Abstract Submitted
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Thermoluminescence-based heat flux measurements across a composite polymer structure.[1] FIROUZEH SABRI, UoM-Dept. of Physics and Materials Science, STEVE ALLISON, EMCO, MAKUNDA ARYAL, PRATIKSHYA PARAJULI, UoM — Phosphor thermometry provides an accurate, remote, and instantaneous temperature reading mechanism that can be easily incorporated into temperature sensors designed for cryogenic temperatures as well as high temperatures. Phosphor thermometry is based on excitation and subsequent temperature dependent emission, typically in the visible spectrum. The emission results from the shielded 4f state of a rare earth constituent in the phosphor, in this case Eu3+ and is similar in spectrum to the isolated atom. The most common measurement strategies are the lifetime and intensity ratio approach. Recent efforts by the authors has demonstrated the feasibility of PDMS+La2O2S:Eu3+ composite polymers as temperature sensors that have the same temperature response as the powders alone. The work here describes recent efforts to design, create, and characterize a thin, flexible, heat flux measurement unit based on phosphor thermometry principles. Results will show heat flux calculations based on temperature measurements performed across a sandwich layer consisting of three separate layers of composite materials over a range of temperatures

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