Dependence of a microresonator Kerr frequency comb on the pump linewidth

We experimentally investigate the dependence of Kerr comb generation, comb linewidth, and coherent system performance on the pump linewidth in a microresonator. We find that the generation of the primary comb can have a larger tolerance to the pump linewidth compared with that of the low-phase-noise comb. In addition, the linewidths of the generated combs are almost linearly dependent on the pump linewidth in the primary and low-phase-noise states. Furthermore, the optical signal-to-noise ratio penalty between the pump and generated Kerr combs in a coherent communication system is less than 0.2 dB in both the primary and low-phase-noise states, showing that Kerr frequency combs in these two states can have similar coherent system performance to the pump.