



"Dispozitive și sisteme pentru unde milimetrice: De la antene până la sisteme front-end optimizate pentru aplicații specifice"

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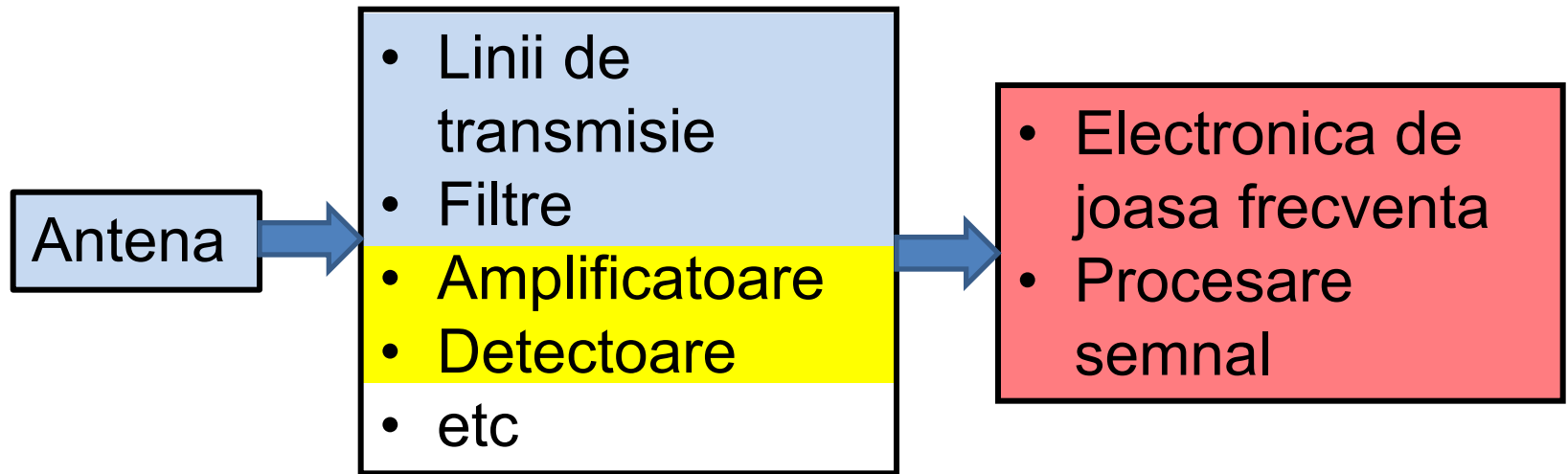
UNIUNEA EUROPEANĂ

Instrumente Structurale
2014-2020

Expertiza IMT in domeniu a fost demonstrata si in cadrul proiectelor:

- **MEMIS**-"MEMS Based Millimetrewave Imaging System", MNT ERA-NET (2010-2013), <http://www.imt.ro/memis/>
- **NANOTEC** - „Nanostructured materials and RF-MEMS RFIC/MMIC technologies for highly adaptive and reliable RF systems ", IP FP7-ICT-2011.3.2, 2011 – 2015, <http://project-nanotec.com/>
- **IDEI MI-4-SEMA** „Millimeter-wave Front-End for Imaging in Security and Medical Applications”, 2011-2016, <http://www.imt.ro/mi-4-sema/>
- **ENIAC SE2A** - “Nanoelectronics for Safe, Fuel Efficient and Environment Friendly Automotive Solution”, 2009-2011, <http://www.eniac-se2a.com/>
- **MEMS-4-MMIC** “Enabling MEMS-MMIC technology for cost-effective multifunctional RF-system integration”, STREP, FP7-ICT-2007-2, 2008-2013, <http://www.mems4mmic.com/>

Sistem frontend



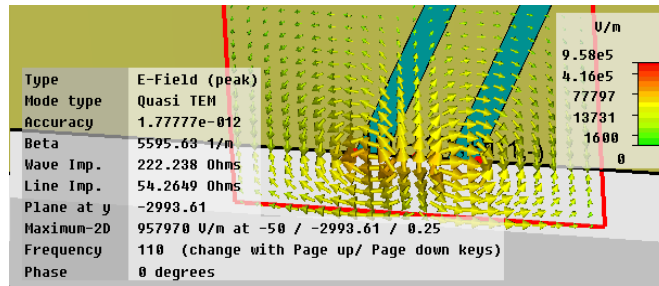
Expertiza IMT Bucuresti (modelare, proiectare, fabricare, caracterizare)

