



DISPOSITIVO PARA LA MEDICIÓN DE LA INTENSIDAD COMPLEJA DEL SONIDO

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UNIFE-CNR-UNdeC



15 de junio 2018 – Cooperazione Universitaria Argentina - Italia

MARCO INSTITUCIONAL



PhD Internacional +
futuros intercambios



PhD en Fisica
(Acustica)

Borsa di
studio



Convenios de
colaboración



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Laboratorio
de altura



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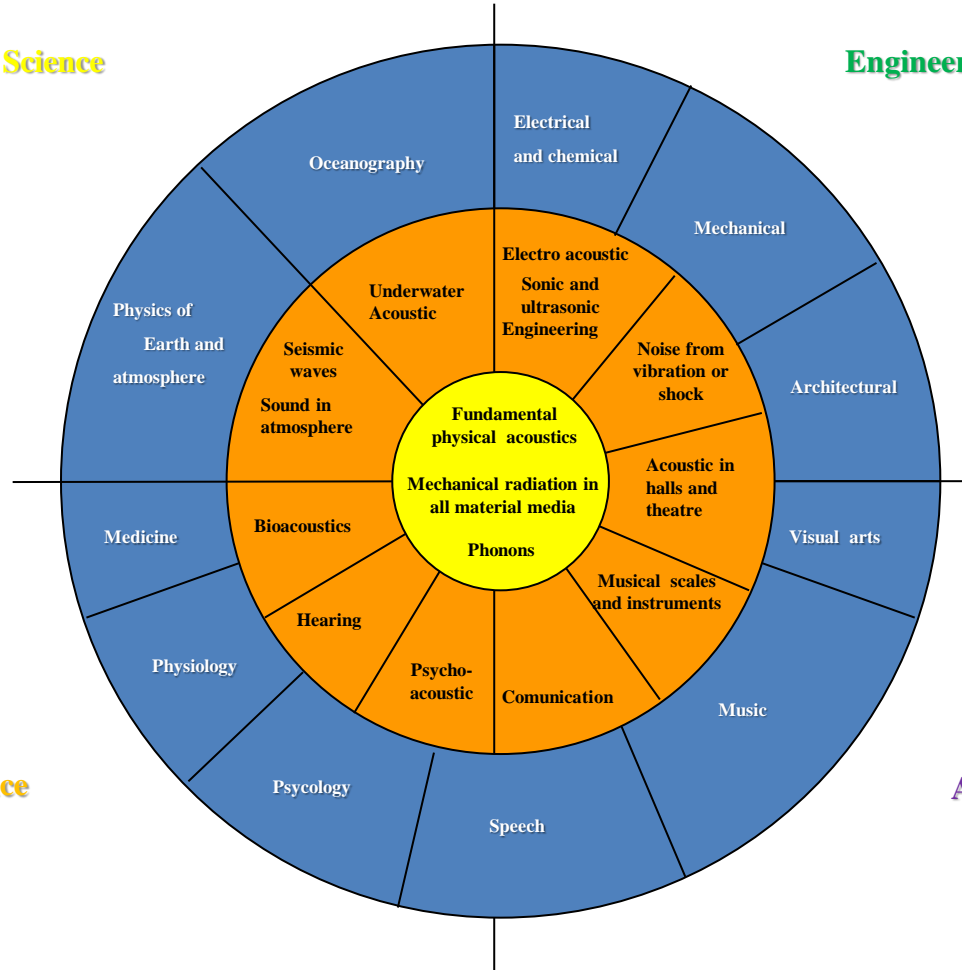


ENERGETICA ACUSTICA



Earth Science

Engineering



Life Science

Arts



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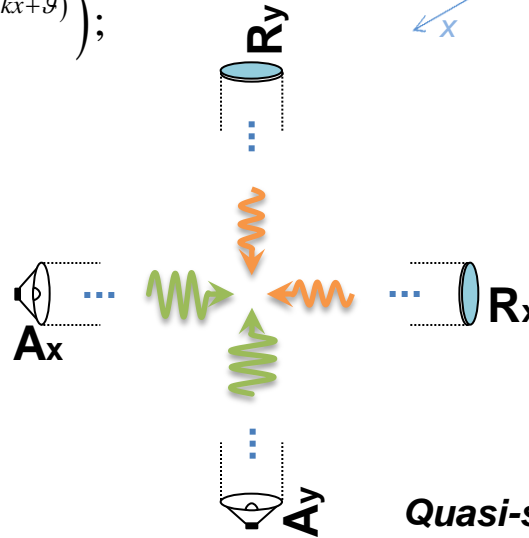


