Continuous-variable quantum key distribution using coherent polarization state discretely modulated by an intrinsically stable polarization-modulated unit

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We propose a method for quantum key distribution(QKD) based on discrete modulated coherent polarization state, and provide a potential experimental scheme using an intrinsically stable unit to implement the modulation. Instead of encoding in field quadratures, we modulate key information on Stokes operators. Our discrete modulation method is shown to be asymptotically Gaussian modulation according to central limit theorem. Security analysis of Gaussian modulation regime is also suitable for our modulation scheme, and we show that this scheme is secure against individual eavesdropping attacks.

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