Plasmon-assisted coherent optical sources at the nanoscale





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A CIVIS e-journey into Nano

Plasmon-assisted coherent optical sources at the nanoscale

Interaction between localized surface plasmons and nonlinear solid-state gain media



FERROELECTRIC Nonlinear SOLID STATE LASER

Arrays of Ag NPs on LiNbO₃ formed by photo-chemical procedure



Plasmonic metasurfaces obtained by a simple and cost-effective method

Plasmonic response





High scattering cross sections that can be tuned by means of involved E polarization

Lasing around the Ag NPs chains on Nd³⁺ :LNB



Multiline operation from a single plasmon-assisted nanolaser



SHG from 2D ferroelectric–plasmonic platforms









Very high SHG enhancement factor

Perspectives



Subwavelength fluorescence-guides at ultralong distances

Perspectives





Saturable Absorber based on MoS₂ over Nd³⁺:LN

Spatial and temporal confinement of the EM radiation

What we can do...

1. Possibility of formation of arrays of Ag NPs on nonlinear solid-state gain media by P-C method

2. Demonstration of plasmon-assisted RE based solid state lasers. Improved performance with respect to conventional bulk laser operation

3. 500x Enhancement of frequency conversion processes at the nanoscale by means of LSPs

4. Multiline operation from a single plasmonic nanolaser

The results can be extended to the large diversity of solid-state lasers with the subsequent impact on the applications







