Abstracts

A YIG-Tuned Nonlinear Transmission Line Multiplier

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This paper describes a distributed frequency multiplier with a YIG-tuned output filter for stable, yet infinitely tunable microwave signals. The multiplier is a nonlinear transmission line (NLTL) which can be driven with a 10-200 MHz, 1-3 W sinusoidal power source to produce a voltage sawtooth wave with >200 harmonics. These harmonics are selected by a YIG-tuned bandpass filter, resulting in sinusoidal outputs with low spurious content and a frequency stability derived from the source. This circuit offers tunability far exceeding that of step-recovery diode multipliers at the expense of increased size and lower efficiency. However, an important result of this experiment shows that practical monolithic multipliers for millimeter-wave outputs can be filtered with little or no degradation in their performance.

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