

Abstract Submitted
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Development of molecular based optical techniques for thermometry and velocimetry for fluorocarbon media¹ SHAHRAM POUYA, GARY BLANCHARD, MANOOCHEHR KOOCHESFAHANI, Michigan State University — Fluorocarbon solvents are very stable inert fluids with unique physical properties that make them attractive compounds as refrigerant and several medical applications such as contrast enhanced ultrasound imaging. Since they do not mix with typical organic solvents or water, most luminescent (fluorescent or phosphorescent) probes cannot be used as tracers for optical diagnostic techniques. Perfluoropentane, a compound from this family, is used as a simulant fluid by NASA for two-phase heat transfer/mixing experiments under micro-gravity condition due to its low boiling temperature. Here we study the feasibility of employing non-intrusive optical methods for measurements of temperature and/or velocity within Perfluoropentane as the working fluid. Preliminary results of temperature and velocity measurement using Laser Induced Fluorescence and Molecular Tagging Velocimetry are presented.

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