

Abstract Submitted  
for the MAR09 Meeting of  
The American Physical Society

**Micromagic clock: microwave clock based on atoms in an engineered optical lattice** KYLE BELOY, ANDREI DEREVIANKO, Univ. of Nevada, Reno, VLADIMIR DZUBA, VICTOR FLAMBAUM, Univ. of New South Wales, Sydney — We propose a new class of atomic microwave clocks based on the hyperfine transitions in the ground state of aluminum or gallium atoms trapped in optical lattices. For these elements *magic* wavelengths exist at which both levels of the hyperfine doublet are shifted at the same rate by the lattice laser field, cancelling its effect on the clock transition. This work represents an elegant piece of theoretical physics containing a challenge to the experimentalist to realize a new frequency standard based on these proposed clocks.

Kyle Beloy  
University of Nevada, Reno

Date submitted: 21 Nov 2008

Electronic form version 1.4