

AVVISO DI SEMINARIO

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Meta-atoms for sound wave transmission and imaging

Abstract: We present a scanning near-field acoustic imaging technique based on a zero-mass meta-atom that exploits extraordinary acoustic transmission. The probe converts evanescent acoustic fields into propagating waves inside an air-filled waveguide, with object proximity sensed via changes in the acoustic reflection coefficient arising from the sonic Drexhage effect. By operating at the zero-effective-mass condition, the system achieves laterally isotropic, non-contact imaging with extreme subwavelength resolution. Experiments supported by theory and numerical simulations demonstrate lateral resolutions of approximately $\lambda/20$ and depth resolutions approaching $\lambda/650$ at kilohertz frequencies. This approach provides a simple, lensless platform for high-resolution acoustic near-field imaging and topography.

Venerdì 17 LUGLIO 2026 : ore 11.00

SALA LETTURA del Dipartimento SBAI – Pal. RM009

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