Status of nEDM Experiment

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nEDM personnel

- Brad Plaster (Faculty – Kentucky)
- Chris Daurer (Engineer – contractor)
- Jan Boissevain (Engineer – contractor)
- Larry Bartoszek (Engineer – contractor)
- Rick Allen (Engineer – Oak Ridge)
- Adrian Perez Galvan (Postdoc – Caltech)
- Brad Filippone (Faculty – Caltech)
nEDM Experiment

• Will search for neutron‘s Electric Dipole Moment (EDM) with unprecedented sensitivity
  – If we find a nEDM it could explain one of the most puzzling questions about our Universe:
    • If the Universe started as a ball of energy
    • Then since Energy $\rightarrow$ matter + antimatter
    • Why is there so MUCH more matter than antimatter today??

• To do this we will measure the frequency of a precessing neutron (Nuclear Magnetic Resonance) very precisely

• This requires careful control of all magnetic fields
  – Suppression of the earth’s field by $\sim$ 100,000 - 1,000,000

• We will do this with a cryogenic ferromagnetic shield, a superconducting shield and a room temperature mu-metal shield
Project Management

• Originally project managed by Los Alamos
• DOE wanted management to be moved to Oak Ridge National Lab (since experiment would take data at SNS
  – Transition occurred 6/09
  – Vince Cianciolo is Project Manager
  – Rick Allen is Project Engineer
Project Milestones, Schedule and Funding

• “Large” DOE projects have 5 approval stages
  – CD0 = Approve Mission Need (2005)
  – CD1 = Approve Preliminary Baseline Cost Range (2007)
    • Preliminary design begun
  – CD2 = Approve Performance Baseline (2010)
    • Establishes Cost and Schedule of project
    • Awaiting successful cryogenic HV test
  – CD3 = Approve Start of Construction (2011)
    • Final engineering completed and contracts awarded
  – CD4 = Approve Start of Operations (2016)
Funding Status

• DOE and NSF plan to jointly fund project

• Caltech and U. Illinois have received approval for NSF funding for nEDM subject to CD2 approval by DOE

• Magnetic shields would be purchased through Caltech