Abstract Submitted
for the DAMOP13 Meeting of
The American Physical Society

Role of GNOME in dark-matter searches SZYMON PUSTELNY, Institute of Physics, Jagiellonian University/Department of Physics, University of California at Berkeley, MAXIM POSPELOV, Department of Physics and Astronomy, University of Victoria/Perimeter Institute for Theoretical Physics, MICAH P. LEDBETTER, Department of Physics, University of California at Berkeley, DEREK F. JACKSON KIMBALL, Department of Physics, California State University-East Bay, WOJCIECH GAWLIK, Institute of Physics, Jagiellonian University, DMITRY BUDKER, Department of Physics, University of California at Berkeley/Nuclear Science Division, Lawrence Berkeley National Laboratory, PRZEMYSLAW WLODARCZYK, Faculty of Computer Science, Electronics and Telecommunications, AGH University of Science and Technology/Institute of Physics, Jagiellonian Universit, JOSHUA SMITH, JOCELYN READ, California State University, Fullerton, CHRIS PANKOW, Center for Gravitation and Cosmology, University of Wisconsin, Milwaukee, GNOME COLLABORATION — We present a novel scheme for exotic-interaction searches. The scheme enables detection of short-time interaction between spins and other objects, whose signatures in traditional studies are buried in noise or cannot be singled out from instrumental artifacts. These short signals may, for example, arise, when spins interact with a jet of exotic particles or go through a non-uniform scalar field. It is shown that their detection is possible with synchronous measurements of readouts of at least five spatially separated devices, whose readouts are correlated. The application of a new scheme is demonstrated based on an example of Global Network of Optical Magnetometers for Exotic physics (GNOME).

Dmitry Budker
University of California at Berkeley

Date submitted: 30 Jan 2013 Electronic form version 1.4