



SEMINAIRE EXCEPTIONNEL

de 13 h à 14 h, salle Belledonne, IMEP-LAHC, MINATEC,
(ouvert à tous : enseignants, étudiants, chercheurs, administratifs, techniciens)

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“MEMS a promising technology for tunable mm-wave circuits”

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Abstract: Microelectromechanical systems (MEMS) used for RF applications have shown to be a viable solutions for tunable circuits applications. However, at microwave frequencies, the complex encapsulation and reliability issues related to MEMS result in a disadvantage when compared to CMOS technology, even if they show better performance in terms of linearity, insertion loss and power handling, when compared to MOS varactors and switches. As the frequency increases in the mmW mm-wave frequency range, the quality factor of the semiconductor tuning elements decrease drastically and MEMS become an interesting alternative, especially because the well-known reliability issues are being resolved. This seminar will propose an overview of MEMS-based tuning elements as well as circuits that are being developed using MEMS for mmW mm-wave applications. In particular, a distributed approach based on the use of slow-wave transmission lines will be described.

Gustavo Rehder is 35 years old. He received his PhD degree from the University of São Paulo (Brazil) in 2008. In 2010, he was Post Doctoral researcher at the IMEP-LaHC and since 2013 he is Associate Professor at the University of São Paulo. He authored or co-authored 13 publications in peer reviewed international journals and is author or co-author of 35 communications at international conferences with peer reviewed process and proceedings as well as 3 patents.

Main publications or patents:

- A.-L. Franc, et al., “**Compact and Broadband mm-Wave Electrically Tunable Phase Shifter Combining Slow-Wave Effect with Liquid Crystal Technology**,” *IEEE Trans. on Microwave Theory Tech.*, vol. 61, no. 11, pp. 3905-3915, Nov. 2013.
- A. L. C. Serrano, et al., “**Modeling and Characterization of Slow-Wave Microstrip Lines on Metallic-Nanowire-Filled-Membrane Substrate**,” *IEEE Trans. on Microwave Theory Tech.*, vol. 62, no. 12, pp. 3249-3254, Dec. 2014.
- A. L. C. Serrano, et al., “**Slow-wave radiofrequency propagation line**”, patent no. US20150070110 A1, publication date Mar 12, 2015.
- G. Rehder, et al., “**Development of a slow-wave MEMS phase shifter on CMOS technology for millimeter wave frequencies**”. *Microelectronic Engineering.* , v.90, p.19 - 22, 2012.
- G. Rehder et al. “**Ligne de transmission haute fréquence**” patent no. WO/2012/032269, publication date Sept 29, 2011.

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