Realizate cu componente/circuite semiconductoare comerciale integrate hibrid

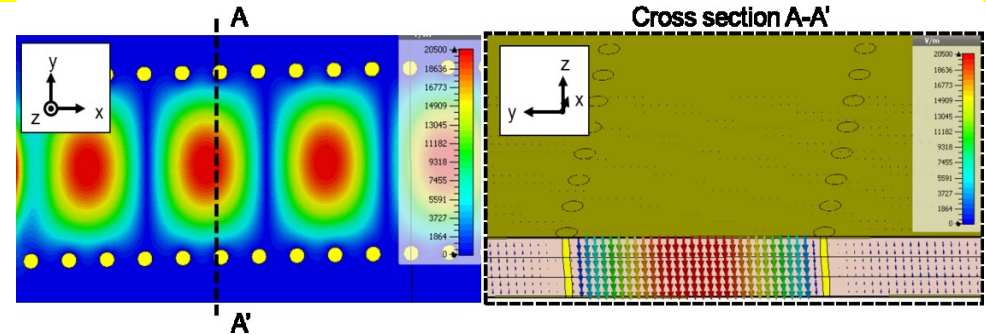
Urmeaza a fi implementate in cooperare cu partenerul industrial (inclusiv specificatiile de sistem)

Modelare electromagnetica avansata in gama 35 – 220 GHz (... 1.000 GHz)

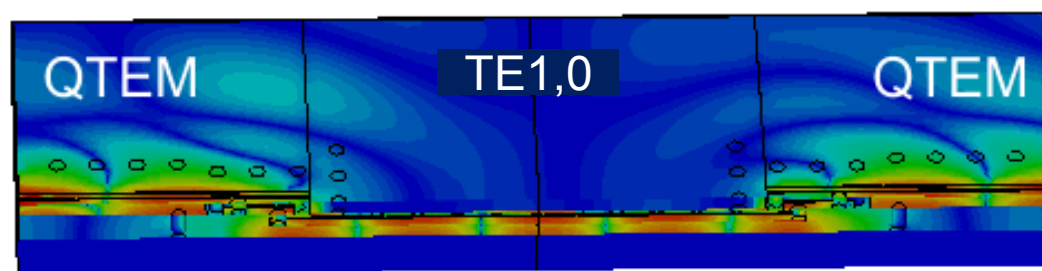
CST Microwave Studio, Comsol, HyperLynx Mentor, AWR Microwave Office



Ghid de unda coplanar (CPW)



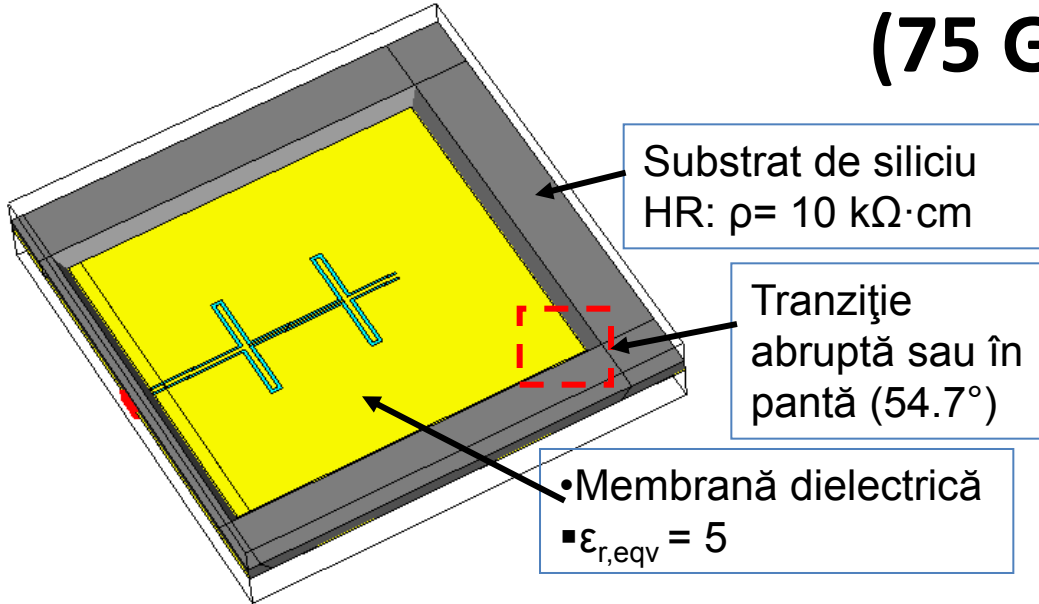
Ghid de unda integrat in substrat (SIW)



