Abstract Submitted
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Rogowski coils for studies of detonator initiation DOUGLAS TASKER, Los Alamos Natl Lab — The Rogowski coil dates back to 1887 and it has commonly been employed to measure rapid changes of electrical currents without direct contact with the circuits, especially in high energy density applications. Recently, it has been used to measure currents in relatively low energy devices such as semiconductor circuits; here we report its utility in the analysis of detonator initiation. From an electrical perspective, the coil is essentially an air-cored transformer and measures the temporal rate of change of current *dI/dt*. Following a careful characterization of the circuit, an accurate measurement of this derivative is shown to provide a complete solution of the detonator circuit, including current, voltage, power and energy delivered to the detonator. The dependence of the electrical sensitivity, accuracy and bandwidth on coil design will be discussed and a new printed circuit design will be presented. Interesting features in the initiation of exploding bridgewire detonators have been observed with this coil and the results of various experiments will be discussed.

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