

Assignment 7

1. Mica is commonly used for waveplates. Its indices of refraction for extraordinary and ordinary rays are 1.599 and 1.594 for yellow light. What is the minimum thickness of mica for
 - a) $\lambda/2$ plate
 - b) $\lambda/4$ plate
2. Waveplates
 - a) Show how a waveplate can rotate the polarization axis of linearly polarized light.
 - b) Show how a quarter waveplate converts linearly polarized light into circularly polarized light.
3. What voltage is required to rotate linearly polarized light by 90° if green light passes through a KDP Pockels Cell?
4. Calculate the magnetic field needed to use the Faraday Effect to rotate the axis of linear polarized light 90° when it passes through 1 cm of quartz. How does this compare to the Earth's magnetic field?
5. Acousto/Electro-Optic Modulators
 - a) What are the differences in the light produced by acousto and electro-optic modulators?
 - b) When would one modulator be more useful?