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Title:Tunable ring laser with internal injection seeding and an optically-driven photonic crystal reflector

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Abstract:Continuous tuning over a 1.6 THz region in the near-infrared (842.5-848.6 nm) has been achieved with a hybrid ring/external cavity laser having a single, optically-driven grating reflector and gain provided by an injection-seeded semiconductor amplifier. Driven at 532 nm and incorporating a photonic crystal with an azobenzene overlayer, the reflector has a peak reflectivity of  $\sim 80\%$  and tunes at the rate of 0.024 nm per mW of incident green power. In a departure from conventional ring or external cavity lasers, the frequency selectivity for this system is provided by the passband of the tunable photonic crystal reflector and line narrowing in a high gain amplifier. Sub - 0.1 nm linewidths and amplifier extraction efficiencies above 97% are observed with the reflector tuned to 842.5 nm.  $\copyright$  2012 Optical Society of America.

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Main heading:Photonic crystals

Controlled terms:Frequency bands - Reflection - Ring lasers

Uncontrolled terms:Cavity lasers - Continuous tuning - External cavity lasers - Extraction efficiencies - Frequency selectivity - Grating reflectors - Green power - High gain amplifier - Hybrid rings - Injection seeding - Line-narrowing - Near Infrared - Pass bands - Peak reflectivity - Photonic crystal reflectors - Semiconductor amplifiers - Tunable photonic crystal - Tunable ring lasers

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