

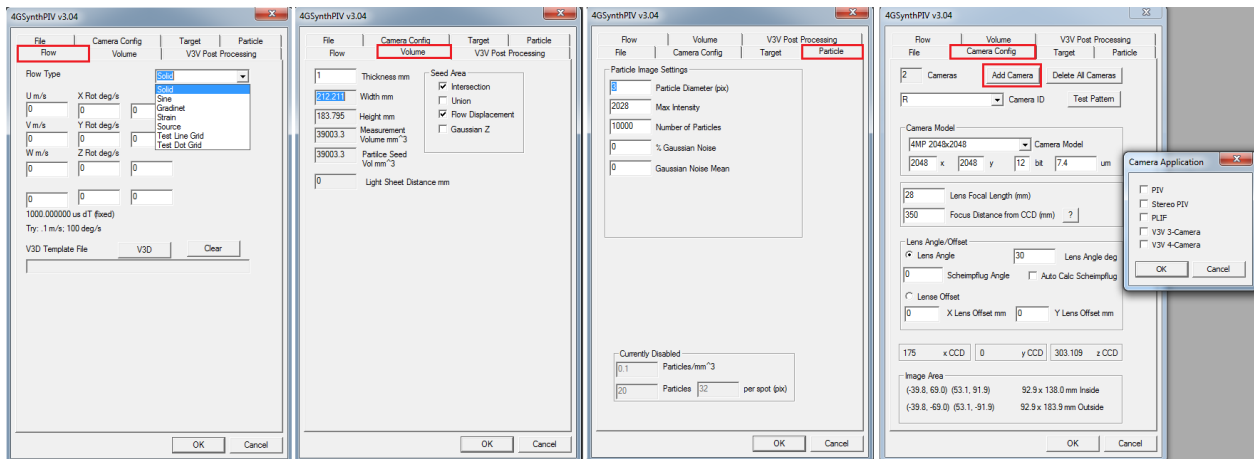
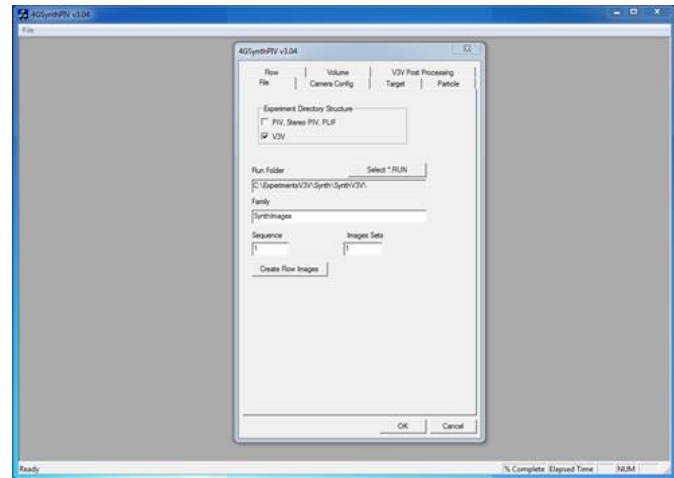
INSIGHT™ 4G AND INSIGHT V3V™-4G SYNTHETIC EXPERIMENTS SOFTWARE CAPABILITIES

APPLICATION NOTE INSIGHTV3V-4G-003 (US)

