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Optimizing energy transfer efficiency in highly branched nanoplasmonic waveguides DMITRI VORONINE, ANDREW TRAVERSO, KAI WANG, ZHENHUAN YI, ALEXEI SOKOLOV, Institute for Quantum Science and Engineering, Texas A&M University, College Station TX — Energy transfer in highly branched nanoplasmonic particle waveguides is simulated and optimized by varying the waveguide branching geometry and composition. The periodically branched nanostructures provide a new route towards efficient nanoscale light concentration and local field enhancement. On the one hand, they mimick the analogous randomly branched plasmonic nanostructures which have been previously used for surface-enhanced optical spectroscopy such as SERS. On the other hand, the design is inspired by branched molecular aggregates used for energy funneling. The proposed nanostructures may find applications in sensing, light harvesting and nanophotonics.

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