Effect of fiber-spinning profile on plug-and-play quantum-key distribution systems

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Abstract: The spin profile of a fiber is usually optimized to reduce transmission impairments caused by polarization-mode dispersion (PMD). In this paper, we show that fiber-optic-based plug-and-play quantum-key distribution systems using polarization modulation and fibers with a spin profile optimal for PMD may suffer from a large Faraday rotation induced by the geomagnetic field. We show that, for periodic spin patterns of small periods, the Faraday rotation is minimum when no spin is applied to the fiber. © 2008 Optical Society of America.

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