

Abstract Submitted  
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**Fast Resistive Bolometry** JEFFREY GRAHAM, SETTHIVOINE YOU, PAUL BELLAN, Caltech — A bolometer with microsecond scale response time is under construction for the Caltech spheromak experiment to measure radiation from a  $\sim 20 \mu\text{s}$  duration plasma discharge emitting  $\sim 10^2\text{--}10^3 \text{ kW/m}^2$ . A gold film several micrometers thick absorbs the radiation, heats up, and the consequent change in resistance can be measured. The film itself is vacuum deposited upon a glass slide. Several geometries for the film are under consideration to optimize the amount of radiation absorbed, the response time and the signal-to-noise ratio. We measure the change in voltage across the film for a known current driven through it; a square pulse (3—30A,  $\sim 20 \mu\text{s}$ ) is used to avoid Joule heating. Results from prototypes tested with a UV flashlamp will be presented. After optimizing the bolometer design, the final vacuum-compatible diagnostic would consist of a plasma-facing bolometer and a reference in a camera obscura. This device could provide a design for fast resistive bolometry.

Jeffrey Graham  
Caltech

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