Quasi-stationary wave in 1D

$$\phi(x, t) = A c \left(e^{i(\omega t - kx)} + R e^{i(\omega t + kx + \vartheta)} \right);$$

Divergent spherical wave in 3D

$$\phi(r, t) = \frac{\hat{A} e^{i(\omega t - kr)}}{r};$$



Quasi-stationary wave in 2D

$$\phi(x, y, t) = \Re \left\{ A_x c \left(e^{i(kx - \omega t)} + R_x e^{i(kx + \omega t + \vartheta_x)} \right) + A_y c \left(e^{i(ky - \omega t)} + R_y e^{i(ky + \omega t + \vartheta_y)} \right) \right\}$$

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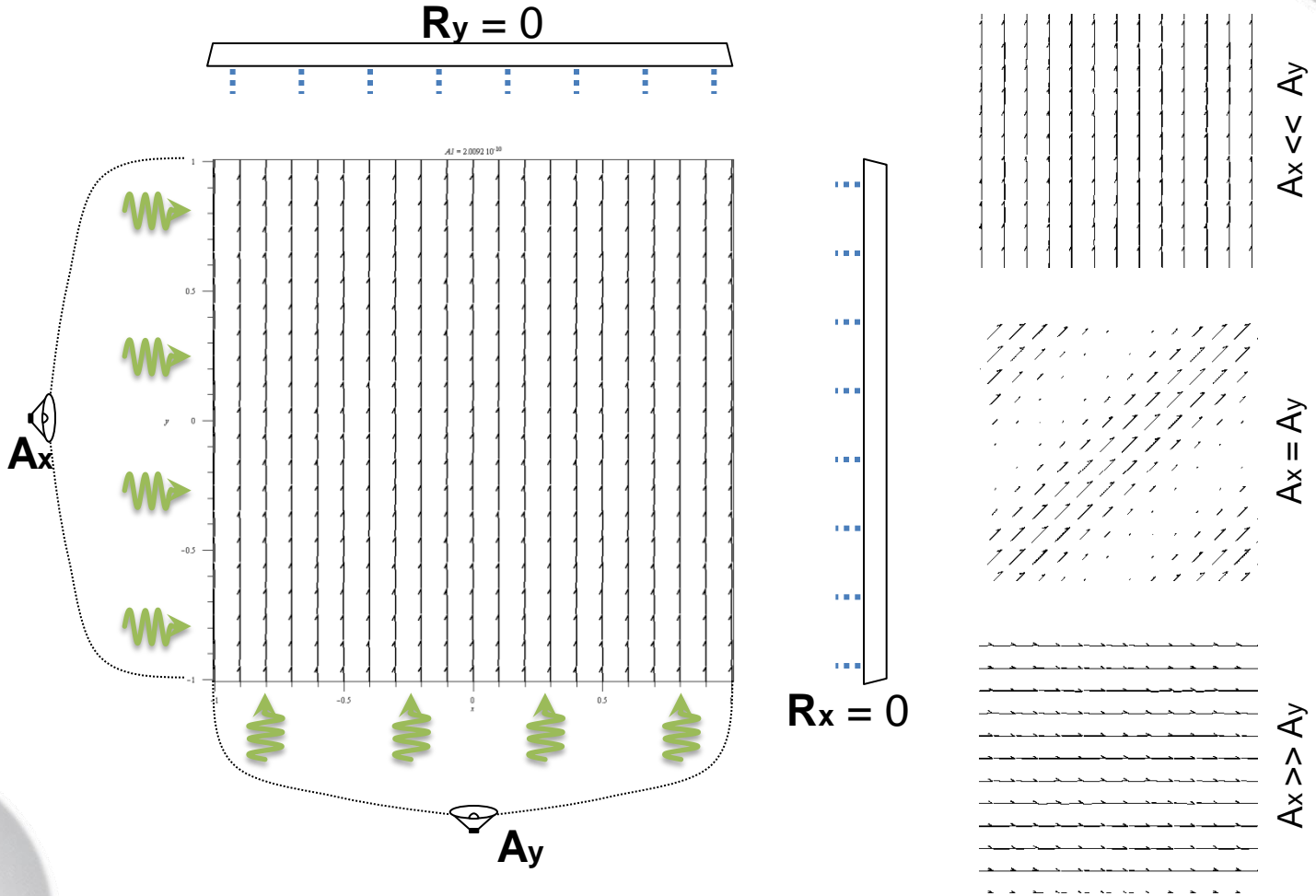
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Potenziale cinetico

