

Abstract Submitted
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An application of fast response Polarized Light Microscopy DEEP-
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University and MARTECH — A fast response polarized light microscope was de-
signed based on the algorithm by Shribak et. al (Applied Optics, vol. 42, 3009-3017).
A pulsed laser beam was passed through two Pockels cells aligned at different angles
with respect to optical axis. The retardance of the Pockels cell was controlled by
external switches and power supplies. The electronics circuit in the system allows
change of the retardance of the Pockels cell each millisecond for four milliseconds.
In four milliseconds, four images of a birefringent sample, formed by different states
of polarized light are recorded. The images are added appropriately to calculate
retardance amplitude and phase by using codes written in imageJ software. The mi-
croscope was used to show the retardance and phase of a rabbit muscle fiber. Record-
ings were also taken of the contraction of *Vorticella convallaria* but the changes were
too fast to yield retardance images. This type of microscope can be used to study
different kinds of biological functions that change on a timescale slower than four
milliseconds but faster than two seconds.

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