obtained here could be further optimized by engineering the waveguide cross section or employing other III-V materials with higher n_2 values such as AlGaAs using a similar procedure to the one used here. The advantage of our approach of bonding the III-V layer to a silicon substrate is that the nonlinear InGaP waveguide can be optically coupled to a SOI or SiN-on-insulator optical waveguide circuit, enabling easy integration with other well-developed linear devices on such platforms. Techniques developed for heterogeneously integrating III-V lasers on the SOI platform can be employed here. For example, adiabatic tapers in both the silicon and III-V layers can be used to couple light between the SOI and the III-V waveguide layer [13]. Microdisk resonators in the III-V layer can also be coupled to an underlying silicon waveguide [14]. Thus, it is a promising approach for a variety of applications in particular for all-optical signal processing in telecommunications. The use of III-V materials also creates the possibility to exploit their inherently large second-order nonlinearity. These avenues will be explored in future work.

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