$$\phi(\mathbf{x}, t)$$

$$\begin{cases} p(\mathbf{x}, t) = -\Re \left\{ \rho \frac{\partial \phi(\mathbf{x}, t)}{\partial t} \right\} \\ \mathbf{v}(\mathbf{x}, t) = \Re \{ \nabla \phi(\mathbf{x}, t) \} \end{cases}$$

Impedenza Acustica

$$\hat{Z}(\mathbf{x}, \omega) := \frac{\hat{p}}{\hat{\mathbf{v}}} \begin{cases} R = \Re \{ \hat{Z}(\mathbf{x}, \omega) \} \\ X = \Im \{ \hat{Z}(\mathbf{x}, \omega) \} \end{cases}$$

Operatore di media stazionaria temporale

$$\langle \cdot \rangle := \lim_{T \rightarrow \infty} \frac{1}{2T} \int_{-T}^{+T} (\cdot) dt$$

Grandezze energetiche

$$\begin{cases} W_k = \left\langle \frac{1}{2} \rho \mathbf{v}^2 \right\rangle \\ W_p = \left\langle \frac{1}{2 \rho c^2} p^2 \right\rangle \\ W = W_k + W_p \end{cases}$$

Intensità complessa

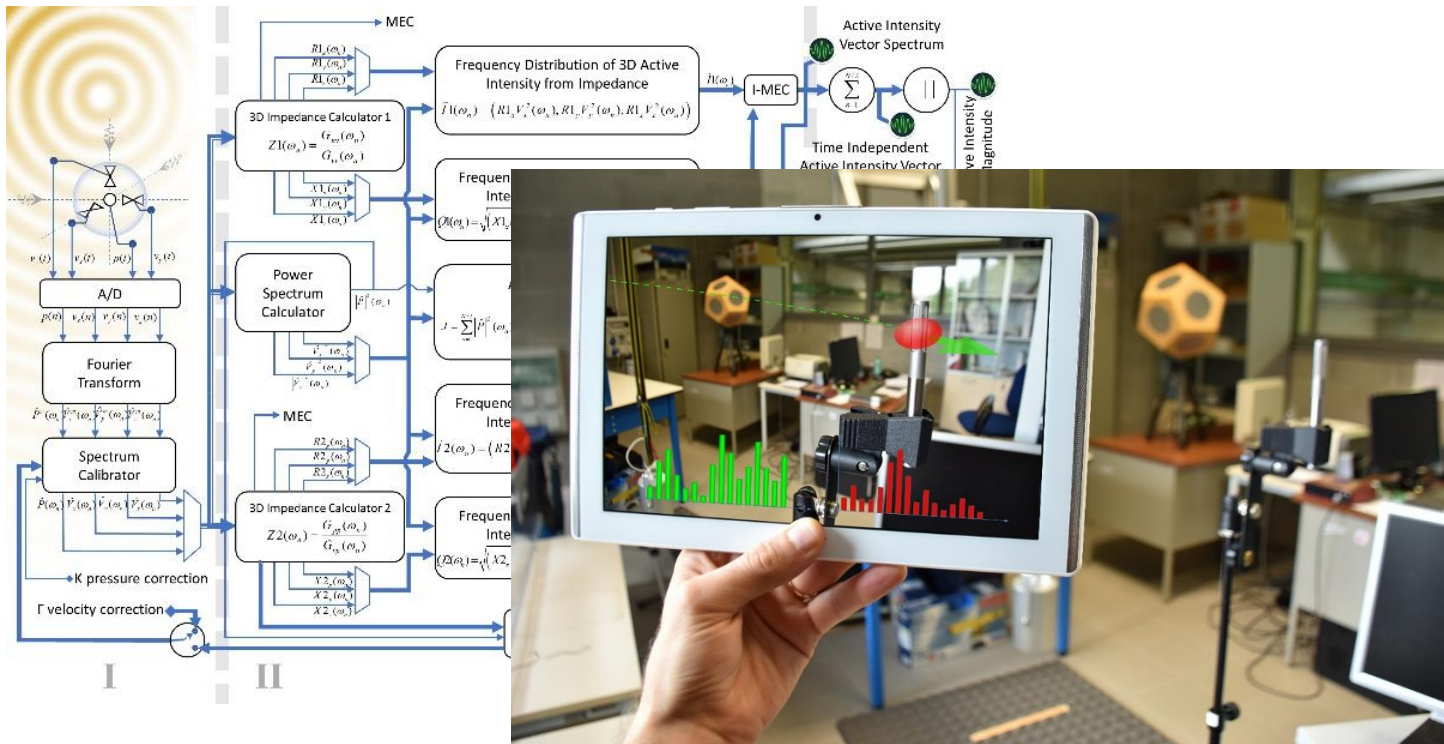
$$S = 2c \sqrt{W_k W_p}$$

$$\mathcal{S}(\mathbf{x}) := \mathbf{I}(\mathbf{x}) + i\mathbf{Q}(\mathbf{x}) \begin{cases} \mathbf{I} = \langle p\mathbf{v} \rangle \\ Q := \sqrt{S^2 - I^2} \end{cases}$$

WISI-Connection

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Domanda di brevetto CNR-UNIFE-UNdeC n. 102017000071335

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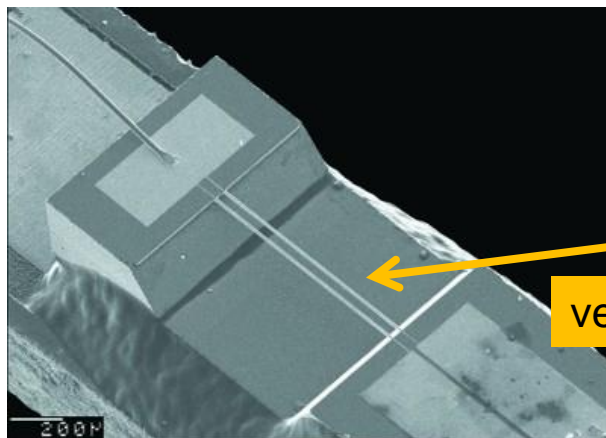


- Desarrollo de sonda p-v
- Calibracion de sondas intensimetricas
- Proyecto Europeo LIFE-NEREIDE
- Desarrollo sonda timpanometrica
- Control de dispositivos mecanicos

