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Microsecond current output in PbNb(Zr,Sn,Ti)O3 ceramic under shock wave compression JIANG DONGDONG, DU JINMEI, YANG JIA, GU YAN, FENG YUJUN, LABORATORY FOR SHOCK WAVE AND DETONATION PHYSICS RESEARCH, INSTITUTE OF FLUID PHYSICS TEAM, ELECTRONIC MATERIALS RESEARCH LABORATORY, XI'AN JIAOTONG UNIVERSITY, XI'AN, 710049 COLLABORATION — Technology of high power pulse has been the core of many scientific and engineering applications. Shock wave-driven ferroelectric power supply is smaller, lighter and at the same time more powerful than traditional technology. We reported the shock wave induced current output of PbNb(Zr,Sn,Ti)O3 ceramic. Chosen composition was Pb0.99Nb0.02[(Zr0.90Sn0.10)0.96Ti0.04]0.98O3 and near the ferroelectric and antiferroelectric phase boundary. Shock wave obtained via gas-gun projectile impact ranged from 0.24 to 2.50 GPa and depolarized ceramics in the normal mode, in which the shock propagation vector was perpendicular to the remanent polarization. Variation of electric field was by selecting a load resistor. Output currents under short-circuit and high-impedance conditions were obtained. Results suggest that PbNb(Zr,Sn,Ti)O3 is a promising material for a source of power supply and provide a basis for future pulse power design.

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