Toward broad Raman generation in the continuous wave regime

M. Katsuragawa

Department of Engineering Science, Graduate School of Informatics and Engineering,
University of Electro-Communications, Japan
Email: katsura@pc.uec.ac.jp

Abstract

Broad Raman sideband generation based on an adiabatic driving of maximal coherence has succeeded in the nanosecond pulsed regime. The related various demonstrations, such as femtosecond / sub-femtosecond pulse generation, control of carrier-envelope-offset frequency of the broad Raman sidebands, arbitrary optical waveform generation, and so on, have been shown. Here, we discuss an extension of this technique to the continuous wave (cw) regime. We show the two experimental results which were carried out toward the broad Raman sideband generation in the cw regime. One is by employing an enhancement cavity and the other is by employing the hollow core photonic crystal fiber, where the generations were tested in the nanosecond pulsed regime. In either case, the Raman sideband generations were enhanced by ~ 3,000 times. Figure 1 shows a typical result obtained by employing the enhancement cavity technique. The broad Raman sidebands were generated with a nearly flat intensity distribution over 130 THz (656 – 941 nm).

Fig. 1. Raman sidebands adiabatically generated in the enhancement cavity.