

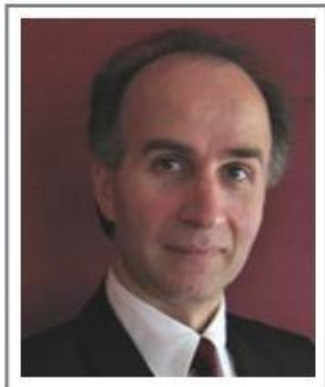
# IEEE中華民國分會補助各支會活動成果報告表

96.5.3

會議名稱：<專題演講> A 300-GHz Fundamental Oscillator in 65-nm CMOS Technology		
舉辦日期：98/9/22		
主辦機構：IEEE SSCS Taipei Chapter 、交通大學電子系、瑞昱半導體		舉辦地點：交通大學
舉辦支會：SSC37	支會主席：陳巍仁	TEL：03-5712121*54172
原預估出席人數：180人 會議當天實際出席人數：300人		
會議重要成果：（請確實填寫，作為下屆補助經費參考） 此專題演講邀請加州大學洛杉磯分校教授Prof. Razavi蒞臨演講，介紹使用65奈米CMOS技術實現300GHz基礎震盪器，藉以提昇國內相關技術人才設計能力，促進國內產、學界保持與國際先進技術接觸。		
		
 		
需繳交資料：	1. 活動文章（約500字，MS-Word格式，中英文版各乙篇） 2. 照片2-4張（JPEG檔/300dpi） ※ 上述資料請自行登錄於分會網頁，並將電子檔e-mail至陳虹妙 ( <a href="mailto:nao@cc.nctu.edu.tw">nao@cc.nctu.edu.tw</a> )信箱。	

# 專題演講

## A 300-GHz Fundamental Oscillator in 65-nm CMOS Technology



**Prof. Behzad Razavi**

**University of California, Los Angeles**

### 主講人簡介

Behzad Razavi is a professor at UCLA. He has published seven books and received numerous awards for his research, writing, and teaching.

主辦單位

IEEE SSCS Taipei Chapter

交通大學電子系

瑞昱半導體



### 時間 地點

時間：98年 9月 22日 13:30~15:20

地點：交大工四館B1國際會議廳

~免費入場~

### 大綱

A common approach to generating high frequencies is to use "superharmonic" oscillators, i.e., to "sift" a higher harmonic by techniques such as edge combining or push-push action. "Fundamental" oscillators, on the other hand, operate at the first harmonic, offering two advantages: they demonstrate the existence of gain, and they provide differential and even quadrate outputs. These properties pave the way for the design of compact high-performance transceivers.

This presentation describes with a new fundamental oscillator topology that achieves a (first harmonic) frequency of 300 GHz, 50% higher than that of prior art in 45-nm CMOS technology. Using magnetic coupling between a differential pair and a cross-coupled core, the circuit tolerates greater passive and active device losses than do conventional oscillators. Three prototypes have been fabricated and tested using an on-chip mixer, achieving frequencies of 204 GHz, 240 GHz, and 300 GHz while consuming 3.5 mW. The results show remarkable agreement with simulations.