

Frequency translation with single ions

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Here we present an experimental scheme to interact two ion species by creating a photonic link between them. The photons from each ion are frequency converted to an intermediate wavelength by difference frequency generation. These photons can then be interfered on a beam splitter to verify their indistinguishability. In our experiment we use single calcium and ytterbium ions trapped on separate microfabricated ion traps. This technique could have applications in hybrid quantum computing and quantum communication.

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