Gridded Analysis of Volumetric Particle Velocity Data MATT
STEGMEIR, TSI Incorporated — 2-Frame and time-resolved Volumetric Particle
Tracking has become an increasingly valuable tool for 3-D flow characterization.
Unstructured, randomly-distrubted data are typically produced by tracking individ-
ual particle locations either between 2 sequential image frames or by constructing
longer Lagrangian particle position tracks to from highly time-resolved data. High-
resolution datasets are typically interpolated onto an ordered grid in order to pro-
vide greater convenience in data presentation and to facilitate calculation of derived
quantities. Interpolation schemes are compared for accuracy and resolution, and
robustness to spurious data points. Improvements are proposed to provide for in-
creased resilience against noise and spurious data points in experimental data sets.
Results are compared to standard Gaussian-weighted interpolation. Single- realiza-
tion and statistical results are presented from analysis of synthetic and experimental
datasets.

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