POLARIZATION CONTROL AND CRYSTAL OPTICS

Summary of Measurements

1. Observation of polarization phenomena (45 minutes)
   - polarization of scattered light from the blue sky
   - polarization of reflected light from dielectric surfaces
   - reflection of light at the Brewster angle; precise establishment of known states of polarization

2. Production and measurement of various states of polarization (75 minutes)
   - production and measurement of elliptically polarized light using wave plates
   - relative phase shift of linearly polarized light upon external reflection from dielectric surfaces
   - relative phase shift of linearly polarized light upon reflection from metal mirrors

3. Polarizing components and systems (60 minutes)
   - extinction ratio of crossed polarizers
   - construction of a 90° polarization rotator using wave plates

4. Total internal reflection (90 minutes)
   - measurement of the relative phase shift of reflected light upon sub-critical and super-critical (i.e. total) internal reflection

5. Birefringence of sapphire (90 minutes)
   - observation of birefringence in sapphire
   - measurement of the orientation of the crystal c-axis in a sapphire plate