Moving arm for ND Filters

General description

The basic plan is to hold the ND filters in the air between the microscope lens and the sensor. There will be an arm that extends out from the platen (metal platform around the sensor that the probe card holder sits on). The arm will have a disc on the end of it with holes for each of the 6 ND filters as well as an empty one for “no filter”. The disc, or wheel, will rotate to select a particular filter. The arm will be able to rotate around its other end, and the wheel will be able to slide longitudinally along the length of the arm as a way of positioning the filter around various parts of the sensor. The wheel will have a single face plate that holds all the filters in place. See the cartoons on the next slides.

The arm will have tick marks for both its rotation and the longitudinal position of the wheel on it, and the disc will have marks for its own rotation. That way, the positioning of the arm can be recorded and reproduced. It’s not clear yet how much precision can be attained this way, but it will allow for some attempt at reproducibility.
Moving arm for ND Filters

Top View
- Track for sliding the wheel
- Loosen nut to rotate arm
- Loosen nut to rotate/slide wheel

Side View
- Wheel faceplate

Filter Wheel Cross-section
- ND Filter Glass
Moving arm for ND Filters

Marks for longitudinal position of wheel using the edge of the wheel as a pointer.

Marks for arm rotation can be placed on a separate piece (like a giant washer) that will screw down between the platen and the arm.

Marks for wheel rotation will be placed around the edge of the wheel and use the intersection of the wheel and the horizontal arm as a pointer.
The filter wheel arm will extend out from the platen over the sensor, below the microscope.
Since making the simple cartoon on the previous slides it’s become clear that there is very little vertical clearance between the top of the platen and the bottom of the microscope lens. So the design does not need to change much other than the have a couple of right angle bends in the arm that will lower the height of the filter wheel such that it can clear both the bottom of the microscope lens and the top of the sensor/probe card assembly.