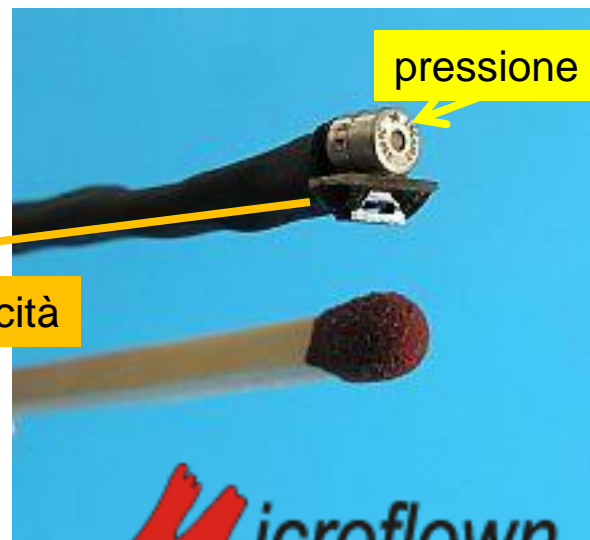
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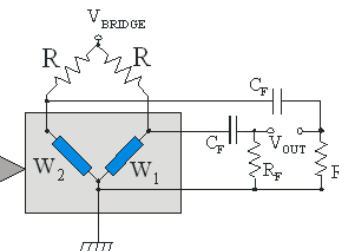
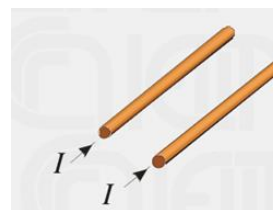
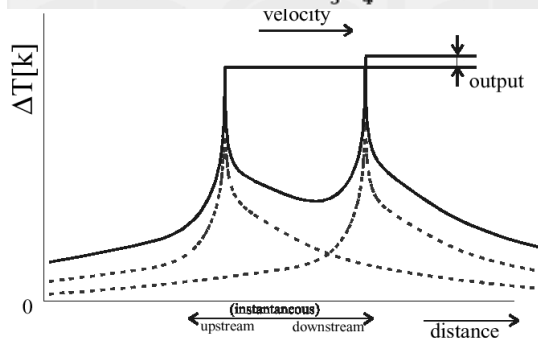
SONDA INTENSIMETRICA COMERCIAL



Sensor length: 1 mm Sensor width: 5 μm
Pt thickness: 200 nm Si_3N_4 thickness: 150 nm



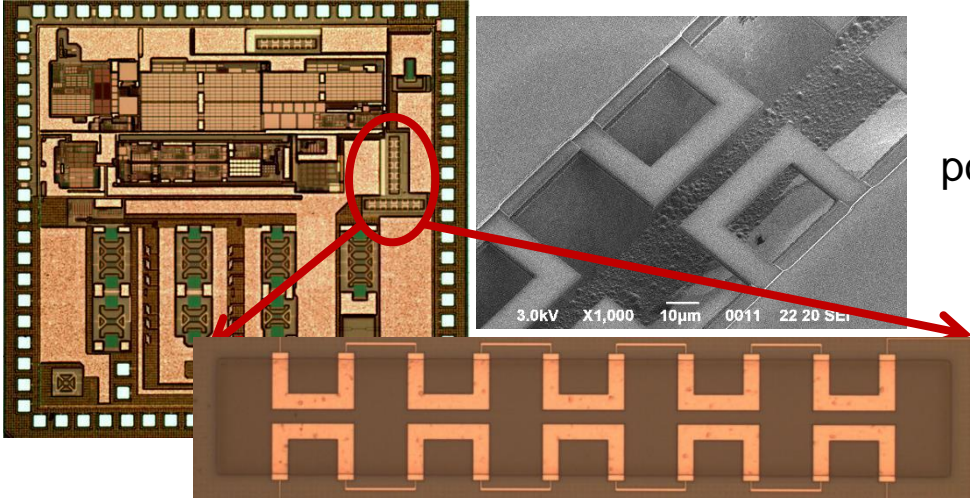
Microflow



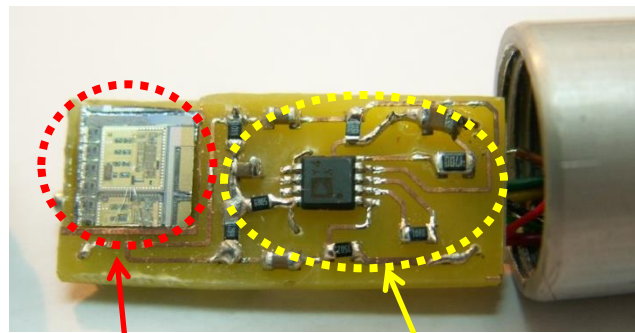
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SONDA INTENSIMETRICA CMOS

