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Title:Microwave generation with low residual phase noise from a femtosecond fiber laser with an intracavity electro-optic modulator
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Abstract:Low phase-noise microwave generation has previously been demonstrated using self-referenced frequency combs to divide down a low noise optical reference. We demonstrate an approach based on a fs Er-fiber laser that avoids the complexity of self-referenced stabilization of the offset frequency. Instead, the repetition rate of the femtosecond Er-fiber laser is phase locked to two cavity-stabilized cw fiber lasers that span 3.74 THz by use of an intracavity electro-optic modulator with over 2 MHz feedback bandwidth. The fs fiber laser effectively divides the 3.74 THz difference signal to produce microwave signals at harmonics of the repetition rate. Through comparison of two identical dividers, we measure a residual phase noise on a 1.5 GHz carrier of -120 dBc/Hz at 1 Hz offset.
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