

Abstract Submitted
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Scalable fiber integrated source for higher-dimensional path-entangled photons¹ ROBERT POLSTER, CHRISTOPH SCHAEFF, RADEK LAPKIEWICZ, ROBERT FICKLER, SVEN RAMELOW, ANTON ZEILINGER, University of Vienna — Higher dimensional Hilbert spaces are expected to show intriguing higher order effects. Examples are higher dimensional perfect correlations or the unsolved problem of finding a complete set of MUBs for dimension 6. Higher dimensional systems also have advantages for QKD protocols. Our approach is to build an easy to use platform to access these dimensions. We realized an in-fiber, high brightness and high fidelity source for path-entangled quNits in the telecom band. It is purely integrated in fiber and only standard off-shelf components are used. This results in high stability and scalability in terms of complexity with increasing dimension. In order to manipulate and transform the produced entangled states we implemented multiports in integrated optical technology, enabling us to perform any unitary transformation depending on its internal settings[1]. Results up to dimension 4 (ququarts) will be presented in the talk. [1] M. Reck, A. Zeilinger, H. J. Bernstein and P. Bertani, PRL 73, 1 (1994)

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