

Abstract Submitted  
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**Experimental realization of an entanglement access network and secure multi-party computation** XIUYING CHANG, Center for Quantum Information in Tsinghua University, DONGLIN DENG, Department of Physics, University of Michigan, XINXING YUAN, PANYU HOU, YUANYUAN HUANG, Center for Quantum Information in Tsinghua University, LUMING DUAN, Department of Physics, University of Michigan, DEPARTMENT OF PHYSICS, UNIVERSITY OF MICHIGAN COLLABORATION, CENTER FOR QUANTUM INFORMATION IN TSINGHUA UNIVERSITY TEAM — To construct a quantum network with many end users, it is critical to have a cost-efficient way to distribute entanglement over different network ends. We demonstrate an entanglement access network, where the expensive resource, the entangled photon source at the telecom wavelength and the core communication channel, is shared by many end users. Using this cost-efficient entanglement access network, we report experimental demonstration of a secure multiparty computation protocol, the privacy-preserving secure sum problem, based on the network quantum cryptography.

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