Distributia de camp electric: tranzitia CPW - SIW

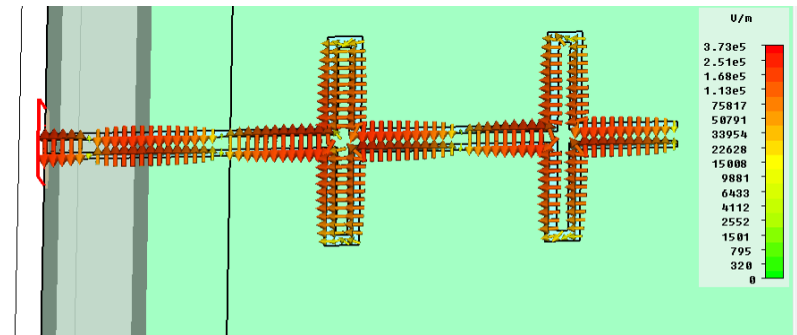
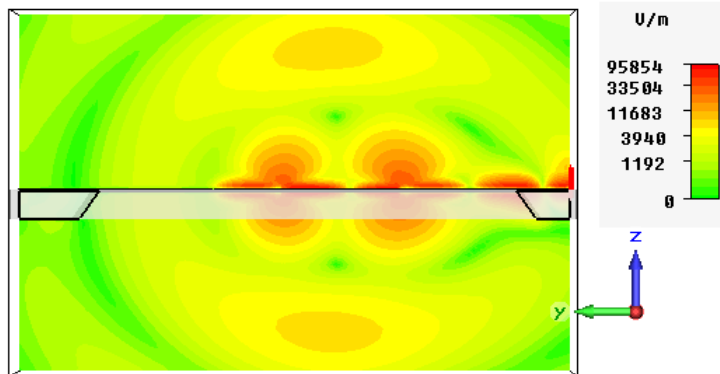


Antena microprelucrata pentru banda W (75 GHz – 110 GHz)



Model electromagnetic 3D

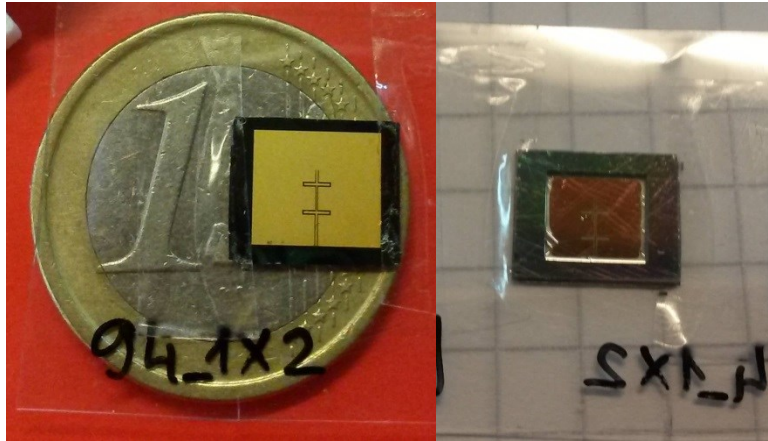
Mecanism de radiație – distribuția câmpului electric



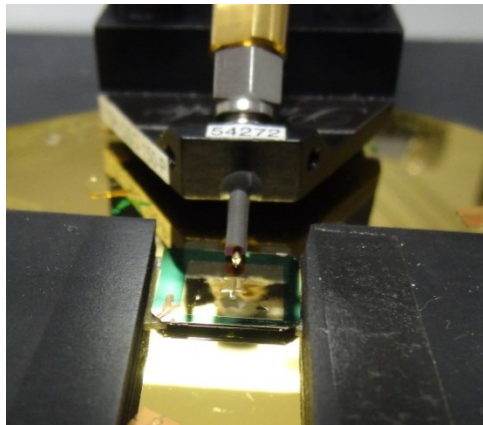
*A.C. Bunea et al., „Design and Characterization of a Micromachined Receiver for W Band Applications”, IEEE EuMW 2014



Antena microprelucrata pentru banda W (75 GHz – 110 GHz)

