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Complex metallic nanostructures using self-assembled DNA templates for SERS and plasmonic applications MAURICIO PILO-PAIS, ANNE WATSON, Duke University, THOM LABEAN, North Carolina State University, GLEB FINKELSTEIN, Duke University — We custom-tune the plasmonic resonance of complex metallic nanostructures based on "DNA origami" templates (∼90x70nm). Briefly, 5 nm gold nanoparticles are attached at selected places within a DNA-origami "nano-breadboard" and later enlarged, and even fused, by electroless deposition of silver. By this method, we are able to control the size and topology, and therefore the plasmonic resonance of the resulting metallic nanostructures. We perform SERS measurements of various Raman molecules (i.e. 4-aminobenzenethiol), which are chosen based on the plasmonic resonance frequency of the structure. The flexibility of the design and multiply parallel nature of the method open the road for designing and fabricating optimum structures for a desired plasmonic application.

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