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Progress on multi-ion optical clock with $^{176}\text{Lu}^+$ RATTAKORN
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for Quantum Technologies, National University of Singapore — The stability of the
current generation of ion-based optical clocks is limited due to the restriction to
single-ion operation. Multi-ion operation is complicated by inhomogenous magnetic
fields, micromotion-related shifts induced by the trapping radio-frequency field, and
electric quadrupole shifts arising from the Coulomb fields of neighboring ions. The
three clock transitions in $^{176}\text{Lu}^+$ have favorable properties for multi-ion operation
including, low sensitivity to magnetic fields, low differential static scalar polarizabil-
ity, and the quadrupole shifts can be suppressed by appropriate orientation of the
applied magnetic field. Here, we report progress on establishing clock operation on
a small linear Coulomb crystal of lutetium ions.

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