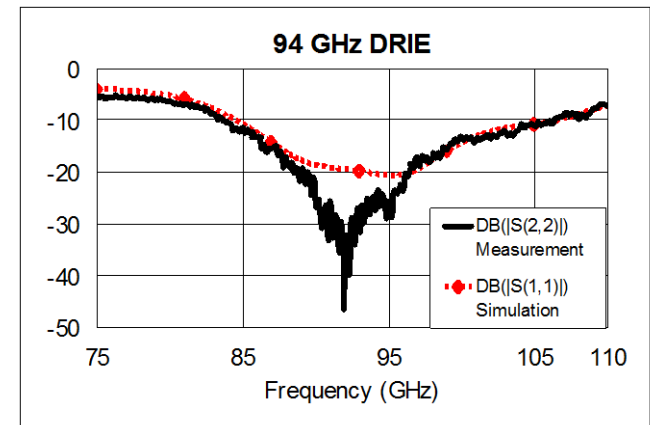


Detaliu al montajului experimental



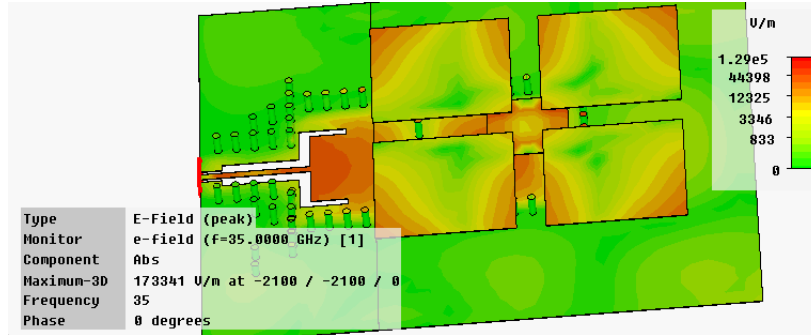
Structura de antena fabricata la IMT
(membrana 6.1 x 5.56 mm²)

Pierderi de reflexie

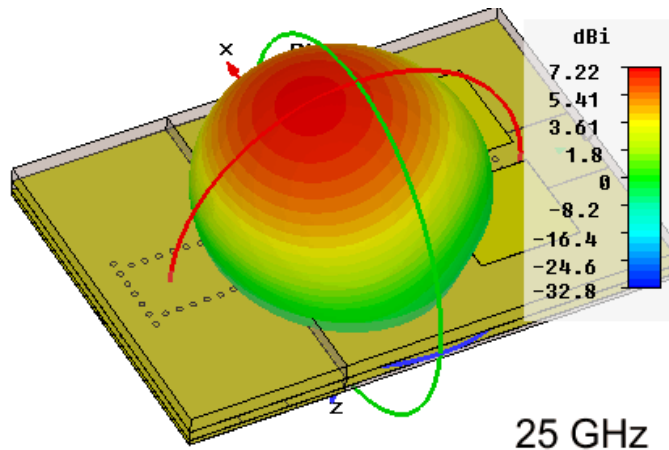
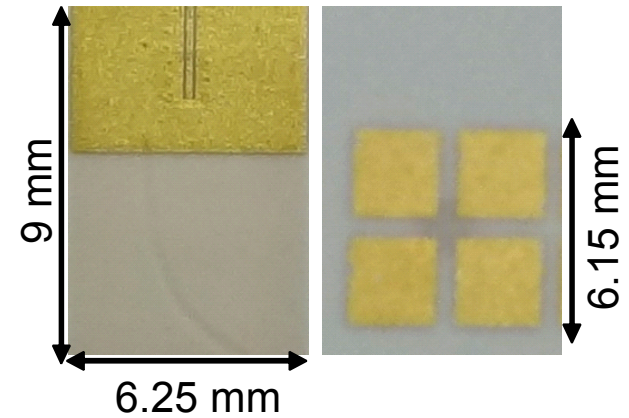


*D. Neculoiu et al., „Membrane Supported Circuits for Millimeter Wave Application”, IEEE CAS 2014

