

Abstract Submitted
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Performance estimates of ratiometric quantum dot thermometry for the NASA ZBOT experiment¹ DAVID OLSON, MANOOCHEHR KOOCHESFAHANI, Michigan State University — A whole-field planar optical technique for thermometry in the NASA Zero Boil-off Tank (ZBOT) experiment has been previously presented. The technique is based on ratiometric Laser Induced Fluorescence (LIF) using nanocrystal quantum dots (QD) that are modified to dissolve into the working fluid (perfluoropentane) of the ZBOT experiment. In this talk, we will discuss performance modeling of this two-color ratiometric LIF thermometry approach using two different sensing strategies: dual monochrome cameras with an optimized color filter set and a single camera with a standard Bayer color filter. The developed performance model is compared to measurements of both detection strategies in the ZBOT Breadboard setup.

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