

**Development of Millimeter-Wave FEM for Electron-Positron Colliders\***, A.A. KAMINSKY, A.K. KAMINSKY, S.N. SEDYKH, A.P. SERGEEV, JINR; G.G. DENISOV, N.S. GINZBURG, N. YU. PESKOV, A.S. SERGEEV, IAP RAS - An FEM oscillator with a Bragg resonator based on an induction linac LIU-3000 (0.8 MeV, 200 A, 200 ns) was developed. The highest FEM-oscillator's efficiency of 26% was achieved at a frequency of 31 Ghz. Computer simulation showed the possibility of single-mode or multi-mode operation regimes depending on the resonator type and its Q-factor. Both regimes were realized experimentally. The radiation spectrum width of the oscillator in single-mode regime allows using it as a HF source for electron-positron colliders. A 36.4 GHz FEM amplifier with an original RF input device is now at the stage of early beam experiments. The operation of the input device is based on the wave splitting in irregular waveguide. Its main features are the high efficiency, on-line control of the input power and absence of any elements in electron beam aperture. "Cold" measurements of the RF input efficiency are in good agreement with the simulation results.

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