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Spin Modulation in Semiconductor Lasers JEONGSU LEE, WILLIAM FALLS, RAFAL OSZWALDOWSKI, IGOR ZUTIC, SUNY, University at Buffalo — We study analytically dynamical operation of semiconductor lasers with injection (pump) of spin-polarized electrons, previously considered in the steady-state regime [1-5]. Using complementary approaches of quasi-static and small signal analyses, by carefully including the presence of holes [4,6], we elucidate how the spin modulation in semiconductor lasers [7] improves performance, as compared to the conventional (spin-unpolarized) counterparts. We reveal that the spin-polarized injection can lead to an enhanced bandwidth and desirable switching properties of spin-lasers. Supported by ONR, AFOSR, NSF-ECCS CAREER.

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