

PROBLEM:

In the rotating disk and strobe demo described in Chapter 4 of *SP-First*, we observed that different flashing rates of the strobe light would make the spot on the disk stand still.

- Assume that the disk is rotating in the counter-clockwise direction at a constant speed of 600 rpm (revolutions per minute). Express the movement of the spot on the disk as a rotating complex phasor.
- If the strobe light can be flashed at a rate of n flashes *per second* where n is an integer greater than zero, determine all possible flashing rates such that the disk can be made to stand still.
NOTE: the only possible flashing rates are integers: 1 per second, 2 per second, 3 per second, etc.
- If the flashing rate is 9 times per second, explain how the spot will move and write a complex phasor that gives the position of the spot at each flash.
- Draw a spectrum plot of the discrete-time signal in part (c) to explain your answer.