

Abstract Submitted
for the 4CS19 Meeting of
The American Physical Society

Coherent Captain Mills: The Search for Sterile Neutrinos¹

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Neutrinos are ubiquitous sub-atomic particles populating every part of the universe.
Their lack of electric and color charge makes them susceptible to only weak and
gravitational interactions. The observation of neutrino oscillations confirms that
the active neutrinos (ν_e , ν_μ , ν_τ) are comprised of three mass eigenstates with
 Δm^2 values between 10^{-3} to 10^{-5} eV². However, a persistent phenomenon has been
observed at LSND, MiniBooNE and other short-baseline experiments (SBE) where
 $\Delta m^2 \sim 1\text{eV}^2$ is not compatible with the current mixing between mass eigenstates.
However, a 4th neutrino, a sterile neutrino (ν_s) That doesn't participate in weak
interactions could explain the phenomena observed as SBE's. An experiment has
been constructed at TA-53 at Los Alamos National Laboratory, the Coherent Cap-
tain Mills experiment (CCM), to investigate this large $\Delta m^2 \sim 1\text{eV}^2$ and determine
conclusively whether or not this large Δm^2 is due to a "new" sterile neutrino.

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Date submitted: 12 Sep 2019

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