

Abstract Submitted
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A telecom-wavelength conversion from near-infrared light based on a cold Rubidium atomic ensemble¹ WEI CHANG, YUNFEI PU, NAN JIANG, CHANG LI, SHENG ZHANG, LUMING DUAN, Center for Quantum Information, IIIS, Tsinghua University, CENTER FOR QUANTUM INFORMATION LAB4, IIIS, TSINGHUA UNIVERSITY TEAM — Exponential photon transmission losses in fiber is a severe limitation to realize long-distance quantum communication. It's helpful to use telecom-wavelength photon transmission to mitigate these absorption losses. However, typical atomic electronic transition from ground-level is in visible wavelengths or near-infrared wavelengths, such as transitions based on Rubidium. Here we report our progress in telecom-wavelength conversion from 780nm to 1475nm and from 795nm to 1530nm in a cold optically thick gas of Rubidium. Both these two conversions are using a diamond configuration transition that we use $5S_{1/2}$ - $5P_{3/2}$ - $4D_{3/2}$ cascade transition for the 780nm to 1475nm route and $5S_{1/2}$ - $5P_{1/2}$ - $4D_{3/2}$ cascade transition for the 795nm to 1530nm route.

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