Space Vector Modulation

This simulation shows an example of the Space Vector Modulation technique used with InstaSPIN-FOC. There are two advantages of this technique:

1. No waveform LUT is required. All calculations are performed "in-place" with no waveform history required.

2. The technique supports a gentle and natural transition into the overmodulation range. At a modulation index of 1.33, the waveform has completely transitioned into a trapezoidal waveform.

The waveform shape is that of the alternating null reverse sequence technique (which is the most popular SVM algorithm). It is very similar to 3rd Harmonic Modulation except the common-mode injected signal is a 3rd-harmonic triangle wave instead of a 3rd-harmonic sinewave. As with 3rd-Harmonic modulation, the modulation index can be >15% higher than with sinusoidal modulation alone, and still produce sinusoidal currents.

TRANSIENTS: At t=0, three center-aligned PWMs with f=250 Hz, m=1.154 are applied to a motor which is already spinning at 250 Hz..

PLOTS: Phase currents, sampled phase currents from dual shunts, modulation input waveforms.

REQUIREMENTS: Spice Executable, Support Pack

Unzip the files for this simulation into the same folder as the files extracted from the Support Pack. Then run "08 Space Vector Modulation.asc".