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**Enhancement of coherent terahertz beam with chaotic electrodes in a photoconductive antenna** DONG HO WU, BENJAMIN GRABER, LOUIS PECORA, CHRISTOPHER KIM, U.S. Naval Research Laboratory — We investigated terahertz beam emission from photoconductive antennas containing various shapes of electrodes. With a pair of curved (e.g. concave shape) electrodes it appears that electrons (mostly thermal electrons) follow chaotic trajectories, which keep the electrons away from the surface plasma so that the surface plasma can coherently oscillates without being disrupted by thermal electrons, resulting a slightly increased coherent terahertz power. For an emitter with a pair of ripple electrodes, the classical Poincare surface section map using Birkoff coordinate tends to exhibit chaotic sea and KAM islands if the ripple amplitude becomes comparable to the electrode gap, indicating considerable electron bunching in between the ripple electrodes. Our data show that, when the bunched electrons are stimulated by terahertz pulses, the emitter produces additional spontaneous coherent terahertz beams, which is known as Dicke effect. We will discuss details of our experiments and results.

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