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Title:Forward and backward THz-wave difference frequency generations from a rectangular nonlinear waveguide

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Abstract:We report forward and backward THz-wave difference frequency generations at 197 and 469 um from a PPLN rectangular crystal rod with an aperture of 0.5 (height in z) \times 0.6 (width in y) mm2 and a length of 25 mm in x. The crystal rod appears as a waveguide for the THz waves but as a bulk material for the optical mixing waves near 1.54 um. We measured enhancement factors of 1.6 and 1.8 for the forward and backward THzwave output powers, respectively, from the rectangular waveguide in comparison with those from a PPLN slab waveguide of the same length, thickness, and domain period under the same pump and signal intensity of 100 MW/cm2. Number of references:10