

Pembangkitan gelombang mikro 10 GHz tunable dengan mixing dua laser diode = 10 GHz tunable microwave generation by mixing two laser diodes

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Abstrak

[ABSTRAK

Pada tesis ini diuraikan mengenai teknik Heterodyne Optics yang memadukan dua dioda laser dengan terdapat perbedaan panjang gelombang yang dapat dimanfaatkan dalam pembangkitan gelombang mikro yang dapat diaplikasikan dalam dunia radar. Untuk memperoleh output gelombang mikro yang tunable maka diperlukan sumber laser yang dapat diseleksi panjang gelombangnya, baik melalui perubahan temperatur untuk jenis laser DFB ataupun dengan mengubah posisi pitch grating untuk jenis External Cavity Laser Diode. Sistem optik diterapkan untuk mengatasi phase noise dan bit error rate akibat sistem frequency multiplier pada sistem Dielectrik Resonance Oscillator (DRO). Hasil eksperimen menunjukkan bahwa tunable laser dapat menghasilkan stepping selisih panjang gelombang 0,01nm dan menghasilkan gelombang mikro tiap 0,1GHz yang artinya sistem ini sangat berpotensi untuk menghasilkan gelombang mikro untuk RADAR pada berbagai frekuensi.

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ABSTRACT

We describe in this paper the construction 10 GHz microwave source using a heterodyne optics technique that combines two laser diodes with a wavelength differences can be utilized in the generation of microwaves to be applied in radar. To obtain the output microwave tunable laser source is needed which can be selected wavelength. DFB laser can be tune by change the temperature and ECLD can be tune by mechanical grating. Optical system is alternative that can solve the phase noise and bit error rate at Dielectrik Resonant Oscillator (DRO) system. The experimental results show that the tunable laser can be generate stepping of 0.01 nm wavelength differences and generating microwave 0.1 GHz, which means each of these systems has the potential to generate microwaves for RADAR at various frequencies;We describe in this paper the construction 10 GHz microwave source using a heterodyne optics technique that combines two laser diodes with a wavelength differences can be utilized in the generation of microwaves to be applied in radar. To obtain the output microwave tunable laser source is needed which can be selected wavelength. DFB laser can be tune by change the temperature and ECLD can be tune by mechanical grating. Optical system is alternative that can solve the phase noise and bit error rate at Dielectrik Resonant Oscillator (DRO) system. The experimental results show that the tunable laser can be generate stepping of 0.01 nm

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