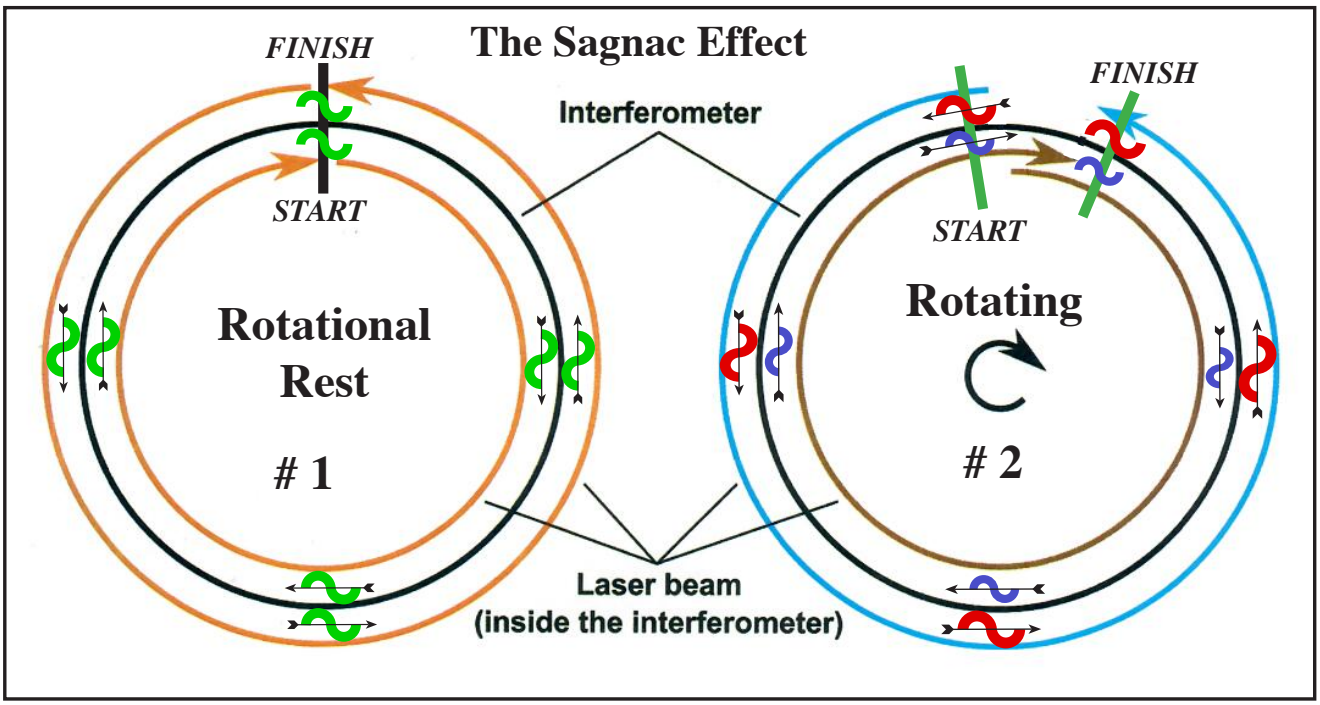
The Sagnac Effect Has Been Used With Different Explanations to Prove Einstein's Theories Wrong and at Other Times to Prove Them Correct



In drawing #1, green un-shifted photons travel in opposite directions on a circular path around the stationary interferometer. They meet at the point where they started and they exhibit no fringe shift when measured.

In drawing #2, the circular path is rotating to the right (clockwise). The photons emitted in the direction of the motion are blue shifted and gain momentum from the apparatus and the photons emitted against the motion are red shifted and lose momentum to the apparatus . Both sets of photons move at exactly c in opposite directions. Because their paths are rotating, they do not meet until the blue photons have made more than one revolution and the red photons have made less than a revolution. The exact rotation of the interferometer can be measured as fringe shifts between the red and blue photons. They both move at exactly c and travel the same distance in the same time but the blue photons are perceived to move faster than the red photons relative to the Sagnac apparatus.

The Sagnac Effect is somewhat unique among scientific experiments because it has been claimed at one time or another to both verify and falsify Special Relativity, General Relativity, and several aether theories. These theories offer different and somewhat contradictory explanations of this effect. However, none of these metaphysical assumptions are necessary because the Sagnac Effect is based on a simple principle of measurement that requires no theory to explain. The constant speed of light in the ***Zero Momentum Rest*** frame is a principle of measurement and not a theory.

All photons are measured to move at exactly c through the same imaginary* ZMR *frame of empty space. Their velocity relative to an observer is always c plus or minus v and is precisely measured as red or blue Doppler shifts in photon momentum and wavelength.

In linear measurements, Doppler shifts cannot be physically separated from a photon's actual dimensions but with the circular motion of the Sagnac interferometer, the complementary absolute red and blue shifts are equal and can be precisely measured as fringe shifts to quantify rotary motion and conserve angular momentum.