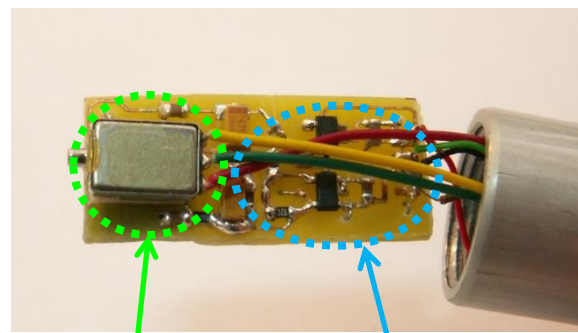


5 elementi in polisilicio en substrato de oxido de silicio



Sensore velocimetrico

Amplificazione e filtri



Microfono

Alimentazione

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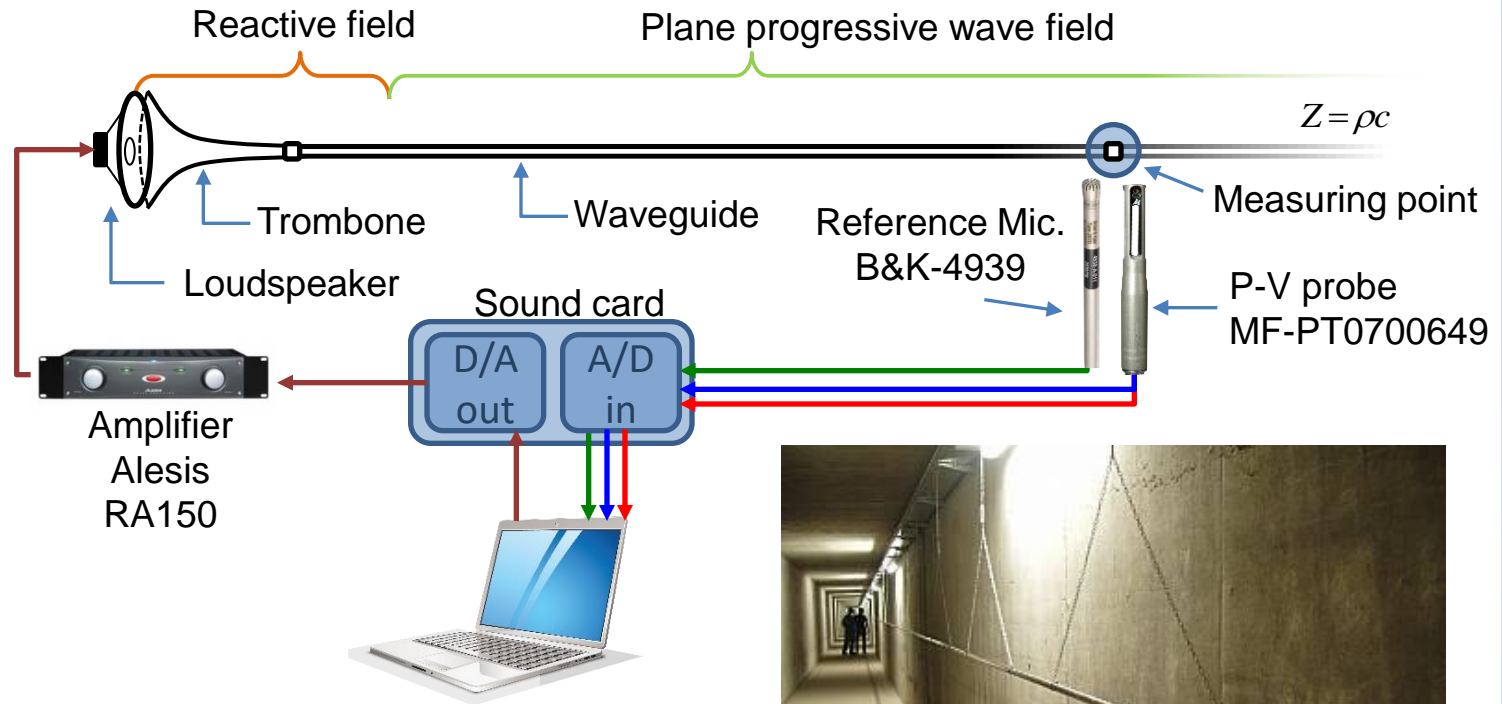


