PIV data files are text files that have information about the auto-correlation or cross correlation peaks. Values are tab-separated and the files can be opened directly by Excel (for example).

Row 1:

3 integers that tell the # of vectors in x, # of vectors in y, and the number of correlation peaks saved per vector (this last number is 6 as the code is now compiled), followed by the string “x locations, y locations, peaks/location”

Row 2:

2 integers that tell the fft box size and the increment between subsequent ffts, followed by the string “fft size, increment”

Row 3:
“x coord” “y coord” “value”

Subsequent Rows:
There will be x_locations * y_locations more rows
There are 18 numbers per row – 6 groups of three
Each group of three gives the location (in pixels) of the x and y location of a correlation peak, followed by the value of the peak.

For autocorrelation PIV, the largest correlation value is the self correlation (0 displacement) peak, and is located in the center of the fft box. The most likely velocity comes from the displacement between this central peak and the next largest correlation peak. The other peaks are included to allow the possibility of “fixing” bad vectors (e.g., with the PIVALT 1 command).

For cross correlation PIV, an artificial self correlation peak is added to the file to be consistent with the autocorrelation data – it’s coordinates will be half the fft box size. Once again, The most likely velocity comes from the displacement between this (artificial) central peak and the next largest correlation peak.

The actual velocity is then:

Vx = S (Column 4 – Column 1)
Vy = S (Column 5 – Column 2)

S is the scale factor that depends on the magnification and pulse separation for the particular experiment.