

## Electrochemical Design of Optical Nanoantennas

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**Abstract.** Electrochemical techniques for fabricating tapered gold nanoantennas (tips) are discussed. In the paper, the tunable design of nanoantennas is demonstrated. Tip parameters such as a tip apex curvature, mesoscopic morphology, aspect ratio and enhancement factor can be varied with etching electrolyte and applied voltage. The low-cost method makes tip-enhanced optical spectroscopy and microscopy feasible for routine optical measurements beyond the diffraction limit.

Keywords: optical antennas, tip-enhanced Raman scattering, electrochemistry.

Optical antennas have applications in different areas such as photovoltaics, optical microscopy and spectroscopy because of the capability to enhance light by orders of magnitude and to localize light energy within dimensions beyond the diffraction limit [1]. The paper describes a electrochemical technique for preparing gold tapered antennas to control optical near-fields [2]. Different etching regimes have been investigated. Under design we understand a control and optimization of the tip apex curvature, mesoscopic surface and enhancement factor.

## References

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