoF) systems become of interest to extend the UWB coverage.

We present the results of the French BILBAO project that investigates architectures and low cost solutions for a home UWB based network on multimode fibre. We introduce different RoF architectures as point-to-point, point-to-multipoint and multipoint-to-multipoint with their main advantages and disadvantages. We then present the dimensioning of the UWB over fibre access node by means of link gain and noise figure calculations. According to these requirements, high gain antennas and low noise variable gain amplifiers have been realised during the project. The access node integrates low cost VCSELs and photodiodes typically used for digital communications. Finally, we report experimental results that prove the feasibility of deploying very high bit-rate UWB based wireless home networks using an optical transparent architecture.



Anna Pizzinat

Anna Pizzinat graduated with honors in 1999 and obtained the Ph.D. degree in 2003 in Electronics and Telecommunications engineering at University of Padova, Italy.

From 2003 to 2005 she was at the Photonics and Electromagnetic Group at University of Padova (Italy) working on polarization mode dispersion and 40 Gbit/s systems. In 2006 she joined France Telecom R&D where she is currently engaged in research on the next generation optical home and access networks with a focus on radio over fibre systems.

She is author of more than 50 scientific papers on international journals and conferences, and 2 international patents.