A SIMPLE GUIDE TO INTERFERENCE FIGURES

This short guide does not deal in any way with the theory behind interference figures, but should enable you to:

• Get a good interference figure
• Distinguish uniaxial and biaxial figures
• Determine optic sign
• Estimate the property known as 2V

Producing an optic-axis interference figure
• Choose a grain showing the lowest interference colors that you can find for the particular mineral you're interested in
• Move to the high-powered objective lens, refocus, and make sure that the grain you want fills the centre of the field of view, and stays there as you rotate the stage.
• Open the sub-stage diaphragm as wide as possible, and cross the polars
• Insert the condenser lens
• Insert the Bertrand Lens (or remove the eyepiece)
• Bingo!

Interpreting optic-axis figures
The interference figure will consist of one or more black straight or curved lines (called isogyres) on a light or colored background. There are two main types of figure:

UNIAXIAL figures:
Ideally you will see a black cross with "arms" (isogyres) pointing N-S and E-W. If the cross is not perfectly centred with the crosshairs, the centre of the cross will rotate as you rotate the stage, but the arms will always be N-S and E-W. As you rotate the stage, successive quadrants of the cross will move into the field of view.

BIAXIAL figures:
Ideally you will see one or more curved isogyres. The degree of curvature will vary from almost a right-angle bend, to a straight line. As you rotate the stage the direction of curvature on the isogyre will change.
**Determining optic sign**

- Rotate the stage until either: (a) You can clearly see NE quadrant of the cross (if a uniaxial figure), or (b) You can see a curved biaxial isogyre running from NW to SE, and concave to the NE.
- Insert the sensitive tint plate (ensuring that it is set length slow, with the plus signs along its length)
- Any isogyres you can see will go purple. Look closely for any color changes in the NE quadrant of the cross (or to the NE of any curved isogyre aligned as above). BLUE means that the mineral is optically positive, YELLOW that the mineral is optically negative.

This assumes that your microscope has an accessory slot running SW-NE, and that your tint plate is length slow. If your microscope has a SE-NW slot, the signs given above will be reversed (i.e., blue - negative, yellow - positive). If you are in doubt about the orientation of your microscope or tint plate, find a grain of quartz (e.g., in a granite or sandstone slide) showing dark grey birefringence colors. Then, obtain a figure as described in (1) above and insert the tint plate. This will show you the distribution of colors for an optically +ve mineral. You will sometimes find that other users of your microscope have deliberately (or otherwise) fiddled with the orientation of your sensitive tint plate, so it's a good idea to check if in doubt.

**Estimating 2V**

2V is defined as the angle between the two optic axes of a biaxial figure. Rather than worry about what this means, we will concentrate on estimating its value from interference figures - you can use this as a diagnostic test without needing to understand it. There are various ways to estimate 2V - here we will only use the OPTIC AXIS FIGURE (produced by the procedure above)

\[ 2V = 0^\circ \text{ (uniaxial)} \]

You see a black cross

\[ 2V=\text{low (1-30)} \]

You see one, or more probably two, very strongly curved isogyres, which may resemble a uniaxial cross, but on close examination the cross breaks up into 2 curved lines as the stage is rotated.

\[ 2V=\text{medium (30-70)} \]

You see a noticeably curved isogyre. As you rotate the stage, the direction in which the curve is concave will vary.

\[ 2V=\text{high (70-90)} \]

You see a single isogyre which is only slightly curved, or, if 2V is 90 degrees, straight. As you rotate the stage, the direction in which the curve is concave will vary, although this may be barely perceptible. A straight biaxial isogyre, unlike a uniaxial one, will not always be parallel to one or other of the crosshairs.