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CALIBRACION DE SONDAS INTENSIMETRICAS



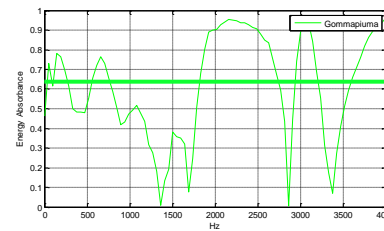
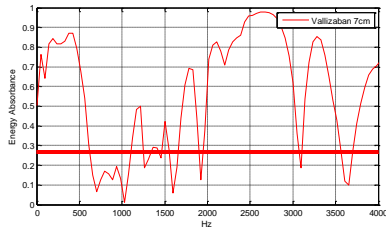
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PROYECTO EUROPEO LIFE-NEREIDE



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DESARROLLO DE SONDA TIMPANOMETRICA



neuranix
neuro technology



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Our product innovation focus

The Neuranix medical devices are not only made to be of the highest quality, but are made to satisfy users and patients. With top-of-the-line new devices and a highly qualified team, we guarantee complete satisfaction.



Human medical devices

Neuranix is currently working on a totally new device in the audiology field allowing pain free medical tests of the inner ear. The proprietary patent is currently co-developed with CNR Italy and several Italian universities and is in prototype phase one.



We are also preferred EMEA distributor of Insieme, a simple and discreet monitoring system for elderly people allowing family members to be more serene and close to your loved one without affecting their independence and privacy.

Brevetto CNR n. PD2012A000002 depositato il 3-1-2012

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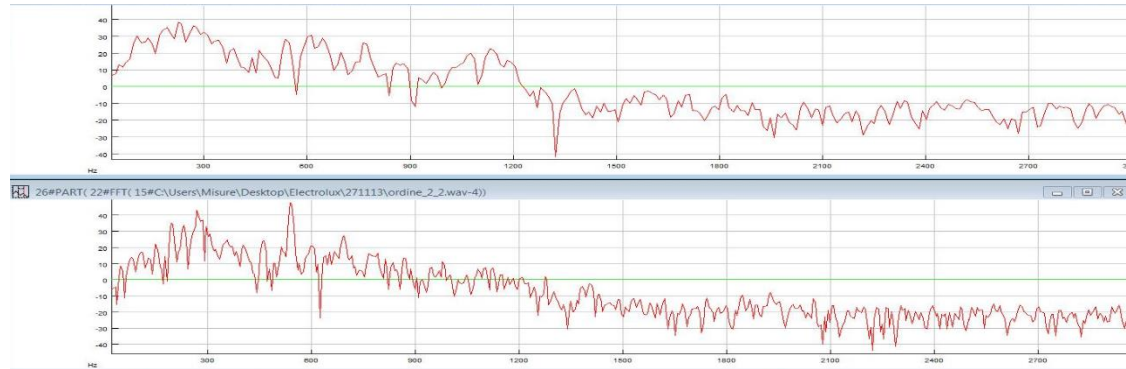
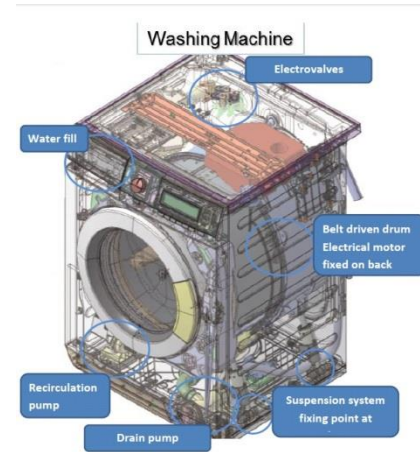
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OTRAS APLICACIONES

Control de funcionamiento de maquinarias a través del análisis acústico



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OTRAS APLICACIONES



Analisis del tipo de superficie a traves de la medicion de la impedancia acustica



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Thank you!
Muchas gracias!
Grazie mille!

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