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Studies of the ^{198}Hg(d,d′) and ^{198}Hg(d,p) reactions A. DIAZ VARELA, P.E. GARRETT, V. BILDSTEIN, A.T. LAFFOLEY, A.D. MACLEAN, E.T. RAND, C.E. SVENSSON, University of Guelph, G.C. BALL, TRIUMF, T. FAESTERMANN, Technische Universität München, R. HERTENBERGER, H.-F. WIRTH, Ludwig-Maximilians-Universität München — Limits on the electric dipole moment (EDM) continue to decrease for ^{199}Hg, the most stringent upper limit for a nuclear EDM to date. The experimental limit on the observed atomic EDM for ^{199}Hg is converted to limits on fundamental CP-odd interactions via a calculation of the nuclear Schiff moment, requiring knowledge of the nuclear structure of ^{199}Hg. The $E3$ and $E1$ strength distributions to the ground state of ^{199}Hg, and $E2$ transitions amongst excited states, would be ideal information to further constrain ^{199}Hg Schiff moment theoretical models. The high level density of ^{199}Hg makes those determinations challenging, however similar information can be obtained from exploring surrounding even-even Hg isotopes. As part of a campaign to study the Hg isotopes near ^{199}Hg, two reactions, ^{198}Hg(d,d′)^{198}Hg and ^{198}Hg(d,p)^{199}Hg were studied using the Q3D spectrograph at the Maier-Leibnitz Laboratory (MLL) at Garching, Germany. A 22 MeV deuterium beam was used to impinge a ^{198}Hg^{32}S target. The (d,d′) reaction allows us to probe the desired $E2$ and $E3$ matrix elements, while the (d,p) reaction provides information on the neutron single-particle states of ^{199}Hg.

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