Processing of Synthetic Experiments Created using SynthPIV v3.04

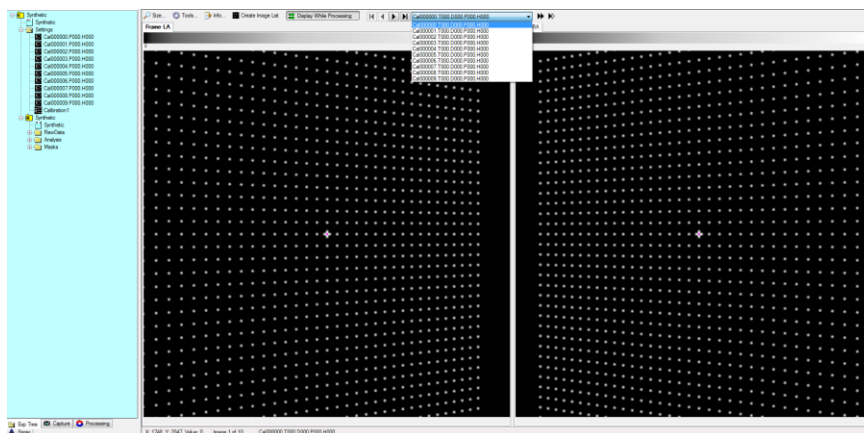
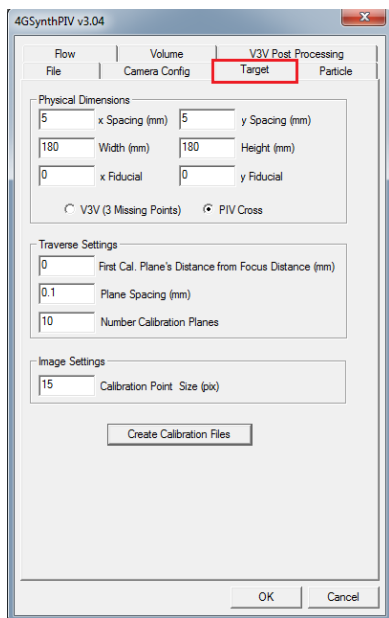
SynthPIV v3.04 is a program used to generate a virtual PIV/SPIV/PLIF experiment for INSIGHT™ 4G software or a virtual V3V experiment for INSIGHT V3V™-4G software.

The software can be used to generate easily synthetic particle images of different type of flows, size of field/volume of views and particle size/density. The camera(s) configuration can also be customized in the software as shown below:



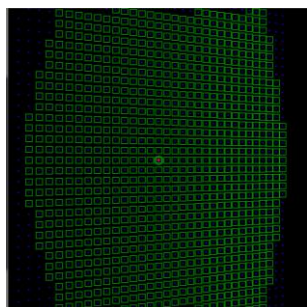
SynthPIV v3.04 can also be used as a tool to create a calibration file and use it to process an existing experiment in INSIGHT 4G software for PIV/SPIV/PLIF or INSIGHT V3V-4G software for volumetric velocimetry V3V system. A target-free calibration experiment can then be performed using this tool where synthetic images of a calibration target are generated and loaded into INSIGHT 4G software automatically. This can be very helpful in the cases where a calibration target is not available or cannot be used in the flow field.

The example below shows a pair of synthetic calibration images obtained from the SPIV camera configuration specified below. Ten calibration images of a single level virtual target with a grid pattern spacing of $5 \times 5 \text{ mm}^2$ and spaced of 0.1 mm were generated for each camera:

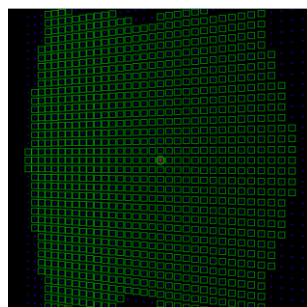


Synthetic calibration images loaded in Insight 4G software

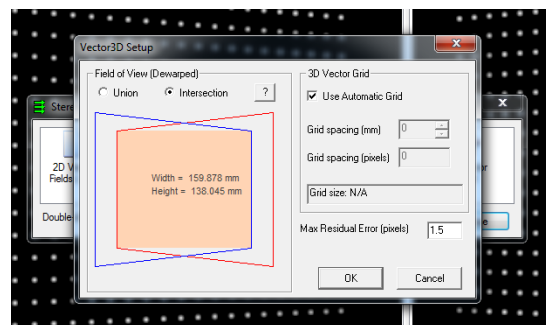
The virtual calibration images created were saved to the “Settings” folder of the corresponding Experiment in INSIGHT 4G software and were processed exactly in the same way if they were obtained using a real calibration target placed in the flow; the results of the calibration process are shown below and can be used for processing the particles images captured and saved already in the Experiment.



Dots identification on the image of the virtual calibration target seen by the Left camera



Dots identification on the image of the virtual calibration target seen by the Right camera



FOV final size calculated by Insight 4G software after processing the synthetic calibration images



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