

Abstract Submitted
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Studying the Transfer of Optical Orbital Angular Momentum to a Helical Bacterium DANA DAVIS, TIMOTHY HORTON, STEVEN REICHMAN, JUSTIN LINK, HEIDRUN SCHMITZER, Xavier University, Department of Physics, JENNIFER ROBBINS, DOROTHY ENGLE, Xavier University, Department of Biology — The purpose of this research is to study how the angular momentum of an optical vortex created by a 1064 nm laser is transferred to a helical shaped bacterium. When under the influence of a laser in optical tweezers, the helical shape of the bacteria causes it to spin in the trap. A spatial light modulator reshapes the beam and is twisted either into a left handed or right handed helix. This results in an optical vortex with a diameter which can be adjusted from roughly half a micron to three microns. The rotational speed of a helical bacterium in this type of optical trap should depend on the handedness of the vortex and the handedness of the bacterium being tweezed. When both the tweezing beam and the bacterium have the same handedness, a slight reduction in rotational speed should be observed; when the tweezing beam has the opposite handedness of the bacterium, a slight increase in rotational speed should be expected. We present our first experiments with *magnetospirillum magnetotacticum* and *rhodospirillum rubrum*.

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