平成 26 年 7 月 25 日

各位、

東北大学電気通信研究所
ブロードバンド工学研究部門
超ブロードバンド信号処理研究分野　教授
尾辻　泰一

第 72 回ナノ・スピン工学研究会・通研講演会の開催について

拝啓、時下ますますご清祥のこととお喜び申し上げます。
さて、下記の通り第 72 回ナノ・スピン工学研究会・通研講演会を開催致しますので、
皆様多数ご参集下さいますようご案内申し上げます。

敬具、

記

東北大学
通研講演会
第 72 回ナノ・スピン工学研究会
－テラヘルツプラズモンデバイスとそのイメージング応用－

日時： 2014 年 7 月 30 日(水) 15:00－17:00
場所： 東北大学　電気通信研究所　ナノ・スピン研究棟　4 階　A401 室
〒980-8577　仙台市青葉区片平２－１－１
言語： 英語
講師： **Prof. Dr. Yahya M. MEZIANI**
Dept. of Applied Physics & Electronics, University at Salamanca, Spain

プログラム：

15:00 – 16:00 **"Plasma wave transistor for terahertz imaging"**
We report on non-resonant (broadband) and resonant detection of terahertz radiation using strained-Si modulation doped field effect transistors. The devices were excited at room temperature by two types of terahertz sources (an electronic source based on frequency multipliers at 0.292 THz and a pulsed para- metric laser at 1.5 THz). In both cases, a non-resonant response with maxima around the threshold volt- age was observed. Shubnikov-de Haas and photoresponse measurements were performed simultaneously and showed a phase-shift of pi/2 in good agreement with the theory, which demonstrates that the observed response is related to the plasma waves oscillation in the channel. The non-resonant features were used to demonstrate the capabilities of such devices in terahertz imaging. We also cooled our device down to 4.2 K to increase the quality factor and resonant detection was observed by using a tunable source of terahertz radiation.

16:10 – 17:00 **"Terahertz time domain spectroscopy"**
The terahertz time-domain spectroscopy (THz-TDS) is based on a Ti: Sapphire femtosecond laser and two low-temperature grown GaAs photoconductive antennas for emission and detection of THz radiation. A working window from 0.2 to 2.5 THz was obtained. The THz-TDS is a powerful tool to characterise the free carrier response of graphene and probe the inter- and intra-band response of excited carriers with sub-ps time resolution. First, spectral response of water vapour absorption is reported and compared to HITRAN database. A good agreement was observed. Finally, the THz spectra of different graphene layers have been measured showing higher transmission at terahertz frequencies for mono layer graphene.

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