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Chirped nonlinear cavity for digital quantum state readout without switching OFER NAAMAN, QNL, UC Berkeley, JOSÉ AUMENTADO, NIST, Boulder, LAZAR FRIEDLAND, Racah Institute of Physics, Hebrew University, Jerusalem, Israel, JONATHAN WURTELE, Department of Physics, University of California, Berkeley, IRFAN SIDDIQI, QNL, UC Berkeley — We observe a new phase-locking effect in a high-Q cavity embedding a Josephson junction driven with a chirped microwave signal. Above a critical drive amplitude, the cavity phase-locks to the drive and its oscillation amplitude grows with time. Below threshold, the cavity dephases from the drive and its amplitude remains small. The transition to phase-locking is associated with a sharp threshold sensitive to the junction I_0, and can be used for digital detection of quantum states. This detector smoothly evolves into one oscillation state or the other without relying on any switching process.

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