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**Ultrafast strong broadband light source generated in nanoscale plasmonic Au-AAO-Al structures**[1] JUNBO HAN, Univ of Washington and Huazhong University of and Science and Technology, LINHUA YAO, Huazhong University of and Science and Technology, ZONGWEI MA, High Magnetic Field Laboratory, Chinese Academy of Science — we demonstrate an ultrafast strong broadband photoluminescence (PL) from Au-AAO-Al composite under low excitation power intensity of 3.8˜34.5 GW/cm2. The emission wavelength is in the range of 450-1050 nm and the lifetime is under sub-nanosecond. Comparative studies of PL in Au-AAO-Al with different Au rod length and Au-AAO without Al coupling layer, together with the finite difference time domain (FDTD) calculations, present that the fast PL originates from the surface plasmon enhanced supercontinuum generation (SCG) in AAO membrane. The observations indicate that strong SCG could be realized in nanoscale plasmonic structures, which have promise applications in the minimization and integration of ultrafast lighting sources in photonic devices.

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