Space-selectively crystallized fiber with second-order optical nonlinearity for variable optical attenuation

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We have fabricated $BaO-TiO_2-GeO_2-SiO_2$-based glass fibers with the oriented space-selectively crystallized structure by laser irradiation and also demonstrated variable optical attenuation induced by electro-optical birefringence change based on second-order optical nonlinearity. The transmittance of a polarized signal is controlled by an electric field applied to the fiber, and the electro-optic fiber devices are operated with extremely low nanowatt electric power dissipation.

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