Physics > Optics

High Q micro-ring resonators fabricated from polycrystalline aluminum nitride films for near infrared and visible photonics

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We demonstrate wideband integrated photonic circuits in sputter-deposited aluminum nitride (AlN) thin films. At both near-infrared and visible wavelengths, we achieve low propagation loss in integrated waveguides and realize high-quality optical resonators. In the telecoms C-band (1520-1580 nm), we obtain the highest optical Q factor of 440,000. Critical coupled devices show extinction ratio above 30 dB. For visible wavelengths (around 770 nm), intrinsic quality factors in excess of 30,000 is demonstrated. Our work illustrates the potential of AlN as a low loss material for wideband optical applications.

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