HIGH RESOLUTION FIELD EMISSION
SCANNING ELECTRON MICROSCOPE: HITACHI S-4800

BEAM ALIGNMENT PROCEDURE

1. Set \( V_{\text{acc}} \) and \( I_e \) to desired value.

2. Move stage to desired working distance with \( Z \) manual knob on sample chamber. The distance is in mm; this is the distance between the pole piece and the sample surface.

3. Under the SEM tab in the software interface, set WD (working distance).

4. Select focus mode UHR.

5. Press F2 on the keyboard while the cursor is over the view window to degauss the objective lens. This should be done every time focus is greatly changed (by changing working distance), or \( V_{\text{acc}} \) or \( I_e \) are changed.

6. Adjust FOCUS/BRIGHTNESS/CONTRAST knobs to obtain the best image possible.

7. Check that \( I_e \) has not dropped from selected value. If it has, press SET.

8. Click Align button along top row of screen to open align dialog box.

   Note: In general you want to align the beam at twice the magnification that you will be using for your images.

9. Align beam:
   a. Click the Beam Align radio button.
   b. Adjust BRIGHTNESS/CONTRAST knobs to obtain a clear disc. Use STIGMA/ALIGNMENT knobs X and Y to center disc on the target.

10. Align aperture:
    a. Click the Aperture Align radio button.
    b. Use STIGMA/ALIGNMENT knobs X and Y to minimize motion in image.

11. Align Stigma Align.X and Stigma Align.Y:
    a. Click the Stigma Align.X radio button.
    b. Use STIGMA/ALIGNMENT knobs X and Y to minimize motion in image.
    c. Repeat for Stigma Align.Y radio button.

12. Select Off radio button to turn off alignment functions.
13. Adjust **FOCUS** knobs for best image.

14. Correct lens astigmatism by adjusting **STIGMA/ALIGNMENT** knobs X and Y knobs for best image.

    When the astigmatism is out of adjustment, the image will be “smeared”. Round objects will appear oblong. Adjust **STIGMA/ALIGNMENT** knobs X and Y so that this “smearing” is minimized.

15. Repeat (14) and (15) until best image is obtained.

16. In some cases the initial focusing done in (7) would not have produced a quality image suitable for the alignment in (9) to (13). If this was the case, after (16) go back to (9) and repeat the process.