

207

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Title:Analytical theory of an RF generator phase-locked by the resonant load with delayed reflection

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Abstract:The theory is developed which describes evolution of an RF generator (auto-oscillator) coupled by a waveguide with an outer resonator. The treatment is based on a simplified universal method which implies the following conditions to be valid: 1) the resonant load  $Q$  is much higher than that of the generator, 2) the generator-load coupling is weak, but non-zero, and, 3) the system evolution time is much longer than the lifetime of active medium particles. When the parameters of such a system, including the wave delay time, belong to an optimum region, the generator, after a delay, becomes frequency pulled to the outer resonator.

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