All-Optical envelope detection and fiber transmission of wireless signals by external injection of a DFB laser

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We outline a novel method for all-optical envelope detection of wireless signals by exploiting cross-gain modulation effects in a distributed feedback laser operating with optical injection. We successfully demonstrate envelope detection of a 20-GHz carrier amplitude-shift-keying modulated signal at 2.5 Gb/s and its transmission over a 70-km optical fiber link. We present results including bit-error-rate measurements, signal waveforms, and receiver sensitivity penalties associated with envelope detection and fiber transmission.
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