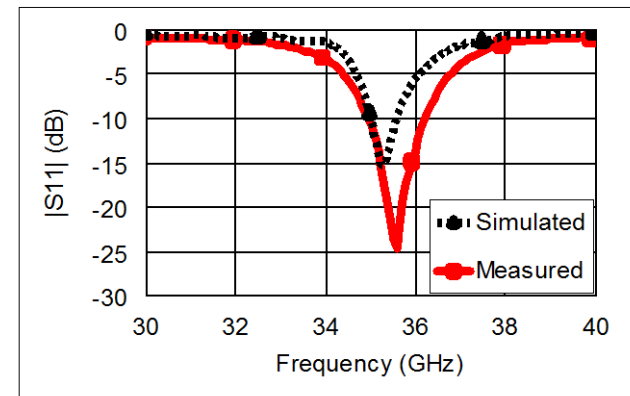
Antena LTCC pentru 35 GHz



Distributia de camp electric



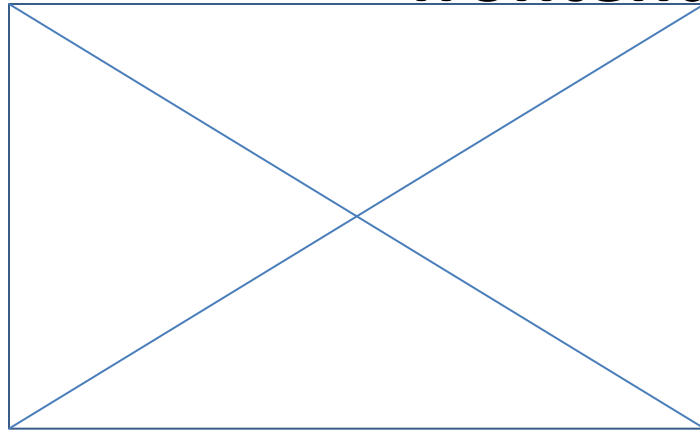
Caracteristica de radiatie



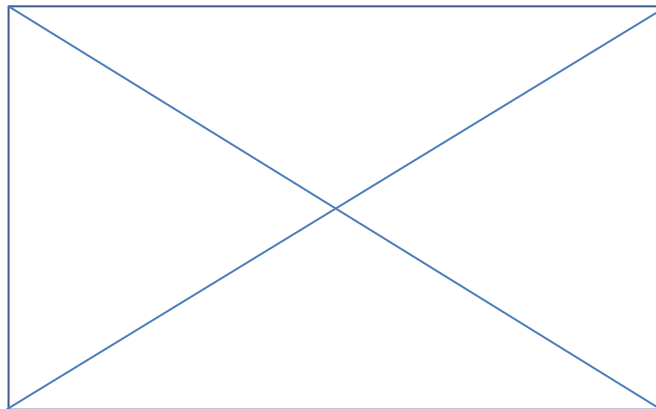
Pierderi de reflexie

*A.C. Bunea, et al., *Low Temperature Co-Fired Ceramic Antenna for 35 GHz Applications with a Wideband GCPW to Stripline Transition*, Romanian Journal Of Information Science And Technology, Vol. 17, no. 4, 2014

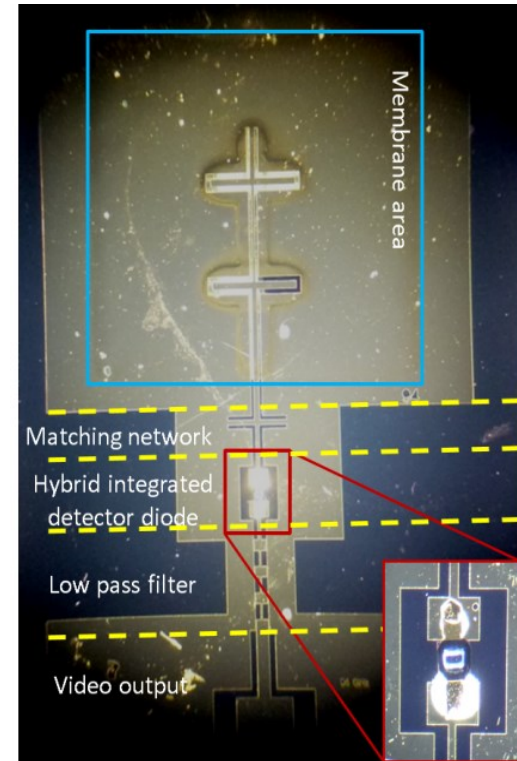
Proiectare si integrare hibrida sistem frontend de receptie



