

Abstract Submitted
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Ion Acceleration by Magnetic Pinch Instabilities- Powerful Neutron Sources ANNA HAYES, HUI LI, Los Alamos Natl Lab — Since the 1950s pinch discharges with deuterium gas have been known to produce large neutron bursts. During these early quests for laboratory fusion it was initially believed that the heat produced in the pinch led to sufficiently high temperatures that these neutrons resulted from thermonuclear (TN) burn. However, a series of careful measurements led by Stirling Colgate was carried out to show that these neutrons did not result from TN burn. Rather, they resulted from an $m=0$ sausage mode instability that accelerated the ions, causing beam-target interactions. Today, this same mechanism is used in dense plasma focus machines to generate intense neutron pulses for neutron activation experiments. One such experiment, to test the criticality of aging plutonium, is currently being planned at the Nevada Test Site. Helping to characterize the neutrons from the dense plasma focus to be used in this large experiment was the last applied physics project that Stirling worked on. In this talk we will summarize the physics issues involved both in the original discovery in the 1950s and in today's experiments.

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