

Table 10.8: Significant DSP-based analog ATE matrix operations.

Description	LTX Cadence code
Matrix add/subtract	$R = D \pm U$
Root mean square	$V = \text{rms} (X)$
Integer-floating conversion	$K = \text{integer} (S)$
Boolean logic operations	$L = J \text{ xor } K$
Set all matrix elements to a constant 1.026	$X = 1.026$
Adding a constant 1.026 to all matrix elements	$W = 1.026 + W$
Indexing operations – Sum of 31st to 220th positions	$S = \text{sum} (X [31:220] )$
Fourier voltmeter Returns a 2-element array containing the cosine and sine of the <i>harmonic</i> of the <i>data</i> containing <i>no_samples</i>	$Y = \text{fvm} (\text{data}, \text{no\_samples}, \text{harmonic})$
Discrete Fourier transform <i>result</i> [1]: Total signal RMS $\times \sqrt{2}$ <i>result</i> [2]: Non-harmonic RMS $\times \sqrt{2}$ <i>result</i> [3]: DC Voltage <i>result</i> [4]: Peak Amplitude 1st harmonic of test tone $F_t$ <i>result</i> [5]: Peak Amplitude sine of 1st harmonic <i>result</i> [6]: Peak Amplitude cosine of 1st harmonic <i>result</i> [7]: Peak Amplitude 2nd harmonic of test tone $F_t$ <i>result</i> [8]: Peak Amplitude sine of 2nd harmonic <i>result</i> [9]: Peak Amplitude cosine of 2nd harmonic ...	$Y = \text{dft} (\text{result}, \text{samples}, \text{test\_tone\_freq}, \text{sampling\_freq}, \text{no\_harmonics\_desired})$
Fast Fourier transform <i>freq_domain</i> [1]: DC component of <i>time_domain</i> <i>freq_domain</i> [2]: cosine component at frequency $F_s/2$ of <i>time_domain</i> <i>freq_domain</i> [3]: cosine component of multiples of $\Delta$ of <i>time_domain</i> <i>freq_domain</i> [4]: sine component of multiples of $\Delta$ of <i>time_domain</i> ...	$\text{freq\_domain} = \text{fft} (\text{time\_domain})$
Inverse FFT	$T = \text{inverse\_fft} (F)$
Magnitude	$Y = \text{mag\_fft} (X)$
Power spectrum	$\text{power\_results} = \text{power\_fft} (\text{time\_domain})$
Phase Converts an array of cosine-sine pairs into amplitude-angle data	$\text{polar\_coord} = \text{polar} (\text{fft} (\text{samples}))$
$\mu$ -law CODEC encoding	$\text{array1} = \text{mucode} (\text{array2})$
$\mu$ -law CODEC decoding	$\text{array1} = \text{mudec} (\text{array2})$
A-law CODEC encoding	$\text{array1} = \text{acode} (\text{array2})$
A-law CODEC decoding	$\text{array1} = \text{adec} (\text{array2})$
Normalized correlation	$I = \text{correlation} (\text{samples}_1, \text{samples}_2)$