

## **Widely tunable Raman ring laser using highly nonlinear fiber.**

### **Abstract**

An all-optical widely tunable Raman fiber laser has been realized by incorporating a highly nonlinear fiber in a ring cavity. By feedback a portion of Raman Stokes wave back into the highly nonlinear gain medium, a Raman fiber laser is generated. We found that the lasing wavelength of Raman fiber laser can be tuned from 1537 to 1568 nm with peak power fluctuation within 1 dB, giving a total wavelength tunability of 31 nm. The optical signal-to-noise ratio is found to be wavelength dependent, and the highest optical signal-to-noise ratio of about 59 dB is recorded. The lasing threshold of the Raman fiber laser with this configuration is found to be as low as 300 mW

**Keyword:** Raman fiber lasers; Fiber lasers; Ring lasers; Fibers.