

Use of interference colours to distinguish between fast and slow axes of a quarter wave plate

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### **Abstract**

A quarter wave plate is commonly used to generate circularly and elliptically polarized light owing to its birefringent property. The orientation of its fast and slow axes with respect to linearly polarized light decides the resultant polarization. Often, low-priced wave plates do not come with their fast and slow axes marked. Users are supposed to conduct a test based on colour changes as seen while tilting the quarter wave plate and assigning the respective axes. Although this procedure is routinely advised, the physics behind the typically observed colours is seldom discussed in the literature. The present article is structured as a tutorial to understand the origin of observed interference colours while a quarter wave plate is tilted about its fast or slow axes. The explanation is given on the basis of the Michel Levy interference colour chart. At the same time, the tutorial is intended to introduce new researchers from multidisciplinary fields like physics, geology, mineralogy and chemistry to basics pertaining to birefringence in a comprehensive way as they are not taught in disciplinary college/university curricula otherwise.

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