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Design and operation of a DANCE/LANSCE fission-tagging detector R.R.C. CLEMENT, Lawrence Livermore National Laboratory, Livermore, California 94550, USA, M. FOWLER, Sumner Associates, Santa Fe, New Mexico 87501, USA, J.A. BECKER, Lawrence Livermore National Laboratory, Livermore, California 94550, USA, T.A. BREDEWEG, Los Alamos National Laboratory, Los Alamos, New Mexico 87545, USA, R.A. MACRI, Lawrence Livermore National Laboratory, Livermore, California 94550, USA, D.J. VIEIRA, Los Alamos National Laboratory, Los Alamos, New Mexico 87545, USA, C.Y. WU, U. AGVAANLUVSAN, Lawrence Livermore National Laboratory, Livermore, California 94550, USA, M. CHADWICK, Los Alamos National Laboratory, Los Alamos, New Mexico 87545, USA, K. MOODY, Lawrence Livermore National Laboratory, Livermore, California 94550, USA, J. O'DONNELL, Los Alamos National Laboratory, Los Alamos, New Mexico 87545, USA, W. PARKER, Lawrence Livermore National Laboratory, Livermore, California 94550, USA, R. REIFARTH, R.S. RUNDBERG, J. SCHWANTES, J. ULLMANN, J. WILHELMY, Los Alamos National Laboratory, Los Alamos, New Mexico 87545, USA, P. WILK, Lawrence Livermore National Laboratory, Livermore, California 94550, USA, J.M. WOUTERS, Los Alamos National Laboratory, Los Alamos, New Mexico 87545, USA, J. YURKON, National Superconducting Cyclotron Laboratory, East Lansing, Michigan 48824, USA, LAWRENCE LIVERMORE NATIONAL LABORATORY, LIVERMORE, CALIFORNIA 94550, USA TEAM, SUMNER ASSOCIATES, SANTA FE, NEW MEXICO 87501, USA TEAM, LOS ALAMOS NATIONAL LABORATORY, LOS ALAMOS, NEW MEXICO 87545, USA TEAM, NATIONAL SUPERCONDUCTING CYCLOTRON LABORATORY, EAST LANSING, MICHIGAN 48824, USA TEAM — The 4π BaF₂ Detector for Advanced Neutron Capture Experiments (DANCE) at Los Alamos Neutron Science Center (LANSCE) was designed and built to measure neutron capture cross sections, $X(n,\gamma)$, for small, sub-milligram, radioactive samples. The DANCE beam-line at the Lujan Center provides neutrons from thermal to about one hundred keV permitting $X(n,\gamma)$ measurements over a large energy range. However, one

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beam-line at the Lujan Center provides neutrons from thermal to about one hundred keV permitting $X(n,\gamma)$ measurements over a large energy range. However, one difficulty in the neutron capture measurement on actinides is the contribution of the fission component $X(n,f)$ to the measured gamma-ray spectrum. The solution to this dilemma is the addition of a fission-tag to the event. The fission-tagging detector is a cylindrical ppac (parallel plate avalanche counter) collocated with the fissionable sample. The response of the detector to fission fragment pairs would provide the necessary event information to separate the (n,γ) and (n,f) reactions. A detailed description of the design and operation of the gas-handling system will be presented, together with details of the design and operation of the fission-tagging detector.\Work performed under the auspices of the U.S. DoE by the University of California,Alamos National Laboratory (W-7405-ENG-36), Lawrence Livermore National Laboratory (W-7405-ENG-48) and the U.S. NSF by the National Superconducting Cyclotron Laboratory (PHY-0110253). Work benefited from use of Los Alamos Neutron Science Center (W-7405-ENG-36).