

Abstract Submitted
for the DFD10 Meeting of
The American Physical Society

Temperature characterization of CdSe/ZnS quantum-dots applied on anodized-aluminum coating AKIHISA AIKAWA, Sophia University, HIROTAKA SAKAUE, JAXA — We have developed a quantum-dot (QD) based anodized-aluminum temperature-sensitive paint (AA-TSP) as a global temperature sensor. Compared to a conventional TSP, which uses a polymer as a supporting matrix, the AA-TSP can provide a narrow FWHM that provides a potential to create a multi-color TSP. By using anodized aluminum as a supporting matrix, the resultant AA-TSP extends the temperature detection range, which is limited by a conventional supporting matrix of a polymer. The temperature calibration shows that a resultant AA-TSP can detect the temperature from 100 to 500 K. Six different QDs are chosen for temperature characterizations of the AA-TSP, whose luminescent peaks are at 481, 518, 543, 555, 587, and 615 nm in toluene. The temperature sensitivity of the resultant AA-TSP ranges from -0.6 to -1.5 percent/K. With increase in the luminescent peak, the sensitivity increases. An application of the resultant AA-TSP for a global temperature measurement in a hypersonic wind tunnel is included in addition to the temperature characterizations.

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Date submitted: 07 Aug 2010

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