**Antena LTCC integrata hibrid cu dioda
detectoare**



**Antena integrata hibrid cu
LNA si dioda detectoare**



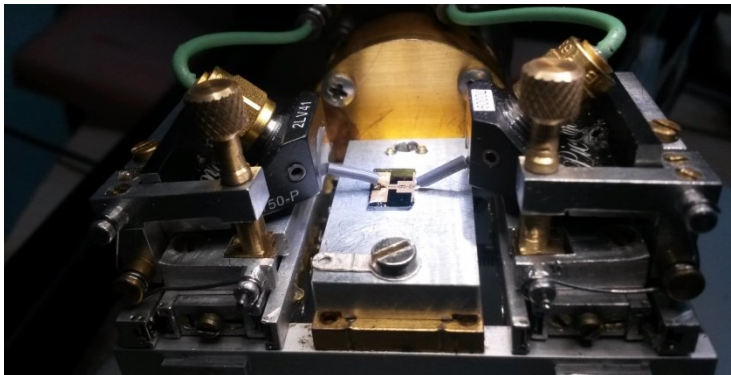
**Antena microprelucrata integrata
hibrid cu dioda detectoare**

*A.C. Bunea et al., „Design and Characterization of a Micromachined Receiver for W Band Applications”, IEEE EuMW 2014

Caracterizare experimentală

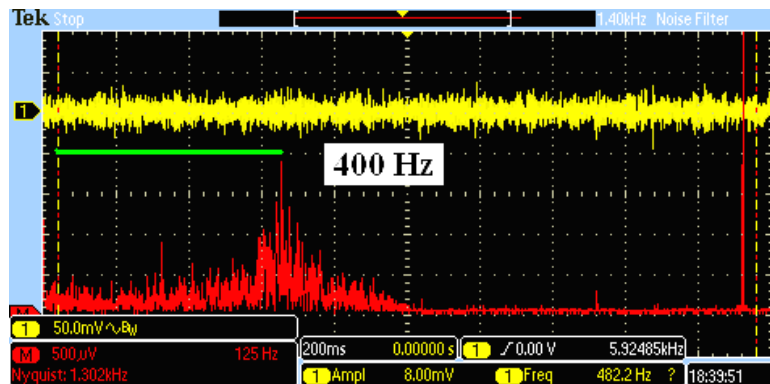
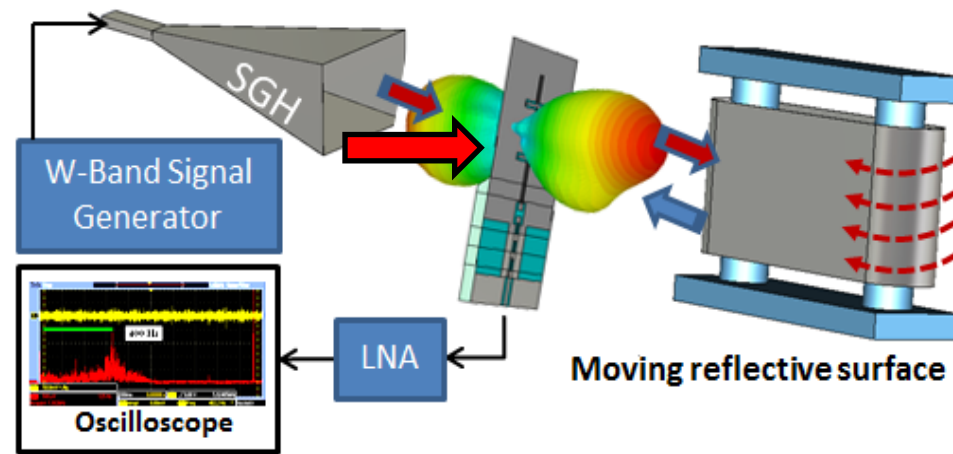


**Analizor Vectorial de Rețele
40 MHz – 110 GHz**



- masuratori de parametri S pe placheta utilizand standarde de calibrare SOLT
- sisteme experimentale dedicate
 - polarizare in curent continuu a dispozitivelor active
 - masurarea caracteristicilor de radiatie a antenelor in planele E si H
 - masurarea senzitivitatii receptoarelor pentru optimizarea performantelor lor in diferite aplicatii
 - Masuratori RF&DC la temperaturi criogenice
 - etc.
- Tehnici dedicate de extragere a parametrilor de model

Senzor Doppler pentru viteze reduse



Tape speed: 1.12 m/s

Doppler frequency: 400 Hz

Calculated speed: 1.1 m/s

*D. Neculoiu et al., „Ground Speed Doppler Sensor with a Micromachined Double Folded Slot Antenna”, IEEE APMC-2015



Persoane contact

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