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Low Current N-type Quantum Dash Semiconductor Optical Amplifiers

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Abstract: In this letter, we propose the use of light N-type doping to enhance the optical gain of the quantum dash semiconductor optical amplifier (SOA) at low applied current. We find that doping the dashes with light donor concentration increases the unsaturated optical gain and widens the optical gain spectrum range at low applied current. Also, our calculation reveals that the use of N-type doping is associated with a reduction in the slope efficiency and a decrease in the transparency current, which makes N-type quantum dash SOA attractive for low power dissipation applications.