Dependence of z-pinch mass ablation rate on wire size and inter-wire gap

EDMUND YU, Sandia National Labs, BRYAN OLIVER, Mission Research Corporation, Albuquerque, NM, PAVEL SASOROV, Institute of Theoretical and Experimental Physics, Moscow, DAN SINARS, MIKE CUNEO, TOM MEHLHORN, Sandia National Labs — A wire array z-pinch spends 60-80% of its lifetime in a mass ablation phase, during which wire cores remain stationary while burning off hot coronal material. Experiments have demonstrated a dependence of the mass ablation rate on wire size and inter-wire gap [1,2]. We present a highly simplified model of wire ablation which attempts to capture the dominant physics driving this dependence. Comparison between theory, simulation, and experiment are presented.


Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy’s National Nuclear Security Administration under contract DE-AC04-94AL85000.