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Designing broadband plasmonic nanoantennas for ultrasensing ZHENHUAN YI, KAI WANG, DMITRI V. VORONINE, ANDREW TRAVERSO, ALEXEI SOKOLOV, Institute for Quantum Science and Engineering, Texas A&M University, College Station, TX 77843 — Various designs of broadband plasmonic nanoantennas made of gold and silver nanospheres are considered and optimized for ultrasensitive spectroscopic applications. The simulated nanostructures show a broadband optical response which may be tuned by varying the size, position and composition of nanospheres. Near-field enhancement in nanoantenna hot spots is analyzed and compared with previous literature results in the case of a fractal plasmonic nanolens. Broadband plasmonic nanoantennas may allow detecting ultrasmall concentrations of toxic materials and may be used for decoding DNA and for ultrafast nanophotonics applications.

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