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Title:Quasi-optical theory of relativistic submillimeter surface-wave oscillators

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Abstract:Within the framework of a quasi-optical approach, the nonlinear theory of relativistic surface-wave oscillators is developed. By presenting the radiation field as a sum of two counter-propagating wave-beams which are coupled on a shallow corrugated surface, we describe formation of an evanescent slow wave. Taking into account the excitation of a slow wave by a sheet electron beam, we simulate linear and nonlinear stages of interaction that allows us to define the threshold conditions, the electron efficiency, and the output coupling. It is shown that the considered type of an oscillator can be used for generation of powerful sub-THz radiation.

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