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Quantum dynamics of multiple local phonons in a trapped-ion chain¹ RYUTARO OHIRA, SHOTA KUME, KYOICHI TAKAYAMA, SILPA MURALIDHARAN, KENJI TOYODA, Osaka Univ — We demonstrate a projective measurement for observing the dynamics of multiple local phonons in a trapped-ion chain. The probability amplitude of each local phonon is mapped to the auxiliary long-lived motional ground states. After the mapping process, sequential state-dependent fluorescence detection is performed. We also realize controlling the multiple local phonon dynamics by driving the Jaynes-Cummings interactions.

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