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Team Builds More Efficient Quantum Cascade Laser

From chemical spectroscopy to free-space optical communications, a growing number of applications can benefit from lasers emitting in the IR between 8 and 12 μm . In recent years, many have looked closely at quantum cascade laser technology for these types of applications.

Now Manijeh Razeghi at the Center for Quantum Devices at **Northwestern University** in Evanston, Ill., has changed the method of growing the material used in the quantum wells. Instead of using solid-state molecular beam epitaxy, her team used gas molecular beam epitaxy, which enhanced the quality of the material. Razeghi also altered the method of doping the material and made changes in the design of the waveguide. These adjustments led to a quantum cascade laser operating at up to 140 K with a threshold current density of 2.5 kA/cm².