An optical clock platform with strontium atoms in tweezers
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— Arrays of strontium atoms trapped within optical tweezers provide an intriguing
new platform for optical frequency metrology, with a unique combination of ap-
pealing features including relatively large particle numbers, absence of interatomic
collisions, long coherence times, and low dead times through repeated lossless imag-
ing. Further, if Rydberg interactions were introduced between the tweezer-trapped
atoms, the microscopic control afforded by this system may enable entanglement-
enhanced performance. Here, we demonstrate highly coherent excitation of the ultra
narrow $^1S_0$ to $^3P_0$ clock transition in arrays of tweezer-trapped $^{88}$Sr atoms, as well
as repeated interrogation of the same ensemble of atoms using high-fidelity, low loss
measurements. These results provide the key ingredients for a new form of highly
capable optical clocks.