The calorimeter uses embedded, nanofabricated photonic sensor arrays to enable micrometer-scale spatial resolution of dose (energy) distribution and gradients. It replaces thermistors (used in conventional radiation calorimeters) with photonic sensors of various designs embedded in numerous possible materials (such as graphite, diamond, water, human tissue, silicon, etc.) for in-situ dose and dose-gradient measurements.

**INEXPENSIVE SMALL SCALE MEASUREMENT IDEAL FOR CELLULAR DOSIMETRY**

These new devices will have much higher spatial resolution, lower self-heating, reduced artifacts at sensor-absorber interfaces, and capability for imaging using arrays of sensors on a chip (2D) and arrays of chips (3D). Improves capability to measure dose and dose gradients (near beam penumbras and near surfaces or material boundaries) for measuring energy deposition from beams (photon, electron, etc.) with low penetration depth.

**BENEFITS**

Leverages inexpensive commercial communications technology and chip fabrication for inexpensive manufacturing and operation.

Technically superior by enabling absolute dosimetry at an unprecedented physical scale due to micron-scale spatial resolution across six orders-of-magnitude of absorbed dose, from medical diagnostic and therapeutic procedures up through industrial materials processing, sterilization, and applications leading to commercialization of space.

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