

## Recueil des Résumés JDT'2015

### **3ème Journée Doctorale en Télécommunications** **«JDT'2015», 16 Novembre 2015, Guelma, ALGERIE**

Abde Rezzaq HALASSI et Rachid HAMDI  
«A new Synthesis Approach for a Reconfigurable birefringent Filter»

#### Abstract

In this paper, we present a novel procedure for the synthesis of a hybrid liquid-crystal birefringent filter (HLCBF) having arbitrarily amplitude transmittance. The synthesis procedure is based on the resolution of a generalized nonlinear equation system directly deduced from a Jones matrix formulation. A typical example of a 6-stage HLCBF having an arbitrarily non-symmetric amplitude transmittance is shown and the opto-geometrical parameters are given to demonstrate the efficiency of the proposed synthesis procedure.

HADJADJI Narimane et HAMDI Rachid  
«Study of Coherent Optical Transmission System at bitrate of 112 Gbit/s»

#### Abstract

In this paper, we analyzed the transmission performance of 112 Gbps polarisation division multiplexed (PDM) system for Quadrature Phase Shift Keying (QPSK) modulation formats for 3 channels with 100 GHz channel spacing. This coherent system has been analyzed for using Constant Modulus Amplitude (CMA) in order to find its influence when add the polarization scrambling. Results and analysis of the system are also presented.

The performance characteristics of the system are compared through simulation at 28 Gbaud before and after using CMA, we can see the quality factor (Q) of Optical Signal Noise Ratio (OSNR) equal to 14 is 7.93 dB for the signal with CMA and decrease to 2.65 dB for the signal with a polarization rotation without using CMA. So there is a penalty of 5.28 dB and the signal is totally lost, but after using the CMA algorithm that signal is recovered.

Finally, one important factor of using CMA algorithm is the signal degradation at the receiver owing to fluctuations of light state of polarization (SOP) provoked by the fiber.

**BOUCHENE Mohammed Mehdi et HAMDY Rachid**  
**«Study of Fabry-Pérot laser oscillation field spectrum using Traveling Wave Model(TWM)»**

**Abstract**

We present a time-domain traveling wave model (TDTWM) for the simulation of Fabry-Pérot laser output spectrum. We present examples of simulation of the spectrum for different drive current and facets reflectivity. The output spectrum found by the TDTWM shows an excellent agreement with the spectrum obtained by rate equations for below and at threshold current, and prediction of the effect of longitudinal spatial hole burning (LSHB) above threshold current.

**Soulef AYAD et Salah REDADAA**  
**« Gaussian Range-Doppler Algorithm for SAR Imaging»**

**Abstract**

High resolution of targets, fine quality of image, reduction the computation and the power consumption of transmitter signal are four elements of radar systems attracted considerable interest at the number searchers of SAR focusing systems. To get this need, different modulation have been developed and used to perfect the quality of image like Linear Frequency Modulation (LFM). In this paper, we investigate new radar waveforms that are used to improve the resolution of targets named Gaussian linear frequency modulation (GLFM). Preliminary simulations are performed and discussed.

**Sarra MEKHANCHA, Somia BOUSAHA, et Ahcene BOUALLEG**  
**«Le Système de Transmission MIMO-OFDM»**

**Résumé**

Les canaux à trajets multiples dégradent les performances des systèmes de communication radio. Néanmoins les travaux menés sur ces canaux durant les deux dernières décennies ont montré que les canaux à trajets multiples peuvent offrir de plus grands débits en utilisant des récepteurs adéquats, capables d'exploiter leurs propriétés. Ces récepteurs peuvent utiliser plusieurs techniques dont les techniques OFDM basées sur le multiplexage spatial.

**MEKIRCHA Khadidja, ABED Djamel et REDADAA Salah**  
**«Performance of MIMO-OFDM System using STBC Code for M-QAM, M-PSK»**

**Abstract:**

In this paper, we are interested by MIMO (multiple input multiple output) with the context OFDM, a general space-time block code (STBC) structure is proposed for MIMO One important problem arises in case of MIMO system is, how to code across space and time to obtain the maximum output (minimum BER). For AWGN, Rayleigh and Rician Fading Channel fading channels, modulation M-PSK and M-QAM, STBC is a recent breakthrough solution to this problem. Analysis will be done for an OFDM wireless communication system by using STBC, and considering the effect and the wireless channel fading. The expression for Bit Error Rate will be developed for different input SNR.

**«Modulations Multiporteuses à Base de Bancs de Filtre (FBMC) pour les Communications sans fil Haut Débit »**

**Abstract:**

Among all the multicarrier modulations (MCM), the most widespread modulation is the orthogonal frequency division multiplexing (OFDM) for its simplicity and its robustness against multipath fading using the cyclic prefix (CP). Nevertheless, this technique causes a loss of spectral efficiency due to the CP, and his spectrum which is not compact due to the high sidelobes resulting from the rectangular pulse. To attempt these drawbacks, filter-bank multicarrier (FBMC) was presented as an interesting alternative approach to OFDM. OFDM/OQAM model (also referred as OFDM/Offset QAM) is the most common FBMC principle considered in the literature, since it does not require the use of CP, and consequently, its spectral efficiency is optimal. The main idea in FBMC/OQAM is to transmit offset QAM symbols (introducing a shift of half the symbol period between the in-phase and quadrature components) instead of conventional QAM symbols, this lead to restrict the orthogonality in the real field. At the receiver side we can recover the transmitted data which is carried by the real (or imaginary) components of the signal, and the imaginary (or real) parts appear as interference terms. A scheme of combination of FBMC and MIMO-System is presented, and also, his combination with Alamouti coding scheme (STBC). Some figures of simulation illustrate and confirm the importance of the presented model.

**Aissa ATTOUI et Ahcene BOUALLEG**

**«A Novel Resonator Antenna Phased Array with Liquid Crystal Based Phase Shifters»**

**Abstract**

This work presents for the first time a combination of liquid crystal phase shifter technology and dielectric resonator antenna, in an array configuration. The electromagnetic energy is coupled into the rectangular dielectric resonator from the slots in the ground plane which is then radiated from the top face of the dielectric resonator antennas. Here we present a new external command of Phase Shifter. The structure is composed of a three parts of liquid crystal placed between ground plane and the line.