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Characteristics of seeding particles for PIV/PTV analysis TAL HADAD, Ben-gurion University, ALEXANDER LIBERZON, Tel-Aviv University, ANNE BERNHAIM, ROI GURKA, Ben-Gurion University — PIV and PTV are non-intrusive state-of-the-art techniques widely used for flow measurements. Seeding particles are required to be used as tracers to the flow. The accuracy of the velocity measurements is limited by the ability of the tracer particles to adequately follow the instantaneous motion of the continuous phase. In order to follow the flow effectively, the particles should satisfy numerous requirements: size, sphericity, density, high refractive index, concentration and chemical inert. Since seeding particles for liquids are commonly polymer-based particles we probe the influence of their surface coating on the results obtained from optical measurements. Using a canonical lid-driven cavity flow we measured the velocity field using PIV and PTV and compared the results (velocity and acceleration) obtained with the same particles with and without chemical treatment of surfactants. Probability density functions of the results using particles before and after treatment are compared statistically utilizing the two-sample Kolmogorov-Smirnov tests. Although the mean values exhibit similar trends, fluctuations and velocity derivatives show some discrepancy in respect to the chemical treatment. The obtained results show a variance of up to 5% between the values obtained for using washed and un-washed particles, for both PIV and PTV experiments with some influence related to the size of the particles.

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