

## 4. Optimizing the Process (FOCUS and/or EXPOSURE matrix)

The system is calibrated weekly on 4 inch Si wafers using the standard chuck (4"-500um). Your substrate type, thickness, and resist may require different focus and exposure setting than the standard calibration.

A focus-exposure optimization should be done for each resist, to tweak your process relative to the calibration baseline. You can use one of your already defined jobs\passes with your highest resolution mask to optimize the process.

The command **EXPO** will shoot a specified serpentine array based on the parameters in your job\pass. The focus and/or exposure can be **varied across** this array to determine the optimum focus relative to the baseline. **One focus step is equal to 0.1 um of focus depth. FOCUS OFFSET is an INTEGER!**

**+1=0.1um of lens movement up from the wafer**

**-1=0.1um of lens movement down toward the wafer**

1. Before doing an EXPO job, type the "CHUCK" – set the chuck size that is correct for your substrate (4" wafer-would be 100)
2. Use the command **EXPO jobname\passname** and hit enter
3. Enter starting row within array specified in the pass (for example : 1)
4. Enter ending row within the array specified in the pass (for example:6, depending how big is die size, and how many dies can fit in X direction)
5. Enter starting column within array specified in the pass (for example:1)
6. Enter ending column within the array specified in the pass(for example:6)
7. Enter either **F=to vary the focus** , or **E= to vary the exposure** , or **R for both** (to increment **focus** for each row **and exposure** for each column within the array)
8. Enter the parameters as prompted by the computer. They will differ based on which option is chosen
9. "Start AWH" process – press MANUAL when prompted
10. Press the MANUAL again
11. If you are doing an aligned test (like for exposure on top of a mesa) align the wafer now, press "EXPOSE"
12. If you are NOT doing an aligned test, just press "EXPOSE"
13. When done, do PEB, and development according to the process and inspect in the microscope. Please take your time for inspection.
14. The computer will ask you for the best row and column. Enter row and column number
15. The computer will then tell you the focus and exposure based on the row and column you input
16. **Do not update system focus!** Input a focus offset into your own exposure job. (If you update the system focus, you must change it back using the MODE command)
17. Unload the mask plate, and LOG OUT